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1957

1957 BRITANNICA BOOK OF THE YEAR



A Record of the March of Events of 1956

BRITANNICA **BOOK OF THE YEAR**
1957

Prepared under the Editorial Direction of

WALTER YUST

Editor of Encyclopædia Britannica

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BRITANNICA BOOK OF THE YEAR

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INTRODUCTION

THIS year's issue of the *Britannica Book of the Year* is the twentieth. For two decades—a period characterized throughout most of the world by coercions rather than by freedom—the book has been a popular annual whose area of distribution in the western hemisphere grows ever wider from year to year. Other countries need such books, as freely distributed, but the world's tyrannies do not encourage this. In the past year, however, there is striking evidence in Europe that at long last our modern version of tyranny may see its doom. Certainly the world can be at peace only when human dignity is respected and communication is free.

* * * * *

Two feature articles appear in the green section.

The growing concern about fresh-water supplies of the United States is discussed by Roscoe Fleming in "The Problem of Water." Fleming warns that this vital natural resource is limited in supply, and that the nation's future development may depend in no small measure on what we are now doing to conserve water and to develop additional sources of it. Fleming is a free-lance writer of Denver, Colo., centre of a region which has a critical water problem.

On July 4, 1946, a new Republic of the Philippines started its free and independent course with the assistance and blessings of the United States. In the second feature article, Albert Ravenholt reviews the history of the Filipino people and their land; tells of their achievements during the decade under their own leadership; and shows how democracy has fared in this region of Asia and the Pacific where live the world's great majority of awakening and uncommitted peoples. Ravenholt is a correspondent for the *Chicago Daily News* foreign service and an associate of the American Universities Field Staff, under whose auspices he is lecturing at leading educational institutions on the result of his intensive studies in the Philippines.

* * * * *

The current *Book of the Year*, as always, was made possible not only by its 600 and more authoritative contributors but by the fine co-operation of that portion of the permanent Editorial Staff which bears the burden of *Book of the Year* production.

Subeditors who checked for accuracy and prepared copy for the printer were: Judy Booth, Betty Cushman, Daphne Daume, Ruth Passin, Noreen Pine, Kathleen Ray, Helen Sund, Florence Williams and Marjorie E. Witte.

Others active in the work were indexers: Mildred W. Benson, Margaret Greenlee, Frances Latham, Janet Smith and Joan Stephenson; the Copy Control section which directs flow of copy to and from the editors, indexers and the printer: Félicité Buhl, Muriel Clarkson, Mary K. Finley, Grace Lord and Sally Recupido; Marianne Tamura, who, assisted by Catherine M. Cahill, Bernadette Rakers and Marie Reznick, prepared correspondence with contributors; Joan Bayliss and Carol Davis, who helped lay out the pages of the volume; general editorial assistants Russell Mahood and Edward Schulz; the geographer Ruth Martin; map and chart makers, Victor Figueroa, Theodore Jung, Jr., and Jobie Sayler; librarian, Adelaide Moen; typists, Ruth Bicking, Marie Chiaro, Irene Martinic and Florence Samuelson.

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The Problem of

WATER

Increasing demands
on a vital United States resource
call for a new national policy

By ROSCOE FLEMING



“THE United States can no longer treat water as an inexhaustible resource, and allow it to run a wayward and wasteful course to the sea.”—Wilbur N. Brucker, U.S. Secretary of the Army, at the dedication of the Gavins Point Dam, South Dakota, in 1955.

Not too far from where Secretary Brucker spoke, a steamboat many years ago was feeling its way up the Missouri River at low water, sometimes scraping the bottom. The pilot saw a homesteader come yawning out of his cabin on the bank and dip up a bucketful of water. Shaking his fist out the wheelhouse window, the pilot yelled, “Put that back!”

The United States is now at the “Put that back!” stage with respect to a natural resource which, next to the air itself, is basic to human life and civilization. All projections of increasing national production, consumption and prosperity should be prefaced by the stipulation “If there is enough water available.” The nation is at the end of one era, that of plentiful water, cheaply obtainable and pure enough for use without elaborate treatment, and at the beginning of another era, when the people must pay more for water, use it more thriftily, guard it more vigilantly against waste and pollution and spend more money on research and in developing new sources. As President Dwight D. Eisen-

hower said in naming his Advisory Committee on Water Resources Policy in 1955, “If we are to continue to advance agriculturally and industrially, we must make the best use of every drop of water which falls on our soil, or can be extracted from the oceans.”

It should be noted, however, that the country is not “running out of water” in the physical sense. No gigantic drought impends. Over a span of years the supply from the skies remains constant, within a few per cent, of a national average of 30 in. yearly. And of the 30% of this that constitutes the available water supply—that which does not return to the atmosphere at once, but remains within reach long enough for us to make fruitful use of it—we still consume only about 1 gal. out of each 6 or 7, or 200,000,000,000 gal. daily, nation-wide, out of an average daily supply of 1,300,000,000,000 gal.

This article is concerned primarily with the supply of water for consumptive purposes, such as domestic use, or for irrigation and industry. Such functions of water as providing electric power, or for navigation, which in themselves leave it essentially unchanged and fit for consumption, enter into the discussion only secondarily.

Closing of the Water Frontier

Just as the era of free land closed in the United States sometime before 1900, with vast economic, political and social consequences, so sometime after 1900 the American water frontier closed, with consequences which were perhaps as formidable and irreversible as those which followed the closing of the land frontier.

Only recently have most Americans come to realize that their country is faced with problems of water supply. In the early days,

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the wave of immigrants that flowed from the humid climate of western Europe to the similar environment of eastern North America continued as a matter of course to regard water as bountiful and never failing in supply, and they pressed on with scarcely a pause to the humid climate of the Pacific coast. They overleaped on the way that wild, dry hinterland of the west of which Daniel Webster once asked, "What do we want with this region . . . of shifting sands and whirlwinds of dust . . . of great deserts and endless mountain ranges?" But that region is now settled by millions of people. And in the process of that settlement there passed in review, as it were, the lessons the whole nation must now begin to learn—lessons learned by the inhabitants of the arid and subhumid west in the painful working out of a regional code of water law. From this may come eventually a closer national approach to the western system of water regulation, under which rights to water are generally recognized on the basis of "first come, first served" as long as the appropriator puts the water to beneficial use.

In brief, the day has passed when our use of fresh water can be expanded limitlessly. From now on the American community as a whole will be increasingly concerned with the husbanding, development and proper use of the nation's water supply. This presages, whether we may like it or not, an era of increasing governmental activity and supervision.

On every hand—from the housewife, from the farmer, from the industrialist, from officials of the burgeoning cities and suburbs, from conservationists, from government officials—come complaints and overtones of worry about water shortages. To attract prospective industries, many a community now boasts of its constant supply of pure fresh water, something which would have been taken for granted a generation ago. Huge expenditures are being made by many industrial plants to build large new

tanks and reservoirs to store their own water supplies. About one-fourth of all United States communities are chronically short of water and are under some sort of restriction or rationing. Only a minority of cities, such as some of those on the Great Lakes, collectively the earth's largest storage tank of fresh water, are free from worry over water.

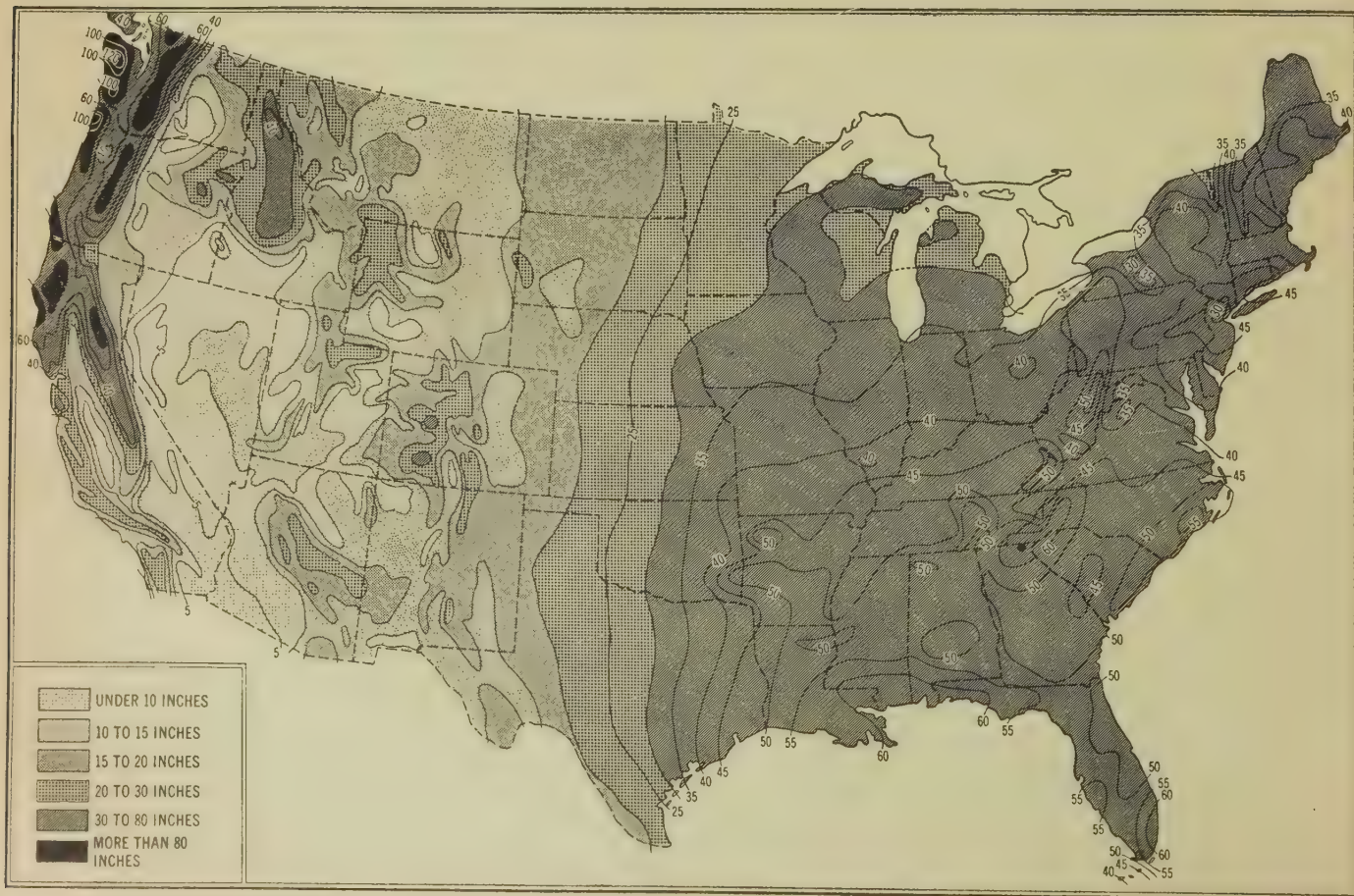
The Amount and Distribution of Precipitation

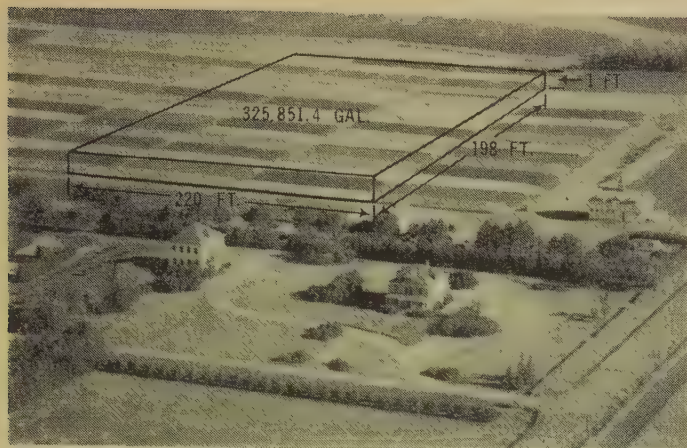
Yet, as has been said, the country's over-all supply remains roughly constant. Nature lifts from the salt seas, cleanses in her mighty evaporation machine and drops upon the face of the land about 5,000,000,000 ac.-ft. of water yearly, or about 4,300,000,000,000 gal. daily. (An acre-foot is that amount of water which would cover one acre one foot deep, or 325,851 gal. It is so convenient a unit for describing large quantities of water in numbers small enough to be comprehensible that it is used frequently throughout this article.)

Naturally, the supply varies from place to place and from time to time. If all the water that falls on the United States in an average year were to remain exactly where it fell, there would be pools on the northwestern coast more than 11 ft. deep, while at some southwestern points the depth of the water would be only a little more than one inch. East of the 98th meridian, water would lie from 30 to 60 in. deep, while west of that line it would measure from 25 in. down to less than 5 in., except on parts of the Pacific coast.

The country's supply of water is also unevenly distributed in time. In some areas a week without rain is regarded as the beginning of drought, while in others six months to a year without rain is a too-common experience. Most areas of the country experience periods of relative drought and relative plenty. Broadly speaking, the western half of the nation receives about one-third of the rainfall and the eastern half receives two-thirds. From the farming standpoint, the saving grace of midwestern precipitation

AVERAGE ANNUAL PRECIPITATION of the U.S., compiled from U.S. Weather Bureau data





AN ACRE-FOOT: The amount of water required to cover an area of one acre to a depth of one foot

is that a great deal of it falls during the crop season; but even so, the agricultural rule of thumb is that 20 in. or more of rainfall is necessary to produce unaided even the most water-thrifty crops. Hence the interior west is the land of irrigation farming, where water that falls on the mountains is stored in reservoirs and used to supplement natural rainfall.

The west in general is also the land of rivers smaller than their reputations. The Rio Grande, for example, which is so famous in song and story and whose very name means "Great River," actually discharges only about 1% of the flow of the Mississippi, and the Colorado River only about 3%.

This uneven distribution of the yearly precipitation is attributable largely to the location and direction of the two huge atmospheric rivers of water vapour that swirl across the United States: one from the Pacific Ocean, which tends somewhat northeast across the country, and one from the Gulf of Mexico and the Caribbean Sea, which typically streams northward and northeastward across the Gulf and southeastern coast lines and then is bent eastward in the mighty current of the westerlies. This broad picture of the atmospheric circulation accounts for both the well-watered east and the southwestern deserts, which lie in the angle between these two converging rivers of aerial moisture.

Of the 5,000,000,000 ac.-ft. of water that falls each year on the nation, about 70% is snatched back up into the atmosphere by evaporation or by transpiration from plants. From the purely physical standpoint, trees and vegetation are simply so many stationary pumps which pull water from the soil to release it as vapour into the atmosphere. Animals act in the same manner, performing the same functions, but are mobile. This is not a simple, one-time process. Tracer measurements conducted with tritium, the ultrarare isotope of hydrogen, by Willard F. Libby, formerly of The University of Chicago and now of the U.S. Atomic Energy Commission, indicate that some water coming inland over the Pacific coast may have fallen as rain and risen into the air again several times before falling at Chicago.

Man's Use and Abuse of Water and the Land

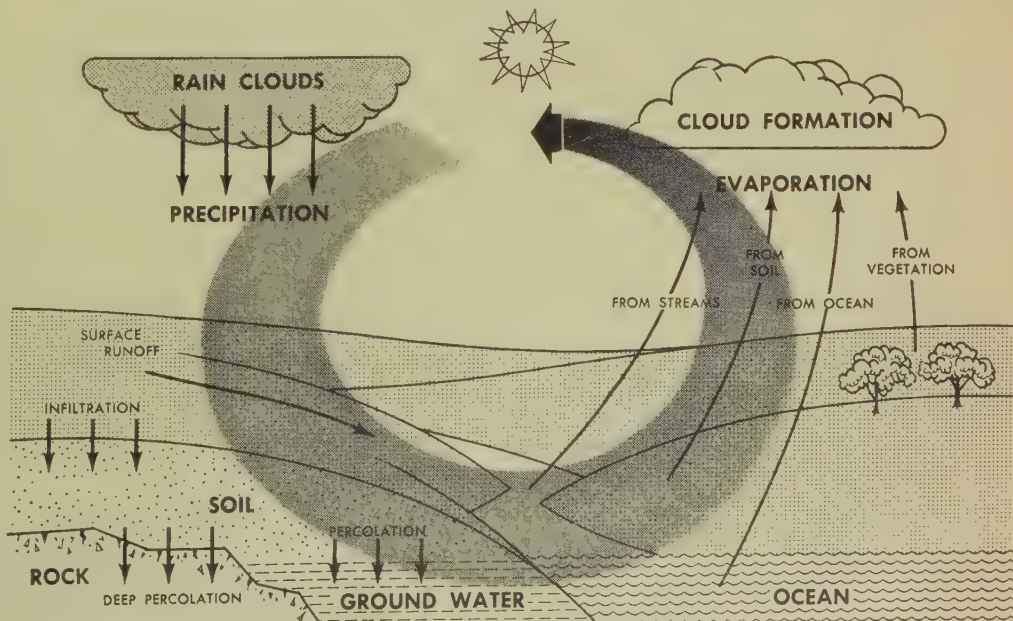
Of the water that falls, about 30% remains on or under the surface. It collects in rivers and lakes and in the earth's sponge-like crust, which holds more fresh water than all the surface collections combined. This 30% constitutes the supply for man's major use. It is not the drying up of the supply, therefore—save in local situations—that is of so much concern as the inordinate multiplication and expansion of the use of water by man. Not that he began that way. Anthropologists say that man once used water for little other than drinking purposes; from that point his use of it has increased until, in the most complex and luxurious civilization of all time, that of the United States, each person now requires daily on his individual account, though not for direct personal use, an average of about 1,200 gal. or five tons of water, much more than the people of any other country.

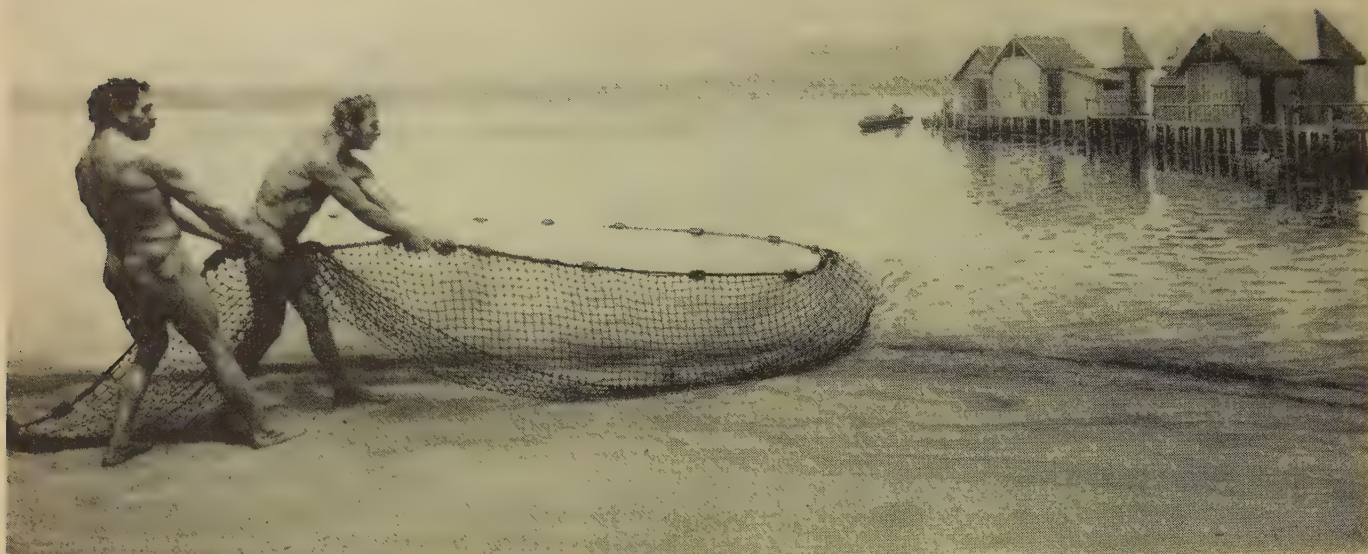
The ideal environment for man is a well-watered region between the polar zones of perpetual frost and the tropic zones of no frost. In such an environment human civilizations originated and spread, and in such regions the highest civilizations flourish today. Some specialists, such as Ellsworth Huntington, maintain that human movements and migrations have been dictated by climatic change as much as by the economic, social and political causes to which historians generally attribute them. In any event, among the country's most bitter internal quarrels are those over water, and water disputes furnish much provocation between nations, as today in the middle east.

The efforts of man to make water do his bidding probably began quite early, perhaps with the laying of a line of stones across a brook to guide the water up and over an area planted conveniently nearby. The evolution of that line of stones continued until it culminated in gigantic modern structures such as the Grand Coulee Dam.

Man's efforts to turn water into a "manageable crop" have been distinguished, first, by his dogged determination to cling to an area and seek to improve its water supply rather than to move away; and, second, by the fact that his efforts to coerce nature have often backfired. More than 4,000 years ago the Chinese were spreading water over thousands of acres of plains below their mountains; the Cretans of the same period had flush toilets. Two thousand years ago Roman engineers were bringing to the Imperial City 200,000,000 gal. of water daily, a supply sufficient

THE HYDROLOGIC CYCLE. Adapted from *Water, The 1955 Yearbook of Agriculture*, U.S. Department of Agriculture





SWISS LAKE DWELLERS, a Stone Age people, representing one of the earliest cultures to develop a largely water-based economy. Photograph from a diorama by Frederick Blaschke in the Chicago Natural History museum

for a large modern city, through aqueducts up to 60 mi. long. A thousand miles to the southeast, in that desert now called the Negev, Nabataean engineers were building check dams so skillfully as to provide a whole year's water supply for the people and their crops from a rainfall of only a few inches yearly which fell only during a few weeks in the spring.

Yet the impress of man's mistakes is engraved as deeply upon the face of the land as is that of his constructive achievements. Some 2,300 years ago Plato mourned the eroded desolation of Attica that had resulted from the destruction of its forests and other vegetation. Where the cedars of Lebanon once grew are now rutted hillsides. Much of the spreading desert around the Mediterranean is blamed on man's unthinking destruction of the forests and of other natural covers and binders of the soil surface.

But it is not necessary to go so far back to find a typical history of water use and abuse. Four centuries ago European immigrants began to rush into North America. They found a continent thinly inhabited by man but very little altered or harmed by his use of it, since the people were largely hunters and food gatherers rather than cultivators. The spongy floor of the vast forest that covered the eastern half of the continent was ideally suited to absorb water, filter it and slowly let it down into streams to find its way to the sea. The deep aboriginal sod of the prairies farther west accomplished much the same purpose. The continent was thickly inhabited with burrowing animals, down to the ubiquitous earthworm, and their burrows made channels through which water could percolate down from the surface; the beaver built small storage dams which also held back the water and let it down gradually.

In his headlong exploitation of the continent, man cleared the forests and tore up the sod for agriculture. The farmers made war on the larger wild animals, and the smaller ones were inadvertently destroyed. Overplowing and overgrazing have contributed to the deterioration of the land as a holder of water, and erosion and flash flooding have increased.

Then during our national lifetime more than 115,000,000 ac. of land have been withdrawn from rural uses to be occupied by cities, highway and railroad rights of way, defense establishments, mines, factories, airports, parks, etc. The U.S. Soil Conservation Service has found that this withdrawal is proceeding

even faster than in the past, with about 17,000,000 ac. withdrawn in the past 15 years. Much of this land has been hard-surfaced, which adds to the runoff problem; and some remote areas, such as those used for bombing or artillery ranges, have received even less conservation care than former owners gave them.

Erosion is still robbing the nation of the equivalent of 400,000 to 500,000 ac. of good topsoil annually, despite all soil conservation efforts of recent years. Erosion also increases the disastrous character of floods, particularly as people build more thickly along the watercourses, so that even the catastrophic floods of 1951 in the midwest and of 1955 in the midwest and California may be merely precursors of worse to come.

Erosion also fouls the water supply. Some streams that once ran clear, cool and slow, with relatively little difference between their highest and lowest stages, now boil with flash floods and at other times dwindle to trickles. Further, their water is freighted with mud, hundreds of millions of tons of it going to sea yearly, so that it is said that the Mississippi delta is being built of the farms of 30 states, and that at flood stage the Mis-

ROMAN AQUEDUCT, Segovia, Sp.



souri River carries two farms a minute past St. Louis. Besides representing the loss of rich soil, this silting requires expensive treatment to clear up the water again for human use, and the sediment then fills up the reservoirs that are built at so much expense to store or to control the water.

The Demand for Water Is Increasing

So far we have been able to obtain our water supplies at extremely low cost, simply because water moves itself downhill and we need only to intercept it. Indeed, it acquires so much energy on its way downhill that it can be made to turn water wheels and thus do work, as in generating electricity. Human settlements have been built either beside the moving waters themselves, the immemorial highways, or the waters have been brought to the cities and towns through canals and pipelines. The cost of supplying water to homes and factories can rise rapidly and steeply when it must be pumped uphill or when it must be rid of impurities which are unbearable by human bodies, plants and animals, or, lately, by machinery, which is in some respects the most finicky user of all.

The use of water is increasing much faster in the United States than is the population, as more uses are found for it. The Task Force on Water Resources of the second Commission on Organization of the Executive Branch of the Government (Hoover Commission) estimated that total U.S. consumption approximated 200,000,000,000 gal. daily in 1955, out of the total supply retained on the face of the land of 1,300,000,000,000 gal., and that by 1975 consumption may amount to 400,000,000,000 gal. daily.

The demands of the increasing human population are in themselves formidable. Approximately 170,000,000 Americans have to be supplied with food and drink, about ten pounds daily for each person, which in altered form must be eliminated. Each day there are 11,000 little newcomers squalling their demands for water and for goods which require water for their production; each day therefore sees a net national increase of about 7,500 persons, or enough to populate a typical county seat town.

For each meal set before an American family, at least a ton of water must have been used in growing, processing and preparing it. The quantity of water required for vegetable growth varies from 300 to 700 lb. for each pound of dry product. For example, raising a pound of wheat takes about 500 lb. of water, plus additional water at almost every stage of its con-

version into bread. One pound of sugar requires one ton of water to grow and prepare. Other constituents of our meals require water in varying proportion.

The population of the larger domestic animals—cattle, hogs, sheep and horses—outnumbers the human population in the United States by about 20,000,000, and the domestic animals must also be provided with water. One milk cow, for example, will drink from 60 to 180 lb. of water daily.

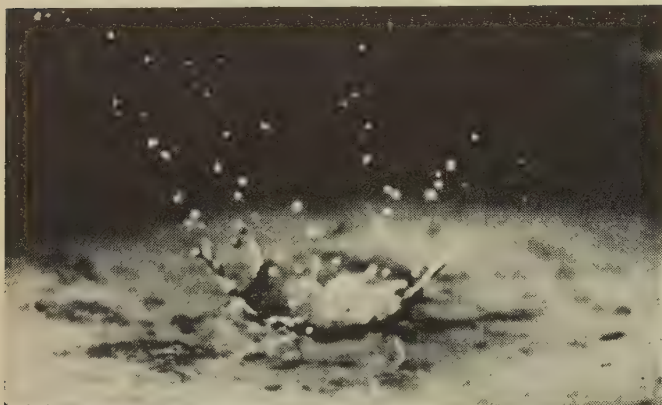
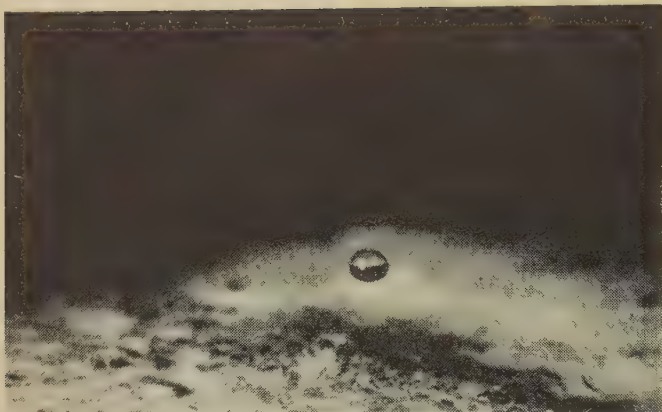
Americans scrub themselves more than any other people, use water more lavishly on their lawns and gardens, and in general never stint themselves except in desert communities—though even there may be seen pathetic little plots of land diked by sand in front of the houses, where a few sprigs of grass or a few flowers are nurtured by the patient housewife with waste water carried out by hand.

Not only do Americans take more baths, but they surround themselves with more and more water-using devices: farm ponds,

HOOVER DAM, Colorado River. Completed in 1936, this is the world's highest concrete arch-gravity type dam. It is 726 ft. high and 1,244 ft. long, and its volume is 4,400,000 cu.yd.



THE PROBLEM OF WATER



A SINGLE DROP OF RAIN and the amount of soil it can displace (above), a fundamental lesson in erosion. Left unchecked, the combination of rain, runoff and wind can quickly produce serious upland erosion such as is shown in the photograph below

backyard swimming pools, air coolers and air conditioners, dish-washing machines, home laundries and garbage disposal systems.

Such examples show both the need for increased water supplies and the changing aspects of the problem. The individual well and the backyard privy may still do for an isolated farm or a rough country place, but not for the enormous subdivisions into which the nation's cities and towns are exploding. Each new subdivision requires a central water supply and waste disposal system, which must ultimately be maintained by the community. The same is true with industry. The traditional builder of a factory once dug a well to provide water for it, or hitched onto the community supply pipes; or, locating on a stream, he began to take in its waters for cooling, cleansing or chemical purposes and to discharge them back into the stream at a lower point, often without so much as a by-your-leave, despite his obligation under riparian law to leave the waters unimpaired for the use of others.

But times have changed. The provision of water for a big new industrial plant is now always the subject of serious consultation among its owners and managers and the representatives of the community, and in an increasing number of cases it has become the determining factor in plant locations. Not for nothing is Charleston, S.C., extending as the fairest flower in the bouquet with which it seeks to attract northern industry its feat in diking off, close beside the sea, a fresh-water supply of 10,000,000 gal. daily!

And water has also become an important factor in government planning; for example, water supply or water power, or both, have determined the location of almost all the plants of the U.S. Atomic Energy Commission.

Water has on the whole remained so cheap as to spoil us. The average purchaser of a domestic water supply, country-wide, pays about five cents a ton, or one cent for 48 gal., and in some cities the cost is much lower. For example, in one large western





DUST STORM approaching Springfield, Colo., in the 1930s. A widespread program of careful cultivation might largely have prevented this carrying of Colorado topsoil hundreds of miles from the eroded fields

city, Denver, Colo., the householder can fill and empty the standard 30-gal. hot water tank in his cellar three times for a penny. Yet the water has been brought into his house through a gathering system which extends more than 100 mi. into the mountains and pierces the continental divide through a 6-mi. tunnel; it includes four large artificial mountain lakes, a purification plant, scores of miles of large mains and hundreds of miles of smaller ones. The capital value of this plant is \$85,000,000, its annual budget is \$11,000,000, and it employs about 700 persons directly, in addition to those employed by contractors on work they do for it. By any standard it is one of the larger industrial enterprises of its community.

This city, which is located on what was formerly a dry prairie, is perhaps a more lavish user of water than most. Its people use water unstintingly to keep alive their parks and trees, their gardens and lawns. Its total requirements are larger than those of a humid-region city, and average about one acre-foot per year per family; but that family gets all its domestic requirements at a total cost of \$30 to \$70 per year. Except during long droughts, there has historically been no rationing of water, but this idyllic situation is ending there as in hundreds of other communities throughout the nation, many in regions of more plentiful natural water supply.

In fact, the business of supplying potable water to a big city is so elaborate a process that the finished product might almost be said to be manufactured. For example, Minneapolis, Minn., gets its water from the Mississippi River, and the city's water supply engineers annually use 6,000,000 lb. of alum to remove colour and materials that will not dissolve, 18,000,000 lb. of lime to soften the water, 2,500,000 lb. of carbon dioxide to keep it soft, 700,000 lb. of chlorine to kill bacteria, 500,000 lb. of ammonium sulphate to keep the water pure until it reaches the household faucet, and 500,000 lb. of carbon to control taste and odour.

The Cost of Water

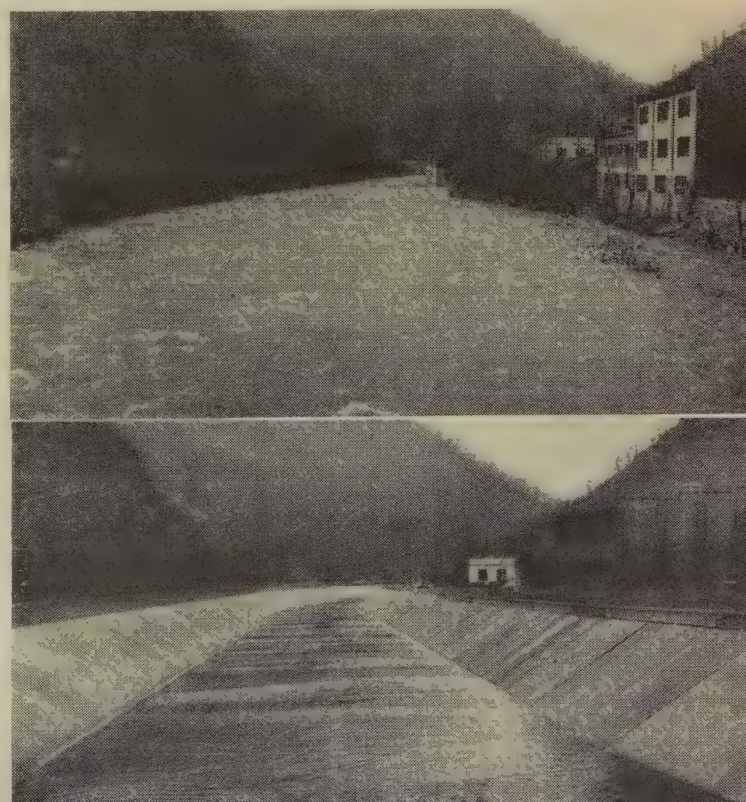
Considered as an industry in itself, the supplying of water throughout the United States was estimated even by 1950 to represent a capital investment of at least \$50,000,000,000 and an annual expenditure of more than \$3,000,000,000. The prospect is that both figures will at least double by 1975.

The cost of supplying water is rising rapidly partly because it has to be brought from farther away, as the nearer sources become overtaxed, and partly because the water supply has been

permitted to become contaminated, as in the case of numerous towns and cities which turn their untreated or only partially treated sewage into streams. This in turn compels downstream communities to install expensive treatment plants to make the water fit for drinking.

Estimates of the cost of water ignore very large amounts of money which are spent essentially on water but that are not reckoned as such. For example, the national forests have become increasingly valuable as sources of water for cities and farms which lie below them. One expert has estimated that more than 80% of the annual revenue value of the western forests now lies in their use as watersheds, as compared with that for timber production, grazing and recreation, all lumped together. This water value is rising steeply, too, as population rushes into the west. Another estimate is that even the barest boulder-strewn mountain-top in the Rockies is now worth \$50 or more an acre as a gatherer of water, or much more than unwatered prairie land

STREAM CONTROL AND FLOOD PROTECTION. Before and after views of a U.S. army corps of engineers project on a stream serving Cumberland, Md., and Ridgeley, W.Va. Stream bank erosion, threatening the railroad on the left and the buildings on the right, was eliminated



at the base of the mountains. Each acre above timber line yields an average of one acre-foot of water yearly. Yet expenditures of the U.S. Forest Service are not computed as for water supply.

In industry, many large corporations now have budgets for water supply alone that are comparable with the water budget of the city of Denver, both to ensure themselves of pure water and in many cases to make sure that their waste water does not pollute the community supply. Such private expenditures are increasing. Yet they are hidden in corporation accounts and do not figure in any public reckoning of the cost of water.

Industry the Biggest User

Most persons are accustomed to think of water only in terms of their direct personal use of it. But the vastly greater use of water is in ways that are out of sight of most persons and of which they do not often think. For example, Jack R. Barnes, formerly of the U.S. Geological Survey, estimated for the President's Materials Policy Commission of 1952 (the Paley Commission) that people were then directly using 17,000,000,000 gal. daily and would use 25,000,000,000 gal. daily by 1975. Yet in 1950 industry was estimated to consume 80,000,000,000 gal. daily, and irrigation was consuming 88,000,000,000 gal. daily of the national total daily consumption of about 200,000,000,000 gal. Direct domestic consumption was therefore less than one-tenth the total. By 1975, in Barnes's projection, industry would require 215,000,000,000 gal. daily and irrigation 110,000,000,000 gal., so that the daily domestic requirement of 25,000,000,000 gal. would then be only 7% of the total.

The most steeply rising curve of water use is by industry, particularly the chemically based industries, such as oil refining and the manufacture of synthetic materials such as plastics, rayon, nylon and the like. Papermaking alone consumed about 3,200,000,000 gal. daily in 1950 and 3,800,000,000 gal. daily in 1954. About 300 lb. of water goes into the making of a newspaper that weighs 1 lb., and in the process much of this water is polluted beyond immediate human use. Water is the most widely used industrial chemical. It serves as a raw material, a heat exchanger, a catalyst, a solvent, a binder. It must be available whenever and wherever needed and in condition suitable for use. Previously, and especially in the humid regions, industries needed to give little thought to the water supply; it was almost always adequate. Now the supply of water is often the foremost consideration. The

National Association of Manufacturers lays emphasis on its importance: "A shortage of water for industrial purposes—just as surely as a shortage of capital—could defeat our hopes for future growth and prosperity, and even imperil our national safety. No industry or business can long survive where water is unavailable or inadequate as to quantity or quality." And Barnes says that industry has an ever-increasing claim on water, as contrasted for example with the claim of agriculture; *i.e.*, a gallon of water used in industry is more valuable employed than a gallon of water used in agriculture.

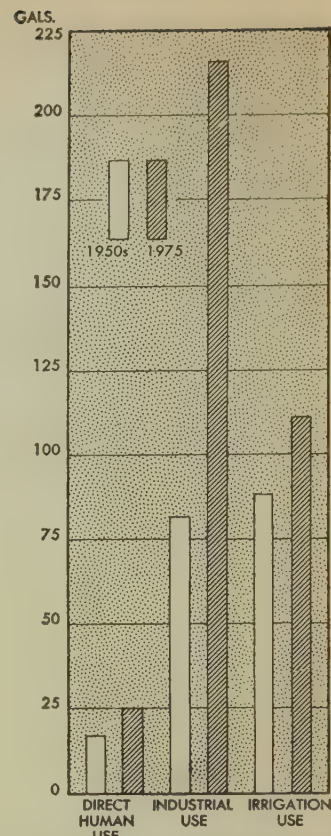
Each new type of industry seems to require greater quantities of water. The oil industry, largest in the country, requires tremendous amounts at every stage, from the oil well through the refinery to the automobile service station. When the liquid oil reserves of the country begin to fail and it becomes necessary to hydrogenize coal or distill oil from shale, these processes will require still more water. It is estimated, for example, that to establish a major extraction industry on the trillion-barrel shale reserves of the Rockies will require 300,000 ac.-ft. of water yearly. And any plans for turning coal into gasoline would also require locations where large fresh-water supplies are available.

Some new water-using industries are so far out of public sight that the public scarcely knows they exist. In the late 19th century a miner's wife in Australia noticed that flecks of galena and other ores clung to the bubbles of the suds in which she washed her husband's dirty work clothing. From this observation sprang the process known as froth flotation. Finely ground ores, or other substances, are channelled through huge washtubs in which small amounts of various chemicals are mixed with the continuously agitated water. The minerals to be removed or recovered cling to bubbles, which rise to the surface and are skimmed over the side. The process is now used to recover almost all nonferrous metals, and the drain on local water supplies is heavy. It is also used to prepare wheat for milling, to cleanse sesame seed and other farm products, to redeem coal dust for fuel, to reclaim used paper and for scores of similar purposes. The process can be reversed to cleanse polluted water and is being increasingly used for that purpose.

Water drafts are increasing in other ways. The fast-growing air-conditioning and air-cooling industry is largely based on the use of water. Much summer municipal consumption, particularly in the hotter parts of the U.S., is for this purpose.

Most Uses Speed Evaporation

Most uses of water are of a nature to increase evaporation. Evaporation is part of the inevitable penalty of storage. Even in the cooler parts of the country the evaporation from an exposed water surface runs from 30 to 36 in. yearly; in the hot, dry southwest it may run up to 100 in. or more. When water is allowed to stand in large shallow pools—and in cross section all pools are



DAILY WATER CONSUMPTION IN THE U.S. (In billions of gallons) in the 1950s, and the estimated figures for 1975

GALLONS OF WATER required to perform a variety of industrial services

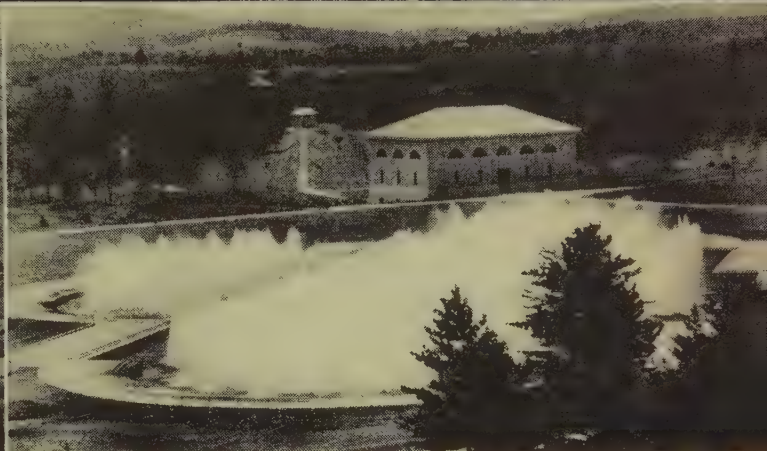
Make a ton of synthetic rubber	600,000
Brew a barrel of beer	470
Produce a ton of aluminum	320,000
Make a ton of smokeless powder	50,000
Can a case of lima beans	250
Generate a kilowatt-hour of electricity	6,000
Test an aeroplane engine	50,000
Produce a ton of bromine	5,000,000
Refine a barrel of petroleum	770
Make a ton of steel	65,000
Produce a ton of coke from coal	3,600
Make a ton of viscose rayon	200,000

METROPOLITAN WATER SUPPLIES

The photographs on this page illustrate some of the steps in the collection and purification of water to be used for direct human consumption in cities. In general these are the conditions for areas which depend directly upon rainwater—and runoff—as the supply source. For a slightly different situation, in which the city supply is derived by purification of river water, see page 18

Right: Typical mountain watershed, the Cedar River valley, Washington, source of the Seattle water supply. To prevent deterioration of their watersheds, cities maintain them by replanting trees and practising other conservation measures which preserve the terrain and control runoff

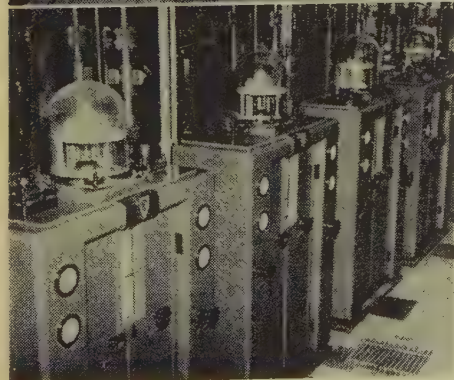
Below: Primary storage reservoir, a natural lake artificially diked by gravel shores, with a capacity of 3,660,000,000 gal. Storage reservoirs serve to collect runoff when precipitation is above normal (spring and fall) and maintain an even flow of water to other installations downstream throughout the year



Above: Aeration plant of the Ashokan reservoir, a major basin of the New York city supply. Water leaving the storage lakes receives here its first purification



Above: Additional cleansing takes place as the water approaches the city. Shown here is a view of the filtration galleries of the water system of Baltimore, Md. Insoluble products are removed as the water passes through sand, gravel and other screening materials



Left: Final sterilization of the water is usually accomplished through the addition of chemicals, chiefly chlorine. Machines such as those shown regulate the chlorination and indicate the degree of purity of the treated water

Right: Purified water is then pumped directly into the city mains or stored until needed in covered reservoirs or gravity pressure tanks like the one shown here



shallow—it is simply an invitation to the sun and atmosphere to come and get it. From the 160 sq.mi. of Lake Mead, for example, an estimated 800,000 ac.-ft. of water is lost yearly as vapour. This is not an argument against storage, for before Lake Mead was created the same amount of water now lost to the sky in a year would have run to waste in the Gulf of California in three weeks. But increasing evaporation is indubitably part of the price of storage. In all the projects of the Bureau of Reclamation the yearly loss to the atmosphere is estimated at about 2,000,000 ac.-ft., enough to irrigate up to 1,000,000 ac. of land, or to provide a domestic supply for a city larger than New York.

All over the United States, the needs of the people and the conservation policies of the government have created pools in increasing numbers—convenient evaporation tanks, in nature's view. The number of farm ponds, small irrigation reservoirs and small dams in watersheds, created with Soil Conservation Service assistance, totalled about 800,000 in 1956. Private ponds, and lakes created by and for other federal and governmental units, brought the grand total to 1,000,000 or more. At the end of 1956 there were an estimated 60,000 residential and community swimming pools, and others were being built at the rate of 30,000 yearly.

In short, there is no material aspect of American life, domestic, agricultural, industrial or commercial, that is not based upon storing and drawing larger and larger supplies of fresh water for increasingly larger and more diverse uses. However, all consumptive usage today amounts to only a little more than 1 in. of the 30 in. which nature bestows on the nation in an average year, or about 15% of the 1,300,000,000,000 gal. daily that remains long enough for man to use.

More Effective Management Needed

There are definite limits upon the annual amount of water which can effectively be converted to the use of man; upon the size of the "manageable water crop" which can be harvested even by the most enlightened management and by new techniques only now coming into sight. Yet such management can greatly increase the available supply, and according to J. R. Mahoney, senior natural resources technician for the Library of Congress:

A national program for increasing the quantity and improving the quality of products vital to human welfare can be achieved more effectively through water-management than by any other method. The undeveloped potentials are probably greater than for all other resources combined.

Waste Not, Want Not

The population of the United States is increasing its demands upon the available water supply at a rate greater than the population increase, but partly because of waste rather than of legitimate need. A chief cause of waste is pollution, since most of the water is either dirtied inadvertently or is deliberately used to dilute, dissolve and carry away impurities. If it were possible to clean up all the water so polluted, or to refrain from polluting it in the first place, most parts of the United States would be able to tap a larger "new" supply of pure water by this than by any other means.

First, there is waste due to siltation, which is in turn largely caused by past extravagant misuse of the soil. Such misuse is by no means ended, though it seems to be slowly diminishing as a result of wiser and thriftier policies of soil conservation. Siltation is one of the easier types of pollution to correct, since the particles will settle out if the water is held still long enough, unlike pollutants that dissolve in water and cannot be removed by gravity.

Then, in a fashion as free and easy as his misuse of the soil, man has got rid of waste, organic or industrial, by dumping it into the watercourses upon which he also depends for fresh water. This abuse has grown until public health authorities now characterize some of the major rivers as "sewers a thousand miles long."

Organic Pollution

So far as organic wastes are concerned, largely sewage, the national picture shows that there are 16,000 community water supply systems but only about 9,000 sewage disposal systems. This means that there are 7,000 communities of some size which have no sewage disposal or purification facilities whatsoever, beyond dumping the raw wastes into the community stream, well below town, of course, but above other communities which draw their drinking water from the same stream. The lower community usually complains of the pollution coming down the river, but often only adds the burden of its own refuse, and the process is repeated down the length of the stream. Further, of the sewage treatment plants that have been installed, many were inadequate to begin with, or have become so overloaded as the result of

RAW SEWAGE ENTERING A STREAM, posing a health problem for downstream communities





BIOLOGISTS SEINING A POOL to collect fish and smaller organisms in a U.S. Public Health Service project to determine the kinds of life which can exist in the three zones—septic, recovery and clean—of a contaminated stream

increasing populations that their contribution to the stream is little better than raw sewage.

The comfortable assertion with which communities sometimes salve their collective consciences rather than spend money on adequate sewage purification is that "running water purifies itself." It may do so in the course of many miles, when the burden of pollution is not overwhelming. But this is not true where a stream is overloaded with organic and chemical wastes, whether human, animal, industrial or those carried down with topsoil. Indispensable for aquatic animal life is the oxygen dissolved in the water—not the "O" of H_2O , but the elemental oxygen itself interspersed throughout the water. Decay of organic material is, however, an oxidizing process; that is, one of combination with oxygen. When a large quantity of sewage or other organic wastes is dumped into a stream it robs the water of its dissolved oxygen, perhaps for many miles, and fish and other aquatic animals are asphyxiated. All such life vanishes from the body of the stream. If this process is repeated at intervals along its course by successive use of the stream as a community sewer, it will eventually kill the whole living river.

One sad example of organic pollution is the Potomac River, around and below the nation's capital. Where fresh water meets incoming salt water and is slowed up, the former tends to drop its load. Health authorities discovered that the Potomac is so overloaded, largely with human wastes, that its estuary around Washington, D.C., is carpeted with such wastes over a large area to a depth of several feet. They are simply accumulating there, unchanged and uncleansed. Nothing can be done about this except to stop the pollution, which would require huge capital expenditures.

The plight of some inland cities is if anything worse. When the Ohio River is flowing at minimum stage, it is said that one quart of every gallon of water flowing through the faucets of Cincinnati has been through someone's toilet or kitchen sink upstream, or

through a mine dump or industrial plant. According to the U.S. Geological Survey, the present surface water withdrawals in the Ohio River basin at times of minimum flow of the river are greater than that flow.

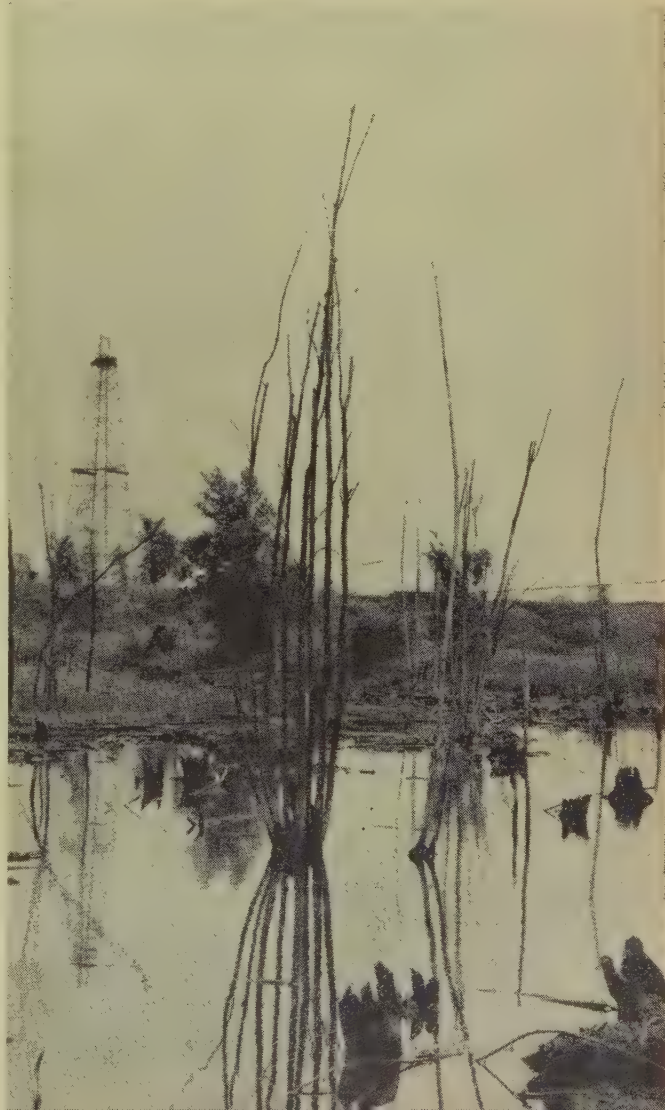
Such a water supply is naturally loaded with bacilli of many varieties. Although it can be rendered safe by chlorination, the fact remains that the city is put to extra expense to purify its water supply of the filth and dirt deposited by cities above; and this is repeated until the city farthest downstream gets the accumulated detritus of all those above it.

Nonorganic Pollution

A second cause of stream pollution is the dumping of industrial wastes, which may contain active poisons such as acids, alkalies, sulphur compounds, cyanide compounds, etc. The steel industry uses huge quantities of "pickling liquor," which is sulphuric acid, to eat the scale off newly rolled steel shapes. Formerly, after this became diluted and full of iron oxides, it was dumped into the nearest stream. Now, however, many steel mills reclaim this sulphuric acid and so have reduced pollution.

In mining areas the pollution may be compounded by waste water from the mines themselves, by runoff from their dumps and by waste from ore treatment plants. In some mining communities the floors of streams are covered for many miles with coal dust. In nonferrous mining, where ores must be ground as fine as talcum powder, these fine "tailings" formerly were dumped into the streams, where they not only killed aquatic life

KILLED VEGETATION resulting from brine which escaped from an oil well in Michigan

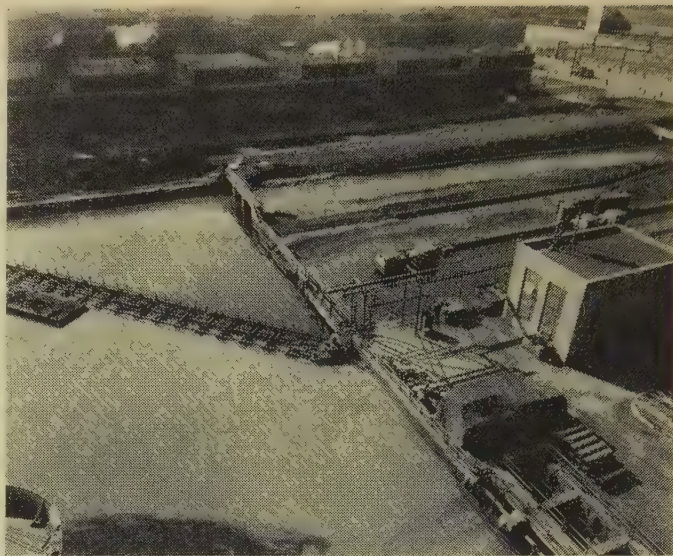


but also floated downstream and killed grassland and farm land by tightly sealing the surface of the soil. Protests from fishermen and farmers have largely ended such practices. Gold dredges have ruined many fine western valleys and streams. These machines simply turned the valley floor upside down, leaving it in windrows of boulders. Most such dredges are now inactive, however. Strip mining, as for coal, used to ruin many square miles of land, but most strip-mining companies now practise various methods for recovering the land.

A case history of the causes and effects of stream pollution is afforded by a recent study made on behalf of a western city of 16,000 persons, located upon a tributary of the Missouri River. An investigator discovered the following sources of pollution: A railroad tie-treating plant dumping carbolic acid wastes into the river; a railroad roundhouse dumping greasy and highly alkaline wastes; the state college stock farm dumping the untreated sewage of hundreds of animals; the overloaded local sewage plant dumping its product only partly treated; and many residences disposing of untreated sewage directly into the river. State game inspectors could find no fish in 50 mi. of the river below the town. All that is needed to round out the picture is a slaughterhouse and a vegetable-packing plant. It may seem incongruous to the housewife that fresh vegetable waste, such as she discards daily, or fresh animal offal, such as a packing plant must dispose of, are greater sources of water pollution, pound for pound, than is sewage. But the latter is already partly decomposed or oxidized, and therefore makes a lesser draft upon the free oxygen in the stream, while oxidation must proceed from the beginning in the case of fresher and less offensive wastes. Several cities have adopted new quick-composting processes which, with the aid of cultures of extraordinarily efficient bacteria, reduce garbage to usable topsoil within a few days, and thus relieve to some extent the pollution load.

New types of pollutants are constantly appearing. Sprays and insecticides of a deadliness unknown a decade ago are used by the farmer to fight pests. But many such sprays are definitely toxic to human beings as well as to the pests, and the effect of others is as yet unknown. The U.S. Food and Drug Administration consequently insists on thorough cleansing of fresh fruit and vegetables in interstate commerce, and state and local authorities follow up the precaution—but the wash water runs off into the community disposal system. Detergents, now used in greater quantity

CANAL DIVERSION PROJECT under construction in Florida. Completed control structure would permit regulation of floodwaters from the interior and prevent the intrusion of salt water from the Atlantic ocean



INDUSTRIAL POLLUTION CONTROL, a view of the water-treatment facilities of the River Rouge, Mich., plant of the Ford Motor company. Waste water from manufacturing enters at the right; before the water joins the main stream of the river the structure at left skims off the surface oil and screens out other insoluble products

than soap, sometimes make waste water foam as high as a man's head at turbulent spots on a stream below a city. New chemicals are continuously being introduced in industry, and these complicate the disposal problem. Some communities, in lieu of building expensive sewage treatment plants, simply acquire or build large ponds into which the sewage is run for oxidation before it enters the stream. Such ponds do oxidize it if not overloaded, but people downwind complain strenuously of the stench.

Heat may become a problem, altering and usually impoverishing the biological fitness of a river. The Hanford works of the Atomic Energy Commission at Hanford, Wash., for example, cast off enough heat to raise the temperature of the whole mighty Columbia River by one degree; and the waters of the Merrimac River in New England, bordered for many miles by industrial plants on both sides, get as hot as 110° F. during the summer.

Then there is the wholly new problem of atomic wastes so deadly to life that they must be carefully screened out and buried. At Hanford the Atomic Energy Commission has incongruously become a salmon tender and a shepherd, for it watches the effects upon these animals of effluent cooling water from the plant, to detect any possible leak of radioactive material into the river or into underground water supplies.

Redeeming Water

Even with all such considerations, however, most waste water is still less heavily laden with pollution, and thus more easily reclaimable, than is sea water, with its 3.5% burden of minerals. So the first and most obvious way to provide more usable water in many parts of the United States—apart from not polluting it in the first place—is to reclaim the waters that are laden with topsoil, those polluted by the sewage of cities and those carrying the wastes of factory installations.

If an appreciable fraction of the 200,000,000,000 gal. of water consumed daily in the United States could be reclaimed, it would also go far toward solving the immediate water problems of at least some communities. In the ideal situation each community, or each industrial installation, would take care of its own wastes and would release the water for the next user as clean and sweet as when it fell from the skies or flowed in clear mountain streams. If each city reclaimed its own waste water and recirculated it, its water supply problem would be limited to replacing the amount lost into the ground or through evaporation. But for

some reason Americans have a distaste for reusing their own waste water, so that this solution has to the writer's knowledge not been adopted by any water supply system in the country. This distaste apparently does not extend to reuse of the waste water of the next community upstream, or some Americans would become very thirsty.

The ideal of clearing all pollution at the source would be very expensive. The Task Force on Water Resources of the second Hoover Commission estimated that U.S. cities spent an average of \$145,000,000 yearly on sewage treatment plants for the four years 1950-53 inclusive; it added that no means were available of estimating the expenditures of industry for this purpose. As of 1955 the U.S. Public Health Service estimated that, merely to keep pace with increasing pollution, the nation's cities would have to spend an average of more than \$500,000,000 yearly for the succeeding ten years. In Aug. 1956 it was announced that New York city alone planned to spend \$225,000,000 in an endeavour to rid all its surrounding waters of pollution by 1964. The use of waste water as a new source of water supply, rather than letting it run down to the sea and be lost, depends largely therefore on the willingness of the taxpayer to pay the bill. The amended water pollution act passed by congress in 1956 authorized the federal government to grant 30% of the cost of approved local projects to abate pollution, but not more than \$250,000 to any one such project.

It also outlined procedures by which the U.S. Surgeon-General may proceed to abate continued pollution.

Saving Water

One obvious opportunity for saving water is before the point of use. Man's rivals for water are on the job every minute, striving to rob him of it. This begins even before it reaches the ground. Raindrops descending from the clouds into warmer, dryer air may evaporate at such a rate that they never reach the ground. "Virga," or rain that trails from a cloud but never reaches the land, is a common sight in dry regions, and a discouraging one. Once the water is on the ground, sun and atmosphere snatch at it greedily. Often this occurs while it is still in the form of snow. It sublimates, changing directly from the frozen to vapour form, without going through a liquid phase. The warm chinook winds of spring may take billions of tons of snow from the soil surface or directly from the branches of millions of acres of evergreen trees which have held it above the ground.

Once the water reaches the ground, useless plants may drink it. It is estimated that about half the water in the big irrigation reservoirs never reaches the roots of the farmer's plants, because of evaporation, seepage from the canals or ditches and the fierce thirst of water-loving vegetation useless to man. The proportion of loss may be less for domestic water, since its value is greater and community supply systems can afford to guard it better, but there is still loss.

Selective Cutting of Forest Trees

Most progress in water saving has naturally enough been made in dry regions. The U.S. Bureau of Reclamation and the U.S. Forest Service have devoted much attention to saving water. One of the programs of the latter agency, experimental so far but of great promise, tackles the problem of saving water from sublimating into the atmosphere while it is still in the form of snow. Deciduous trees shed their leaves and allow snow to reach the ground, but much of the evergreen forest of the Rockies is so thick that it forms a virtual roof over the earth. Upon this roof may lie as much as two feet of snow, much of which never reaches the ground but vanishes back into the atmosphere when the warm winds come.

At Fraser, Colo., high in the Rocky Mountains, the staff of the



STRIP CUTTING of a mountain forest near Fraser, Colo., a water-saving project of the U.S. Forest Service. The cleared areas permit snow to reach the ground which would otherwise remain on the trees until spring and then be returned by sublimation to the atmosphere, unavailable as water. The standing trees also cast enough shade to prevent evaporation losses in the spring, when the snow is melting and running off the slopes

U.S. Forest Service's Rocky Mountain Forest and Range Experiment Station of Fort Collins, Colo., has conducted a decade of experiments in selective cutting of the forest in various patterns to increase the proportion of snow that reaches the ground. The snow melts, thereby increasing the runoff. This selective cutting has two purposes: to open a space between the trees for the snow to fall into, yet to retain enough trees to shade the snow and prevent it from melting too early. The most efficient patterns for the purpose appear to be those which take out the trees in blocks or rows about as wide as the trees are tall.

Runoff has been increased by such means as much as 29%, which means an increased yield of at least several acre-inches from each acre. "Crop forestry," or selective cutting of mature trees, also increases the amount of snow which reaches the ground. But until water becomes more valuable, most of these techniques are too expensive to be practised for the sake of the water itself.

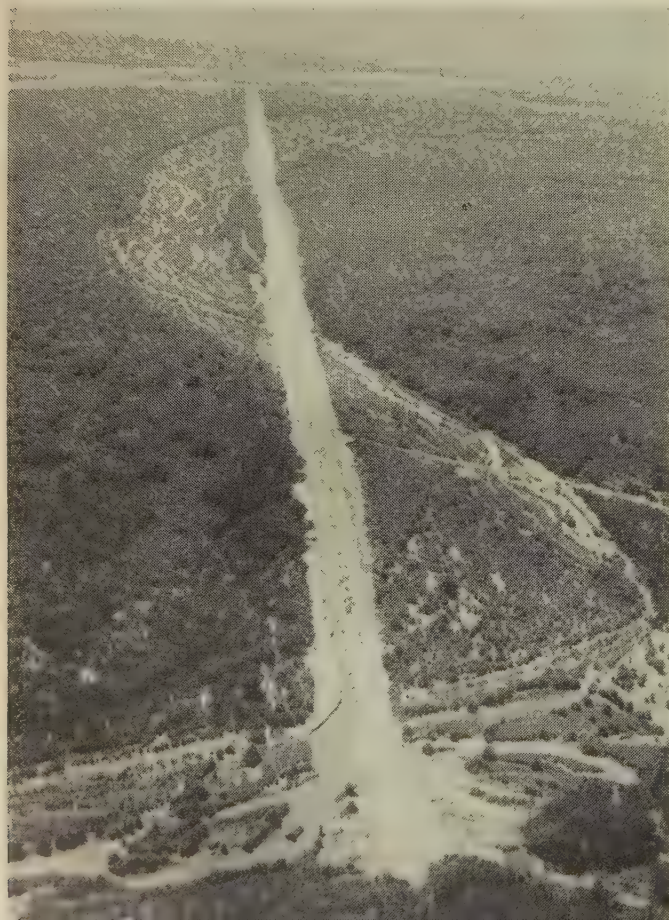


LINING A CANAL with asphalt or concrete is a method of saving water by preventing seepage. The photograph shows gravel being spread on asphalt membrane during lining of the Casper canal, Wyoming

Lining Reservoirs and Canals

Much work has also been done in lining reservoirs, canals and ditches with watertight materials. Every householder is familiar with the way that water-seeking roots can choke off a water line and every transcontinental air passenger with the way his eye can trace the green fringe of vegetation of a watercourse clear to the horizon. So the aim is to line ditches tightly enough to prevent

WATER-WASTING PLANTS (phreatophytes) covering thousands of acres of the valley of the Rio Grande in southern New Mexico. In the centre is a section of a channel which when completed would confine the river and reduce the loss of water to the useless plants



water from seeping out and to prevent invasion by the roots of water-loving plants. Big long-distance canals are lined with concrete as a matter of course. On smaller canals a variety of linings is used—asphalt sprayed on the bottom and sides, allowed to harden, then covered with soil; watertight membranes; or very fine or colloidal clays floated downstream to settle and fill up pores and crevices in bottom and sides, a method which is comparatively inexpensive. In other instances, sides and bottom of the ditch are simply compacted by pounding, then covered with gravel to avert washing. Leakage is especially serious and hard to stop where a ditch or canal runs across a stretch of sand and gravel or of fractured rock, such as the surface of an underground storage basin. Sometimes canals are lined along such stretches only, when lining throughout their length would be too expensive.

Fighting Undesirable Water-Consuming Plants

Phreatophytes, a name given to water-loving plants that are useless to man, present a special problem. Such plants are so efficient at pumping water into the atmosphere that, where they cover the surface thickly, the loss of water may be as great as that from a water surface under a hot sun. Aquatic plants often invade a canal itself, and these must be combated with special care, since what will kill them may, if carried into the field or the reservoir, destroy crops or affect the health of people or animals. Aromatic chemicals, which do their work and then evaporate, are used for this purpose.

But the water-loving plants that root in saturated soil are even more formidable foes than those plants that invade the canals. In the dry southwest, well levels often fluctuate up by night and down by day, in rhythm with the water-using activities of nearby phreatophytes. The U.S. Geological Survey estimates that in the 17 western states such plants may transpire nearly 17,000,000 ac.-ft. of water yearly into the atmosphere from 11,000,000 ac. This is enough water to grow 7,000,000 to 8,000,000 ac. of useful crops, or to supply the entire water needs of many millions of persons.

One of the penalties of storing water is that, as the water slows up at the head of a reservoir and drops its load of silt, it builds up a delta of saturated soil—where phreatophytes promptly es-

tablish themselves and pump the water into the sky. If such plants are destroyed, however, the water will evaporate just about as fast. So the remedy is to canalize—that is, to confine the water to one narrow channel—and, since the penalty of evaporation is inevitable, to pay it in growing useful plants rather than useless ones. It is almost impossible to get rid of phreatophytes by any means other than denying them water. Sprayed, cut or burned, they come back strongly if the soaked subsoil continues to carry the moisture to nourish their roots.

Along the middle Rio Grande above the Elephant Butte Dam built in 1916, many thousand acres of land, virtually the entire flood plain, had become waterlogged. In 1951 the Bureau of Reclamation began canalizing the river to cut down on the resultant water loss. By the end of 1956 the program had saved 165,000 ac.-ft. of water in all, and a project to dike another 12 mi. of river promised to save another 45,000 ac.-ft. annually. This is enormously worthwhile in a land as perpetually starved for water as the Rio Grande valley.

Methods of Preventing Evaporation

The ideal way to carry water would be through pipelines and tunnels, impervious alike to seepage, to plant and animal invasion and to evaporation. Some day the land may indeed be interlaced with pipelines carrying water, as it is now with long-distance gas and oil lines. Some bold innovators even talk of transporting fresh water long distances by pipeline below the sea, as from water-plentiful northern California to water-short southern California, or overland from the Great Lakes to Kansas or Oklahoma. Indeed, there are now water tunnels as long as 25 mi. which move water by gravity through mountain ranges, thus avoiding the immense cost of pumping it up and over.

Surface-Film Method

When it comes to preventing evaporation, however, much simpler and less expensive ways are being explored than to cover the water with stone or metal. Certain chemicals, the types that will spread over the surface of the water in layers only one molecule thick, are amazingly effective in preventing evaporation. The commonest example may be seen in the rainbow glint of oil re-

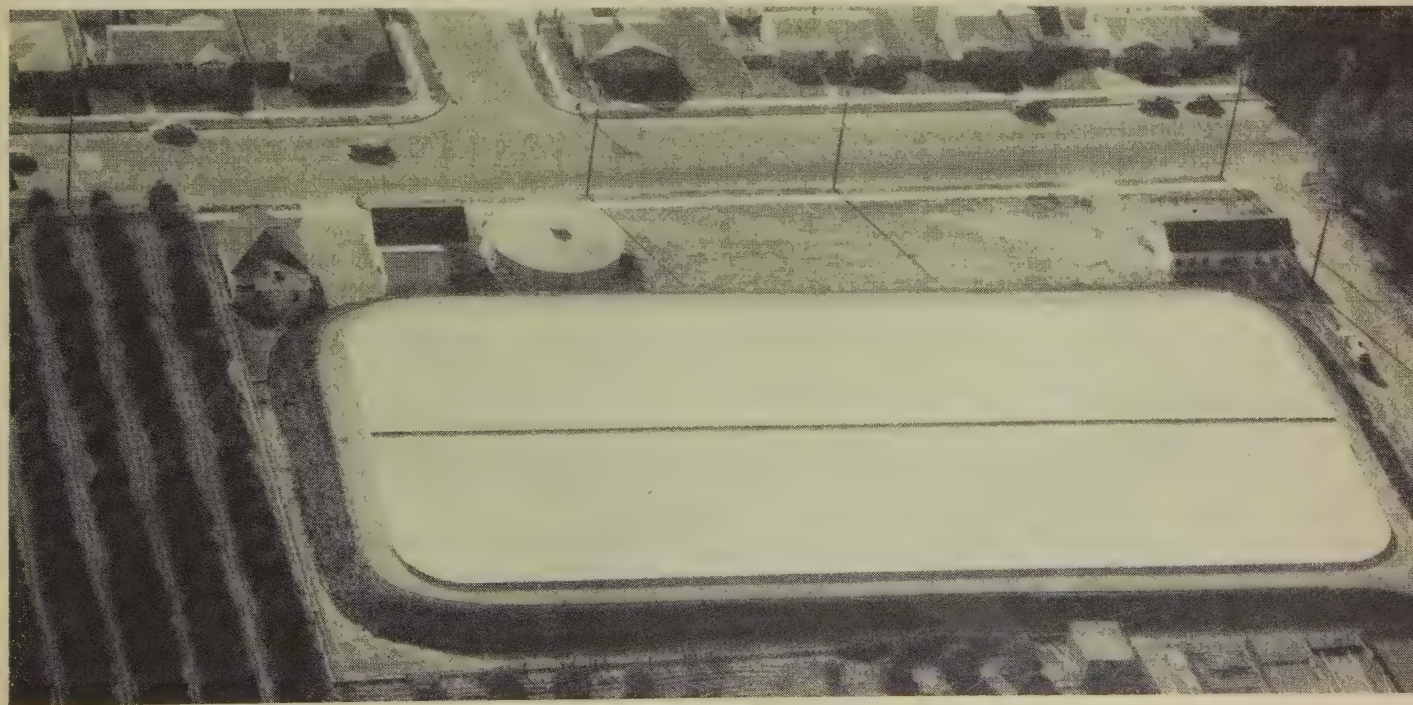
ALUMINUM-COVERED MUNICIPAL RESERVOIR at Santa Ana, Calif. Designed to reduce operating and maintenance costs, the corrugated aluminum cover eliminates evaporation losses and keeps the water clean



"TRASH PLOWING," a method of dry-land cultivation that loosens the soil sufficiently for planting while disturbing the surface only slightly. The "trash" then serves as a mulch to retain moisture in the soil after planting

flected from the surface of a puddle.

The process of evaporation takes place when water molecules at the surface one by one absorb so much heat energy, as from the sun, that they move faster and faster and finally get up flying speed, as it were, and take off. Now if an impervious curtain could be laid upon the water—for example, a sheet of one of the new transparent plastics—these active molecules would exhaust their energies in battering against its undersurface, without being able to break through. The chemical surface film acts in precisely this way, and the amazing thing is the amount of resistance that such a film can put up when it is only one molecule thick, or about one ten-millionth of an inch.



At two points in the United States, elaborate experimentation is going forward to find the chemical best suited to this purpose, yet harmless to users of the water, either plant or animal. This technique has not as yet been introduced on water supply reservoirs and will not be until health authorities are completely satisfied that it is harmless. But it promises more water saving, at less cost, than any other under investigation. From the Dallas watershed alone, evaporation loss is estimated at 35,000 to 45,000 ac.-ft. yearly.

One research project is going forward at Lake Hefner, near Oklahoma City, the scene of earlier elaborate evaporation studies by the U.S. Geological Survey in co-operation with the Bureau of Reclamation. These agencies, together with the U.S. Public Health Service, the state of Oklahoma and the city of Oklahoma City, are partners in the new enterprise. The other research project, financed by private capital, is at the Southwest Research Institute at San Antonio, Tex. There research workers have set up what they call a "fur-lined bathtub" which contains a series of battery cells, each open at the top, each in its own compartment, each kept automatically filled with water and each supplied with its own variety of water-filming chemical. Automatic devices record the amount of evaporation from each cell and thus measure the relative efficiency of the various chemicals which are being tested.

One of the most efficient of these water-coating films is hexadecanol, a material used in cosmetics. W. W. Mansfield, research scientist of the Australian government, reported his experiments with it to an evaporation institute held in 1956 at San Antonio. He had covered a 320-ac. lake with 2.2 lb. of hexadecanol. It spreads itself, as do all these surface-covering chemicals. Placed in small floating boxes with gauze windows open to the water surface, it feeds out molecule by molecule, the molecules clinging together so as to keep intact the surface layer, until the whole surface is covered or until the substance is exhausted. Waves do not part it, and it recoalesces immediately after the water surface is broken by an object, be it a small one like a raindrop or a large one like a motorboat.

Mansfield calculated that his invisible coating, only one ten-millionth of an inch thick, saved 45%, or nearly half, of the water that would otherwise have evaporated from the lake. It cost about 50 cents a pound, so the water saving on the 320-ac. surface was accomplished at a total cost of \$1.10 for material. If this saving were even as much as one vertical inch of water for the period, it would have totalled about 27 ac.-ft. or nearly 9,000,000 gal. of water, at a cost for materials of about four cents an acre-foot.

If the technique is as efficient as such research indicates, and harmless to health of man, animals or vegetation, it offers the

possibility of huge water savings, since 30 in. are lost to the atmosphere yearly from an exposed water surface, even in relatively cool and humid climates. A drop of water in a reservoir is worth many in the clouds. For example, consider the 800,000 ac.-ft. which yearly evaporate from the surface of Lake Mead. Once risen into the sky it is gone forever, except for that small fraction which may fall again as rain or snow and remain upon the surface. And even if it all fell again at once, it would make a shower of only about one-sixth of an inch over an area the size of the state of Colorado. Yet where it is available from the storage reservoir, it is a treasure. One-half of it, or 400,000 ac.-ft., would be enough to irrigate 200,000 ac. of land or to supply with domestic water a city the size of Los Angeles. If water savings of this order can be made at costs as low as the experiments indicate, the surface film technique may become important in attempts to save the increasingly precious supply of water.

Mulching the Surface

Every home gardener knows how much more moist the soil surface stays beneath a covering of grass clippings or leaves. Farmers, particularly in the drier parts of the United States, have learned much about the water-conserving efficiency of a mulch covering the surface. Dry-land farmers plow with the aid of special equipment which "leaves the trash on top" and the surface largely undisturbed, yet loosens the underneath soil to encourage the entry of rain from the top and to break the capillary train which brings water up from beneath toward the drying surface. By such means crops can be raised on amounts of water that seem unbelievably small to humid-region farmers. Dry-land farmers also practise fallowing, which means leaving the soil idle in alternate seasons. They cultivate it sufficiently, however, to keep it loosened up and to destroy water-robbing weeds and grind them into the surface, which also helps to clothe it against evaporation.

Dew Nourishment

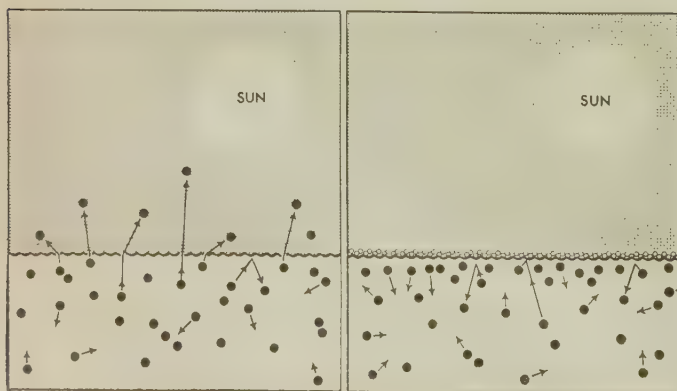
Another technique for establishing dry-climate agriculture, only lately being intensively studied, employs dew nourishment. Plant circulation is reversed at night; that is, water which falls upon the leaves as rain or gathers there as dew is absorbed and passed into the body of the plant; and, if there is a surplus, it may be stored in the soil by the root tips.

The Israeli, struggling with the problem of making their southern desert produce crops, have studied dew agriculture most intensively. In the United States, research has been carried on by F. W. Went, of the California Institute of Technology, and others. The promise of the process lies in the extraordinary efficiency with which plants utilize dew. In regions where dew is heaviest, it can apparently take the place during the growing season of five to ten inches of rain or irrigation water. So a very fine spray of water applied on dewless nights apparently can have the effect of several times as much applied during the hot day, either by spraying or through ditches. This means that a few inches of simulated dew might accomplish as much growth during a crop year as two feet or more of irrigation water. Some specialty crops in California apparently ripen their fruit on dew alone, during the rainless season. But Went warns that smog defeats the formation of dew on the ground, since the dew forms on the particles of smog which continue to float in the lower air.

Utilizing Water-Saving Plants and Animals

Another way to stretch nature's bounty in a dry climate is to find and cultivate useful plants that require only a small amount of water. The Israeli, again, have taken the lead in these investigations. Such plants are very tough and able to stand the repeated wilting and freshening, the stretching and contracting, that ruin

SAVING WATER WITH CHEMICALS. Normal process of evaporation is shown at left; the heat of the sun sets molecules in motion with the eventual escape of some as vapour. With the spreading of a chemical film on the surface, the water molecules are unable to break through the cohesion of the chemical molecules





INVESTIGATION OF THE SNOW PACK. Left, team has driven hollow tube into drift to determine depth of the snow; right, snow-packed tube is weighed to gauge the water content of the snow

lusher types of plants when they are subject to a capricious water supply. Desert plants consequently do not make good eating, though they are useful for other purposes. One promising dry-land variety is the grain sorghums, now widely cultivated in the Great Plains of the United States because of their ability to deliver a crop under conditions so dry as to mean failure for other crops, even wheat.

Still another way to make a dry climate productive is to raise animals which nature has evolved to survive in such conditions. The camel, although not indigenous to the United States, is a striking example. It is "air-cooled"; *i.e.*, its nighttime body temperature of 93° F. will go up to 105° F. before it begins to sweat, even slightly. The camel's faeces are almost dry, and it eliminates less than a pint of water daily. Its body is apparently capable of making some of its own water by combining oxygen from the air with the hydrogen of the carbohydrates it eats. Also, when the camel begins to run short of liquids it is apparently capable of concentrating the remaining supply of water in its blood plasma, thereby avoiding the thickening of plasma which is a precursor of death by thirst.

Gauging Supply

Another way of stretching the water supply is to determine precisely the amount that will be available by seasons, and then to adjust one's activities to the supply. If an electric power company, for example, operates both steam and hydro plants, foreknowledge of river flow allows it to operate its plants as a team for utmost efficiency. Most such companies therefore employ private meteorological services to pinpoint expected flow, and several use cloud-seeding services to increase rainfall and snow pack upstream. Some cities which depend on rivers for their water spend money to forecast precipitation, and some of them, such as Ft. Worth and Dallas, Tex., also employ cloud seeders.

A power company which has its turbines between a higher-level reservoir and a lower-level one may increase the supply of power to meet peak demands by using water twice. It may employ surplus power during times of slack demand to pump the water back up from the lower reservoir to the higher one. Then the water is available to run back down through the turbines again, when the demand for power is highest.

The co-operative snow surveys which report on winter snow pack on western mountains are a fascinating example of teamwork. The mountains are deficient in ground-water storage, so the main water supply to be expected from them is in the snow, which piles high on their upper levels each winter, driven there

by the moist Pacific winds, and melts to run off in the spring and summer. Cities, industries and irrigation farmers all want to know how much water to expect. The interest of the latter lies largely in application of western water law, "first in time, first in right." This means that older decrees, on record in district courts, are satisfied first, and later comers get water only if there is enough for all. Therefore many farmers in an irrigation district must adjust their plans to an expected full supply of water, to a partial supply or, in a dry year on the mountains, to no water at all.

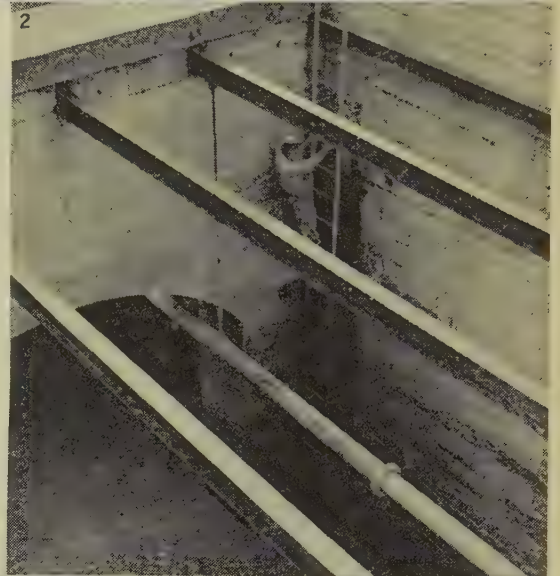
To meet the great need for information about the snow pack, the federal and state governments, plus private companies and individuals, established about 20 years ago the co-operative snow surveys that cover the whole mountain west and result in monthly water supply forecasts. Surveys are run monthly from Jan. 1 to May 1 on about 1,200 snow courses that together cover most of the important watersheds. Participants are members of the U.S. Soil Conservation Service, the U.S. Geological Survey, state experiment stations and state engineers, the Forest Service, the National Park Service, the army engineers in some areas, plus local organizations and persons such as power companies, city water departments, high-country ranchers, etc.

The procedure is simple but tiresome. Once monthly, a crew of men slogs on snowshoes over a 20- to 30-mi. course, stopping at the same spots each time. One man thrusts a long hollow tube vertically into the snow until it reaches the soil surface, withdraws it filled with a core of snow, and his partner weighs it on portable scales. Snow varies greatly in water content, but the difference in weight of the tube empty and full gives the weight of the contained water, regardless of snow depth. About 20 to 40 of these stops are accomplished daily. Once monthly all such results are added up, and maps and reports giving the totals, in terms of normal, are sent to all interested persons. These reports correlate with the monthly *Water Resources Review* of the Geological Survey, with reports of the Bureau of Reclamation as to storage in its reservoirs, and with the monthly *Water Supply Forecasts for the Western United States* which are issued in partnership by the Weather Bureau, the Soil Conservation Service and the California state division of water resources. Canadian provinces also participate in the case of watersheds which, like that of the Columbia, lie partly in Canada.

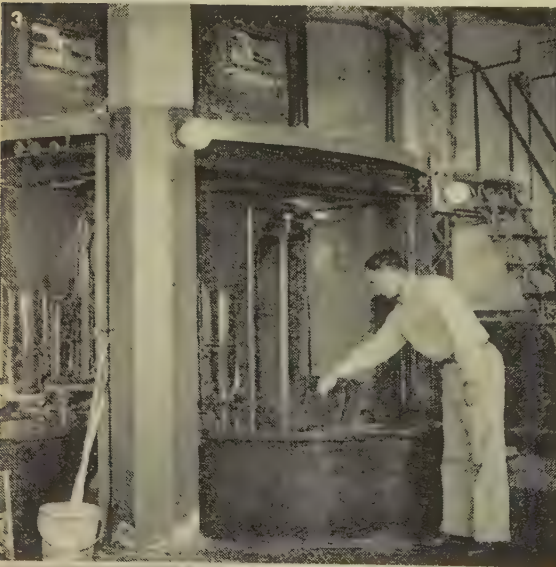
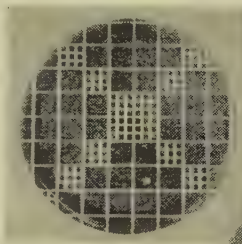
Ingenuity has short-cut some of this work. The California Electric Power Company has its watershed in the high Sierras planted with poles carrying vertical crossbars one foot apart. In one 35-minute flight in an airplane, an observer can accomplish what formerly kept a crew at work in the high mountains for a week, by photographing the poles to record how deep the

WATER PURIFICATION

This series of photographs illustrates some of the processes required to cleanse and purify water for drinking and other direct human use. The city is St. Louis, Mo.; the source of water is the Mississippi River; but the situation is similar for many other cities which are unable to obtain fresh water from mountain reservoirs and an aqueduct system (see p. 9). Each 1,000,000 gal. of river water at St. Louis is freighted with nine tons of suspended matter—principally mud—and has a high bacteria count caused by the dumping of sewage and industrial wastes upstream. The process of purification takes 24 hours. It begins (fig. 1) at the intake towers. Those shown are the three at the St. Louis Chain of Rocks bridge. Water flows by gravity through rock tunnels into a masonry chamber 68 ft. deep called the "wet well" (fig. 2). Before reaching the well the water has been screened of fish and large submerged particles such as twigs and branches. From the well the water is pumped into a presedimentation basin where about half the mud settles out and is deposited. As the water passes from this basin, lime and iron sulphate are added. Fig. 3 shows the slaker tank in which lime is converted into a liquid before being added to the water. The water and chemicals are mixed thoroughly in a baffle chamber (fig. 4) and pass into a sedimentation basin. The chemicals act to form jellylike coagulants which carry suspended matter and bacteria quickly to the bottom. After leaving this group of tanks the water is sterilized by the addition of more chemicals—ammonium hydroxide and chlorine. Final clarification of the water is achieved by filtering it through sand and gravel. Fig. 5 shows a cross section of a model of a typical filtration tank. Finally, the purified water is ready to be distributed to the consumer from one of the pumping stations (fig. 6).



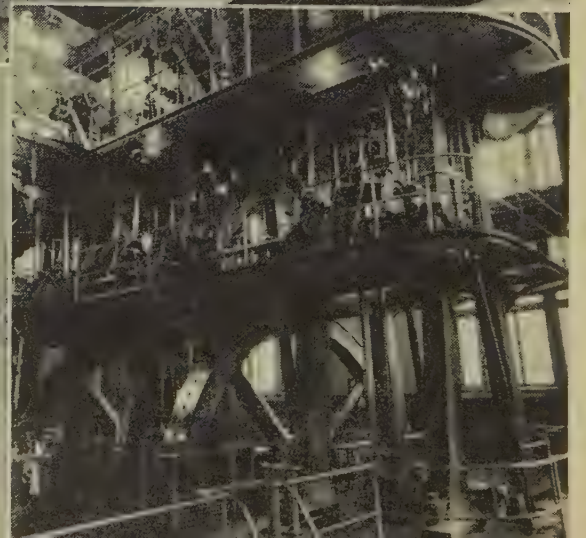
Untreated water (left) and purified water (right), magnified samples showing elimination of harmful bacteria. Each white dot represents a colony containing several million bacteria (colony in cleansed sample is harmless variety). Grid pattern aids bacteriologists in counting colonies



SAND

GRAVEL

DRAIN



snow is around each. The photographs give the power company a very good idea of how much runoff to expect in the spring. In some areas, helicopters are employed in much the same fashion. Harry L. Potts, water supply engineer of the Denver Water Commission, simply drives monthly during the winter to a certain spot facing the 13,000-ft. mountains which provide a large proportion of the Denver supply. He photographs these mountains and calculates the relative area covered with snow. By comparing these photographs with those taken in past years, Potts obtains a close approximation of expected runoff.

The army engineers in southern California have gone one step further. They have planted cement blocks at ground level at selected points on the watershed, each block containing a wafer of radioactive cobalt in its upper surface. The gamma rays from this cobalt are beamed at a target, a radio transmitter, directly above. The water content of the snow that covers the block in winter weakens the rays in direct proportion to the amount of water cover; and the weakening of the radio signals, registered at a central point, gives the engineers a very good idea of the amount of runoff to expect.

Saving at Point of Use

The problem of saving water at the point where it is used has many facets, and all of them involve community control, sometimes to a degree for which public opinion is not ready. The attitude of the American citizen often constitutes one of the chief problems of the water supply engineer. It frequently represents an unrealistic complex arising from a past of unthinking plenty. Why should water be short? It falls all around us many times yearly from the bounteous sky. We find it hard to realize that the water we use, unlike the rain we run to get out of, is essentially a processed or even manufactured commodity, produced for our use by great labour and immense ingenuity and at large community cost. Subconsciously we think of water as being "free," and it annoys us to be ordered to save it, or to be told that we must pay more for it, or that we must finance a great construction program in order to ensure our continued use and enjoyment of it. We are the touchier because water supply is normally one of the duller and most routine of community activities, and "water never makes news until the well is dry" to paraphrase Thomas Fuller.

The U.S. Department of Commerce reported in 1955, however, that only 58% of the nation's major water supply departments had satisfactory reserves and that it would take \$3,200,000,000 to provide sufficient national reserve capacity. Nearly one-fourth of all communities in the United States are chronically short of water, to the extent that they impose some form of rationing. It is a rude shock to the city dweller, with his unthinking acceptance of the miracles that capable city government works daily on his behalf, to be rationed on water supply. Yet sometimes it is a salutary shock, as with New York city in 1949-50. The experience of that metropolis brought home to the nation the problem of water supply as nothing else has done. Since New York is a national nerve centre and news centre, water supply has been more nationally newsworthy ever since.

A picture of what life is like in a community that depends almost entirely on fresh water won from the sea might provoke similar interest. In Curaçao, in the Netherlands Antilles, the government sells freshened sea water to the people at \$1,300 an acre-foot, and still loses money; a household water bill may run from \$40 to \$50 monthly; people have found that there is a minimum drip where water meters will not register, and they run their faucets at that rate all day long, catching the water in pans. Industrial employees do all their bathing on "company water."

It isn't even necessary to go that far. Chamberlain, S.D., has

more water treatment capacity than the town needs, and sells its surplus "cash and carry" to surrounding towns and residents at \$1,900 an acre-foot, to which the buyer must add the cost of transportation. No water is wasted by those buyers! And when Dallas, Tex., in 1956 was forced by drought to call upon reserve supplies too brackish for many tastes, its dairy companies did a rushing business in delivering sweet water with the morning milk, and at nearly half the cost of milk, or 20 cents a half-gallon.

But the difficulty of providing an adequate water supply, in a nation whose inhabitants are accustomed to get all they want to use—or to waste—for only a few cents a ton, lies largely in persuading the public to pay enough for it. Some cities are wholly metered—that is, payment for water is based directly on the amount used. Others use various payment formulas based on such factors as size of lot, number of rooms and outlets, etc., but without measuring every gallon used. It is probable that every water supply manager, given a new start, would prefer metering, but it is hard to change over to meters because of the cost. Some cities meter new customers, and others meter consumers to whom they sell water outside the municipal boundaries.

Careless use rather than cheating is one of the greatest water wasters, and the way to check waste is to impose a charge proportionate to the amount of water used. In New York in 1949-50, a check on household facilities uncovered thousands of leaks that in the aggregate were wasting millions of gallons daily. Chicago, in a similar survey, uncovered leaks that were costing the city more than 10,000,000 gal. daily. Even a dripping faucet may waste many gallons over a long period. Nor is the householder the only offender. Neglect of community lines may result in losing thousands of gallons of water that have been brought a long distance and made wholesome for human use, all at community expense.

The psychology of plenty, where there actually is no plenty, sometimes affects public authorities as well as consumers. How else is it possible to explain commercial and industrial water-rate schedules which reward the large user by lowering the price per gallon as the quantity used goes up, and thus encourage them to waste water? In one city the cost to large users is as low as nine cents per 1,000 gal., and it was discovered during a drought that as much as 10% of the city's entire consumption was passing only once through air-conditioning or air-cooling devices and was then being dumped into the gutter. This condition was ended, and large savings were effected, merely by compelling such users to install recycling devices. Most users discovered that they were only being compelled to adopt good business practices, since, after the cost was amortized in a few years, they would save on their water bills.

Persons and organizations interested in community water supply problems might find it possible to stop large "leaks" of this nature by adopting stricter rules. Saving water that has already been expensively transported and treated is a thriftier way of stretching the community supply than building large and expensive new works to develop a new source.

Technical studies have shown that there may be considerable avoidable waste at the point of use on the 28,000,000 ac. of irrigated land in the United States. Irrigation farmers tend to wait too long to apply water and then overapply it. Since most crops do as poorly in a saturated soil as in one that is too dry, this alternation of water feast and famine cuts down their yield. Several types of water-need meters have been devised, most being based on the difference in electrical conductivity between a moist medium and a dry one. Porous blocks so made that they dry out at about the same rate as the surrounding soil, with an electrical attachment at either side leading to the surface, are buried in a field. The farmer clamps a resistance meter, with earphones, to the exposed attachments. If the underground block is dry and



TERRACED WADIES (stream beds) of the Negev desert, an aerial photograph of the remains of an elaborate system of water control devised by the Nabataeans, an Arab people of about 2,000 years ago. The lines across the channels are the bush-reinforced walls of the terraces. By collecting soil and water in the terraces the Nabataeans were able to farm the desert despite an average annual rainfall of only four inches. Some of the fertile terraces are still being cultivated

its resistivity high, he hears the high-pitched cry of his land for water; silence or a low hum reflect the moist contentment of the earth.

Large industrial users of water have found that it pays, either in money, or in community satisfaction with them as neighbours, or both, to install water-saving devices. Where water costs as much as \$500 an acre-foot, as in the Morro Bay installation of the Pacific Gas and Electric Company that freshens sea water for plant use, recycling and the utmost economy of use are automatically dictated. The Kaiser Steel Company, at its Fontana, Calif., plant, used recycling to reduce to 1,100 gal. the net amount of water needed to make a ton of steel, whereas 65,000 gal. is normal in the industry. Oil refineries that would otherwise consume as much water as a large city have been able to reduce their needs to a fraction by recycling. Some industries have found large sources of water in sewage effluent. The Bethlehem Steel Company, for example, buys part of the product of the Baltimore

sewage treatment plant for cooling and other purposes that do not involve human use.

Sources of Additional Water

But even if the nation should effectively make use of much of the water which is now wasted, people in some areas would still have to find new sources if population and the use of water should increase at the rate now indicated. Therefore, many agencies are studying the most promising means of providing new water. Three of the lines of endeavour, not necessarily in order of promise or importance, include: Development of new ground-water sources; production of fresh water from sea water or from brackish waters; and the possible increase of precipitation by means of cloud seeding.

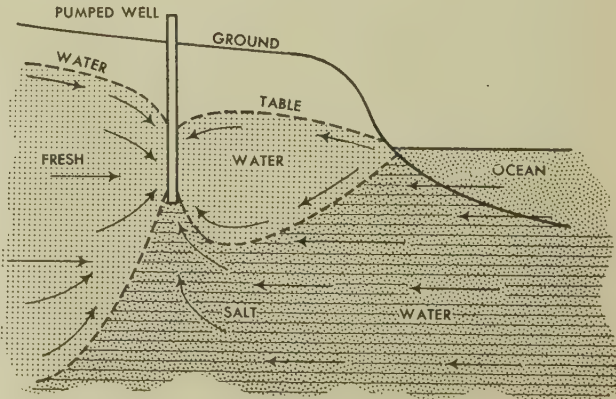
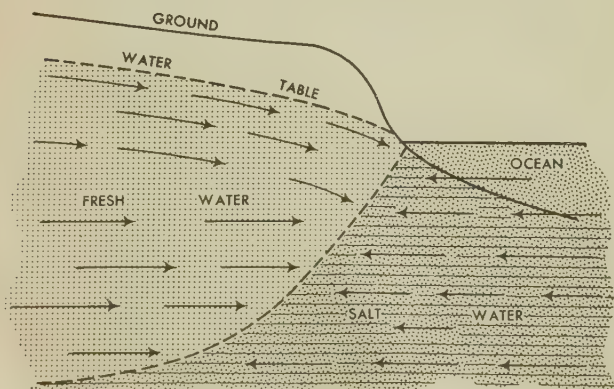
Ground-Water Development

The agencies studying ground water are led by the U.S. Geological Survey, which has been collecting data on the subject since 1895, much of it in co-operation with state and local agencies. The supply of ground water is still relatively undeveloped. In many areas it may offer a large potential resource, since there is more water stored underground than on the surface. Much of it, however, is inaccessible, and much is so laden with salt and other minerals that it is unusable without special treatment.

Of the water that falls on the United States and is retained for some time before it finds its way back to the sea, an average of about 85% remains on the surface and 15%, or perhaps 200,000,000,000 gal. daily, percolates into the soil, some of this into the underground strata. Some remains in the soil only a few days to a few months, until summer brings its water-consuming plants and its evaporating sun and wind. But some moves deeper and becomes ground water, although not all water underground is entitled to this term. Water that is merely held in moist soil, where there are air spaces between sand or soil particles, is not ground water. Molecular attraction holds this water so strongly to the soil particles that it is impossible to collect the water from the soil. Nor is it possible to collect water in useful quantities from the rocks, of which it is a chemical constituent.

Ground water may be described as that free water which lies below the water table, the latter being the level beneath the surface at which soil or rock is entirely saturated. Quantities of ground water large enough to be considered worthwhile additions to the "manageable water crop" are found only in underground sand or gravel, or in fractured rock or rock such as limestone that

SALT-WATER INTRUSION. Natural shoreline conditions are shown at the left; the fresh-water table slopes gently toward the sea. Excessive pumping, however, as shown on the right, depresses the water table and draws salt water into the fresh, eventually contaminating the well



has been eaten full of holes by the chemical action of the water itself. Such underground formations are called "aquifers."

Salt water is denser and heavier than fresh water. Therefore in the slow arrangement of geologic ages, most supplies of fresh ground water ride on top of salt-water strata. Too rapid withdrawal of the fresh water may bring the salt water rushing in to replace it. At many points near the seacoast, fresh water is obtainable from wells which lie almost to the brink of the sea, but some communities in such places have suddenly found their wells offering only salt water. One Texas seacoast community found that overpumping had lowered the fresh-water table to a depth 100 ft. below sea level.

Wide areas of the nation, where impervious rocks underlie the surface only a few feet down, or where rainfall is so scanty that the underground remains dry and there is no subsurface runoff from mountains, are without large ground-water resources. Ground-water supplies are largest where copious rains have soaked the surface for ages.

Some large reserves are found along the beds of "fossil rivers" which have dried up on the surface. One example is the mighty Teays, a river greater than the present Mississippi, which once rose in what is now North Carolina and flowed across Ohio, Indiana and Illinois to empty into an arm of the Gulf of Mexico which then extended above the present site of St. Louis. Other supplies percolate underground toward living rivers or are cut across by the river channels and are in geological fact tributary to such rivers.

From the mechanical standpoint all ground waters may be classified as those under pressure and those not under pressure. The latter may be tapped by the ordinary surface well, a familiar sight in rural places. It consists simply of a vertical shaft sunk far enough into the ground-water zone so that the water in the surrounding soil will run into the well by gravity. If such a well were left alone, the water would simply rise to the water-table level and stay there. But pumping creates a condition in which the water is drained by gravity from the soil around the well, forming an inverted cone. Drainage into the well is down the slope of this cone.

In many cases the water has percolated a long way down slopes of inclined underground strata. It sometimes has taken hundreds or thousands of years for the journey, and the water finally has ended up as an aquifer scores or hundreds of miles from the mountains or hills where it originally entered the ground. Typically, it has seeped along permeable layers trapped between or beneath strata of dense impervious rock, and so is under pressure, sometimes great pressure. It may find a fissure and escape in living springs, some so large as to originate small rivers. In many areas the underground pressure pool has remained to be tapped by wells driven through the upper rock lid; here the water will rise in the well and, if the pressure is great enough, will spout into



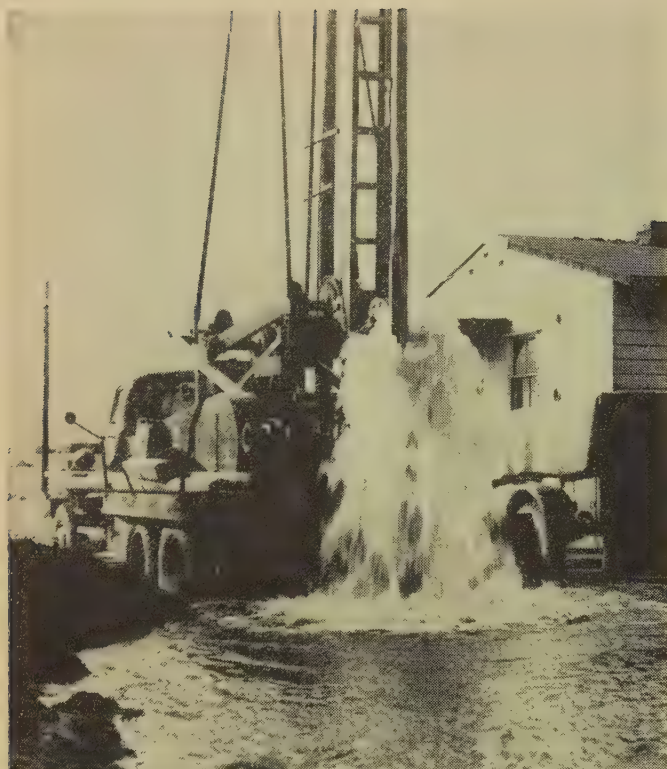
BAKED MUD FLAT, once the Red Butte (Ariz.) water hole. During the ten years from 1941 to 1951 water was continuously withdrawn for irrigation, but because of severe drought conditions little was replaced. As a result, the ground-water level fell until all that remained was the hard mud surface with fissures large enough to admit a man's arm

the air. This type of underground basin and well is called "artesian." There are many such basins in the United States, and their history is invariably that they lose pressure as more and more wells are put down, until at last the wells have to "go on the pump." Such wells are much more expensive than the simple surface type of well.

Some ground-water reserves have been greatly overdrawn, as in the Texas Panhandle where "water mining" is estimated to be drawing water from the underground store at 20 to 40 times the natural rate of replenishment. But other such reserves have scarcely been touched. One of the largest of these stretches from north to south along the Great Plains, beginning at some distance from the Rockies whence the water originally flowed. All these plains were formed of material washed or blown down from the Rockies as the latter were worn down, thus forming huge reefs, now underground, of sand and permeable soils, into which the mountain waters also percolated and lodged. Nearer the mountains the rivers, generally speaking, have cut into and drained the underground reserves.

The "New Water" Theory of Stephan Riess

Stephan Riess of California formulated a theory that "new water," which never existed before, is constantly being formed within the earth by the combination of elemental hydrogen and oxygen, and that this water finds its way to the surface and can be located and tapped, to constitute a steady and unfailing new supply. In 1956 a foundation was financed by Clint Murchison of Texas to investigate the Riess theory, which Riess claimed



ARTESIAN WELL flowing just after penetration of an artesian zone 210 ft. deep within a glacial drift near Kent, Wash. The water is shown flowing at about 1,700 gal. a minute through the six-inch-diameter well

to have vindicated by the successful drilling of many wells.

Hydrologists generally doubt the existence of "new water," although that of "juvenile water" has long been conceded. This latter is water which has always existed in the earth but which is only now reaching the surface through volcanoes, geysers, hot springs, etc. It is generally too full of minerals to be fit for human use.

Dowsing or Water Witching

Another controversial theory for finding water is that of dowsing, a procedure which involves holding in the hands a forked stick (generally of hazel, willow or peach) or other object. When held over a source of water, the forked stick turns downward strongly. Only a few persons seem to have the gift of locating water by this method, and the theory is scouted by most hydrologists. But it has strong advocates who claim many successes in finding subsurface water by means of it.

Freshening Salt Water

One potential source of an increased water supply lies in reclaiming waters which are too full of minerals to be useful. The most striking example is in the concerted efforts being made by many agencies, public and private, including the United Nations, the U.S. government and other governments, to find economic means to freshen sea water.

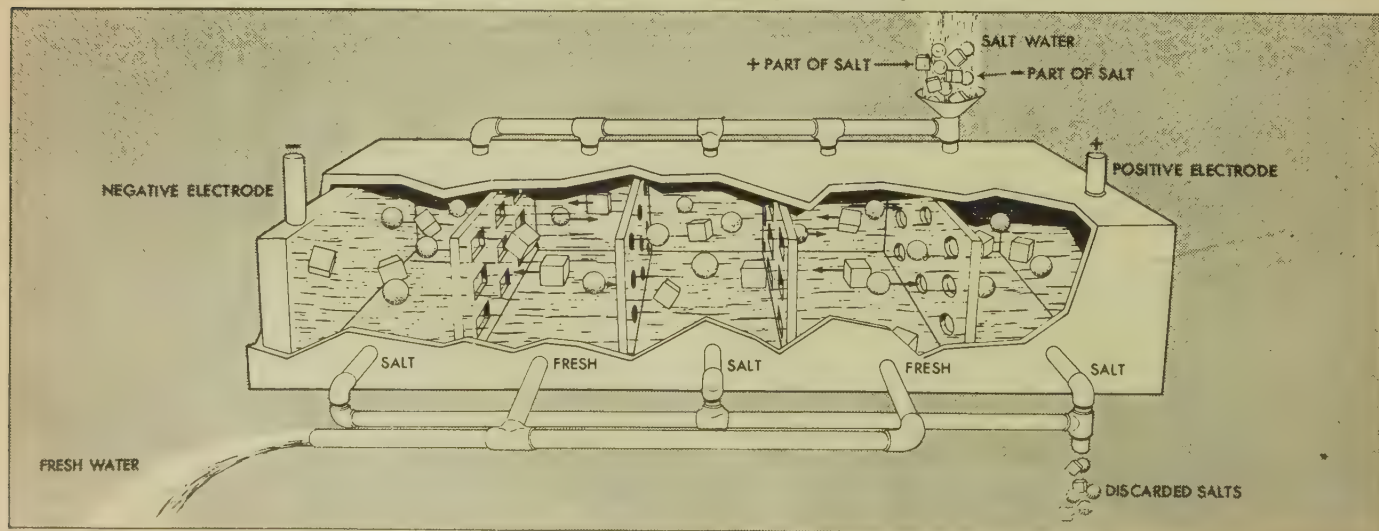
The art of freshening sea water goes back to the 16th century. It is now practised to reclaim many billion gallons of water yearly. Conversion equipment varies from survival kits on sea rafts to huge installations supplying the needs of whole populations. For example, the sultanate of Kuwait has a purification plant that supplies 2,000,000 gal. of fresh water daily, using as power "free" natural gas that would otherwise be wasted, and in 1956 the capacity of this plant was being doubled. Formerly, Kuwait had to get its fresh water in the dry season from the confluence of the Euphrates and Tigris rivers, 100 mi. away, whence it was brought by dhow. The French have an experimental installation in the Gold Coast in Africa which brings cold sea water from the depths and vaporizes it in a semivacuum, producing fresh water, salt and power, all scarce commodities in the region. It has already been mentioned that Curaçao, in the Netherlands Antilles, produces fresh water from sea water, and in 1956 it was announced that the government of Aruba, a neighbouring island in the Netherlands Antilles, had let a contract for the designing and building of the world's largest salt-water conversion plant on the island. Large installations were also being planned on the island of Bahrein in the Persian Gulf, and in Israel.

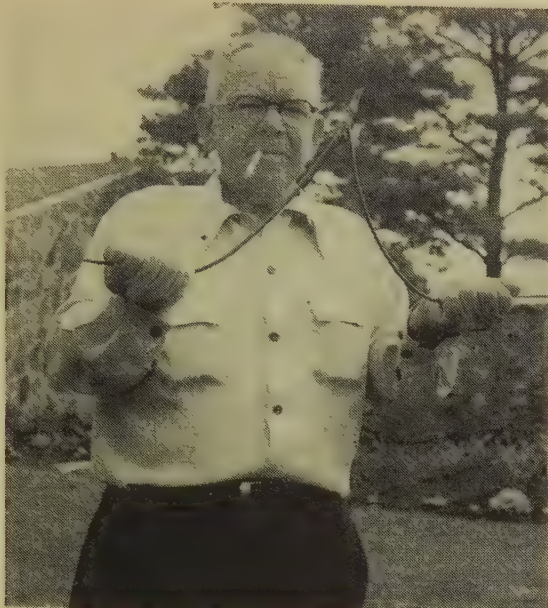
One big utility in the United States produces fresh water from sea water for the needs of its plant, while another in north Texas is experimentally producing fresh water from brackish waters which are plentiful in its vicinity.

The U.S. congress has financed an elaborate and continuing research program seeking an economic process for freshening sea water and other salty waters. This program centres in the office of the Secretary of the Interior. Any installation to use sea water would necessarily be near the coast, but seacoast cities are large consumers of river water which flows down from the interior. So if they were supplied cheaply from the sea, such cities could then leave the river supplies to the people inland.

But all such programs must meet the stern test of economics;

FRESHENING SEA WATER BY ELECTRODIALYSIS. Salt water enters a charged watertight tank at the top. In the two chambers marked "Fresh" the positive ions, shown as cubes, pass out through screens toward the negative electrode; similarly, the negative ions, shown as spheres, pass through a screen on the opposite wall toward the positive electrode. In the three chambers marked "Salt," however, the screens are reversed in relation to the electrodes, thus trapping and collecting the ions





DOWSING

Water dowsing (or water witching) is the detection of supplies of underground water through the use of a dowsing rod—a flexible Y-shaped twig of any woody plant (commonly hazel or willow), or a pendulum. In the hands of a skilled and experienced dowser, it is claimed, the device will by its movements enable him not only to locate underground streams and veins, but even to tell the depth of the vein, amount of flow and quality of water.

Henry Gross of Biddeford, Me. (shown above), has dowsed for individuals and companies in many parts of the United States and other countries. Novelist Kenneth Roberts, Gross's associate, reported many of their cases in two books, *Henry Gross and His Dowsing Rod* and *The Seventh Sense*, both published by Doubleday & Co.

that is, their costs must be compared with those of other means of obtaining water. Present programs are situated in locations where water is needed so badly that cost is not the final criterion. To quote a report on the subject made to the United Nations, "the cost is never too high when human life is at stake." No one cares that fresh water from a survival kit costs \$5 a pint; but for large-scale use in competition with other sources, such as for supplying an American city or for crop irrigation, fresh water from the sea is still too costly. Many methods have been devised to separate salt from water or water from salt, but all develop innumerable costly complexities when put into actual operation.

Sea water averages 35,000 parts per 1,000,000 of contained minerals, mostly sodium and chloride, but including at least 49 of the elements. The U.S. Public Health Service's criterion for drinkable water of the best quality allows for no more than 500 parts contained solids per 1,000,000, although 1,000 parts is permissible. In some areas people survive on water containing as high as 3,000 parts per 1,000,000, simply because they have to. They are never happy about it.

Vegetation, particularly food plants, is more selective about water than is man or his animals. For example, some plants are hurt by as little as 1 part of boron in 1,000,000 parts of the water they drink, and by very small amounts of sodium. Salt hampers the water intake of plants and may starve them by indirection. In short, any water that plants thrive on is acceptable to man, but the reverse is not true. The Bureau of Reclamation rates as "excellent" for irrigation only water that contains less than 175 parts per 1,000,000 of minerals.

Concerning cost, the Department of the Interior program set a first goal of \$40 an acre-foot for irrigation water and \$125

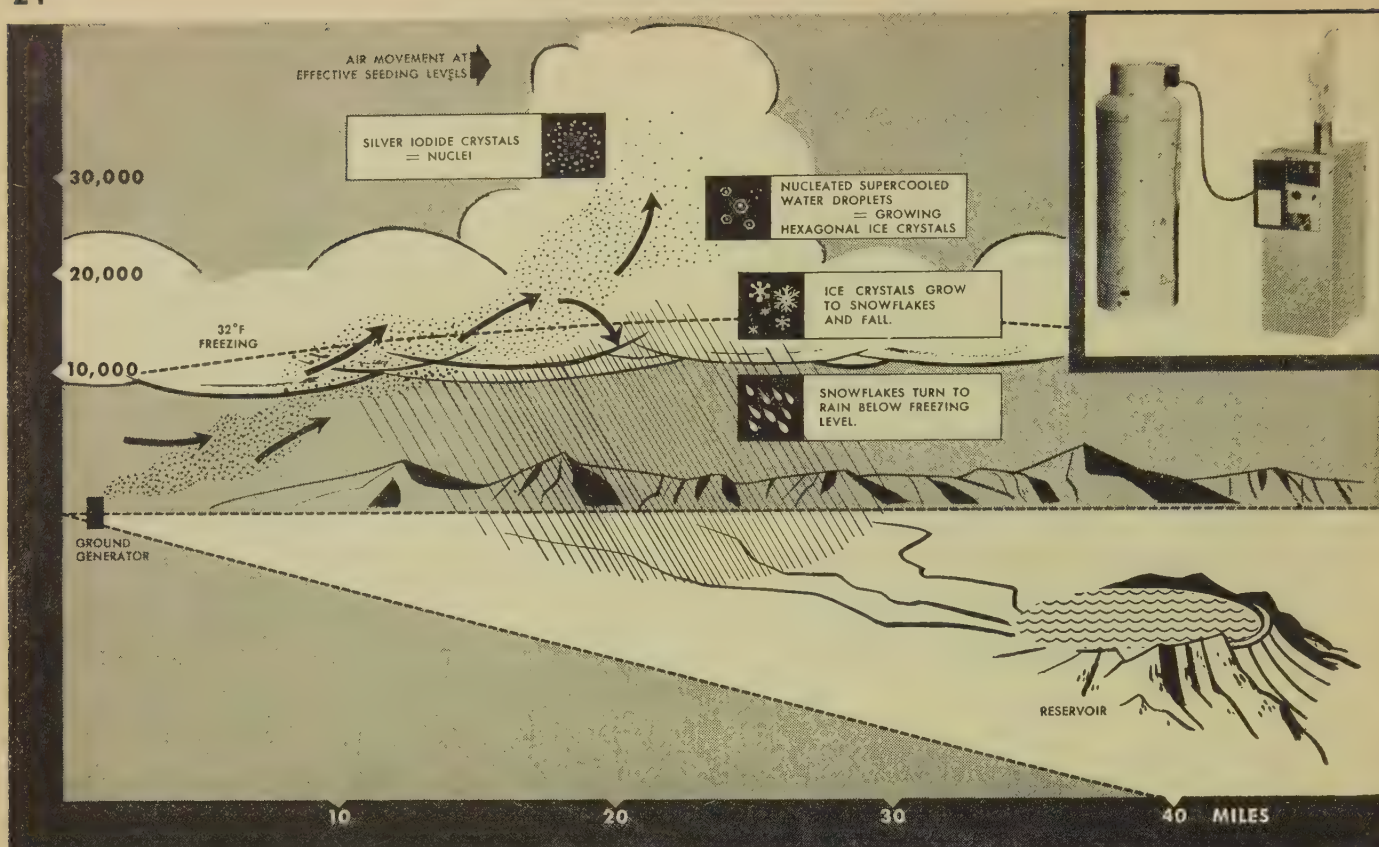
an acre-foot for municipal water. These figures are very high, several times the current costs of providing water except in very special circumstances. But even so, they are far from being attained. At present, by existing methods, from \$300 to \$330 an acre-foot, or 90 cents to \$1 per 1,000 gal., appears to be the practicable lower limit of cost. To this must be added the cost of distribution and of getting rid of the solid salts or the brine into which the unwanted minerals concentrate. The sea water conversion plant of the future will probably be a complete chemical conversion unit which will continuously separate many useful products from sea water—pure water, lithium, magnesium, bromine, chlorine, gold, sodium, etc.

The limiting economic factor for fresh-water extraction is the cost of energy. It takes a certain required amount of energy to free water from its mineral content, whether that energy is supplied by nature or by man. In the case of sea water the minimum cost of such energy runs about \$20 an acre-foot, even if power is supplied at the low figure of $\frac{1}{2}$ cent per kilowatt-hour. So the search for an economical method of extraction evolves into a search for low-cost power. Cecil Ellis, in *Fresh Water From the Ocean*, computes that the separation of 1,000,000,000 gal. daily of fresh water from sea water would require a power plant of 830,000-kw. capacity, or enough to supply a large city.

It is possible, of course, to use the "free" energy supplied by the sun to evaporate sea water. However, the sun's energy is available only part of the time, and the complex apparatus which would be required to collect and condense the water would be costly. Briefly, no present method of freshening sea water appears to promise really large supplies at a cost low enough to supplant present sources for general use. Yet as the work progresses, new ways and short cuts open up. Hence, the program appears to be a wise and long-sighted one, to provide for a day when increasing need and decreasing cost may meet. Congress in 1956 again increased the funds first provided for this program and lengthened its life. In that year, Secretary of the Interior Fred A. Seaton said he thought fresh and palatable water from sea water might be piped to many points in America "before the year 2000 or even 1990."

Following are some possible ways of reclaiming salt water, but no attempt is made here to choose the best among them, since each has its earnest proponents:

1. Freezing salt water to drive the brine into an unfrozen core, then cracking off or otherwise removing the fresh-water ice.
2. Distillation by solar energy, either by itself or in combination with other practices. Construction of an experimental solar distillation plant covering $\frac{1}{8}$ ac., to produce 600 gal. of fresh water from sea water daily, was planned in 1956 in San Diego, Calif., under the Interior Department program.
3. Boiling at high heat and under pressure, then piping the hot steam back through incoming sea water to preheat the latter.
4. Sieving out the salt or the water by selective membranes, as certain forms of aquatic life sieve out or concentrate within themselves unneeded or needed elements; kelp, for example, concentrates iodine, and a large marine alga cited by Ellis contains a proportion of potassium 42 times as great as in the sea around it, but only one-fifth as much sodium.
5. Putting sea water under electrical tension. Salt dissolved in water separates into its constituent sodium and chlorine ions, which are charged particles, the sodium ion being positively charged and the chlorine ion negatively charged. Since like charges repel and unlike charges attract each other, a tank of sea water may be "sliced up" transversely by a new type of plastic membrane, each adjacent pair composed of one sheet that will allow only negatively charged ions to pass through, and another sheet that will pass only positively charged ions. When the tank is charged at the ends with an electric current, the positive ions



CLOUD SEEDING. Ground generator (at left) releases silver iodide particles into the air at the rate of 30,000,000,000,000,000 a minute. The particles are swept up mountain slopes by normal air currents and updrafts, entering the clouds at 10,000 to 15,000 ft. Reaching the freezing point, they are supercooled and gather moisture to form ice crystals. These in turn are converted to snow, later turning to rain as they fall. Inset shows detail of ground generator

begin to move away from the positive pole, the negative ions from the negative pole. They move until each type meets the membrane that bars its progress, so that the water freshens in one of these narrow slices or cells and grows saltier in the next. The fresher water may be piped off for use and the saltier water discarded as waste.

Such "partial" processes as ion exchange, which freshen water little by little, are more suited to treating water which is merely brackish than is complete distillation. Many types of ion-exchange water softeners are already in use for special purposes, from household units to large industrial installations. The immediate possibilities of the separation processes lie in the fact that the cost of eliminating minerals is directly proportional to the percentage of minerals in the water, and there are large sources of brackish water in the United States which contain too much salt to be usable, but not nearly as much salt as sea water. In many places such waters come so near to the surface that they inhibit crops, and where fresh irrigation water is cheap and plentiful enough, it is often used merely to wash the salts out of surface soil.

Where brackish water contains only a little too much salt to be useful, it may even now be reclaimed at a cost that farmers and city dwellers can pay, in some instances not more than \$5 an acre-foot.

Mining Icebergs

There is another possibility, if only for the future, in taking advantage of work that nature has already done in freshening sea water. This consists in mining icebergs for fresh water. At first glance such a scheme seems fantastic, but it is being seriously discussed as a future possibility. The water frozen in the polar ice caps is fresh water, and there is probably more of it than in

all other surface or underground fresh waters of the earth, some estimates being that the ice on the earth's surface totals several million cubic miles. The ice caps are constantly "calving"—that is, pieces of them are shoved off the continental shelves by relentless crowding from behind—and these float away as icebergs. These bergs may be enormous, especially in the Antarctic, a single one of them weighing billions of tons and containing perhaps up to several million acre-feet of fresh water.

John D. Isaacs of the Scripps Institution of Oceanography pointed out that such bergs often float northward from the Antarctic for thousands of miles on the Humboldt Current. He calculated that the cost of keeping them on this northward course by using ocean-going tugs would be small, compared with the cost of bringing fresh water to the coast of southern California by other means. Once such a berg was anchored off the coast, harvesting the water would be simple. Fresh water will float on top

CLOUD BOILING UP shortly after being seeded with silver iodide



of salt water, so the berg could be surrounded by a watertight fence and a fresh-water lake would form which could be tapped by pipeline from the shore. Isaacs calculated that as fresh water from the atmosphere would also condense constantly on the berg's cold surface, the total yield might thus be considerably increased. Therefore, when the needs of an increasing population press hard enough upon available fresh-water supplies, a fenced fresh-water lake in the ocean may be added to the tourist attractions of southern California.

Cloud Seeding

Another possibility of increasing fresh-water supplies lies in precipitating, if possible, more of the huge volume of fresh water which is freed from the salty ocean by evaporation and which floats over the earth in the atmosphere. Why should man do all the expensive work of purifying water if it is possible to increase the fall of water which is already cleansed by nature? It should be noted, however, that rain water is not by any means absolutely pure. It is rather a very weak mineral soup, since the raindrops sweep down all sorts of particles from the atmosphere. These include a small amount of entrapped nitrogen, which is vital to the growth of plants. In a humid climate, precipitation will bring down several pounds of nitrogen per acre per year, a weak solution, indeed, but perfectly suited for feeding plants. Householders know how much better and faster their lawns and gardens respond to even a light rain than to water laid on with a hose.

An ideal solution of the need for water would therefore seem to lie in the possibility of inducing nature to let down more rain and snow, and a technique has been worked out to do this, called "cloud seeding." Although developed as early as 1946, the concept of cloud seeding is still subject to dispute, but there is increasing evidence that seeding does change the characteristics of clouds and their behaviour. That it may afford a means of changing whole climates and of making desert areas bloom, however, remains a matter for the remote future and awaits a vastly improved technology—if it can be done at all. Man's powers are still too weak and partial to alter the course of the vast currents of air that sweep the sky and that by their clash and interaction bring down rain.

The technique is to watch what nature does and then try to do likewise. A cloud is formed when the air can no longer retain water as invisible molecules in the form of transparent vapour. This is wholly a matter of temperature. Warm air can hold much more water in the vapour state than can cold air. At 90° F. a cubic foot of air can hold approximately $\frac{1}{2}$ oz. of water vapour, while at 32° F. it can hold only about $\frac{1}{16}$ oz. And the atmosphere grows colder rapidly with increasing height, so that at an altitude of several miles above the earth the temperature is colder than zero, even in summer.

But water vapour, to condense, must have something to condense upon (down to about -40° F.), and this is supplied by the invisible particles which are always present in even the clearest air. Cloud is composed of tiny water globules, each condensed on one of these particles or nuclei, and under the right conditions these water globules will further coalesce into raindrops, or freeze into ice crystals, which pull in surrounding moisture and thus grow into snowflakes large enough to fall.

Much cloud floats along in the peculiar state called "super-cooled"—below freezing, yet still liquid. In fact, water droplets will not all spontaneously flash over into ice crystals until the temperature goes down to about -40° F. Vincent Schaefer, formerly of the General Electric Company, found that if part of a cloud can be cooled by any means to a temperature lower than -40° F., snow will form, and that this effect will spread through the cloud. He used dry ice, first in the laboratory and then in the atmosphere. Bernard Vonnegut, a fellow worker, found that



A SMALL MULTIPURPOSE WATER PROJECT in Nebraska. At the top a small storage lake collects water from a larger lake farther away and from nearby runoff, and thus serves somewhat to check against floods. The water is then diverted through the power plant (centre) for the generation of electric power. Finally, the water is released into an irrigation canal which makes it available to farms

crystals of silver iodide (a compound of silver and iodine) are so like crystals of ice that they will "fool the water" into freezing at temperatures much warmer than -40° F., though still below freezing. The most popular present technique of cloud seeding is

to burn silver iodide at high heat in a small furnace on the ground, whence it is wafted skyward in the form of crystals, billions of them each minute. Released according to the operator's skill and knowledge, so as to drift on the winds into an oncoming or forming storm, the silver iodide crystals add greatly to the number of nuclei that nature provides. If rightly placed, they greatly increase the number of snowflakes or raindrops that form, and gravity brings the snow or rain to the ground.

In 1952, by congressional authority, the president named a commission of leading weather experts to investigate the whole subject of weather control. This group reported in 1956 that six out of seven seeding projects it had investigated, all admittedly conducted under very favourable conditions, had increased precipitation variously from 9% to 17%, and that seeding "produces results which are not spectacular or breathtaking, but which can be very important to the water economy of the nation."

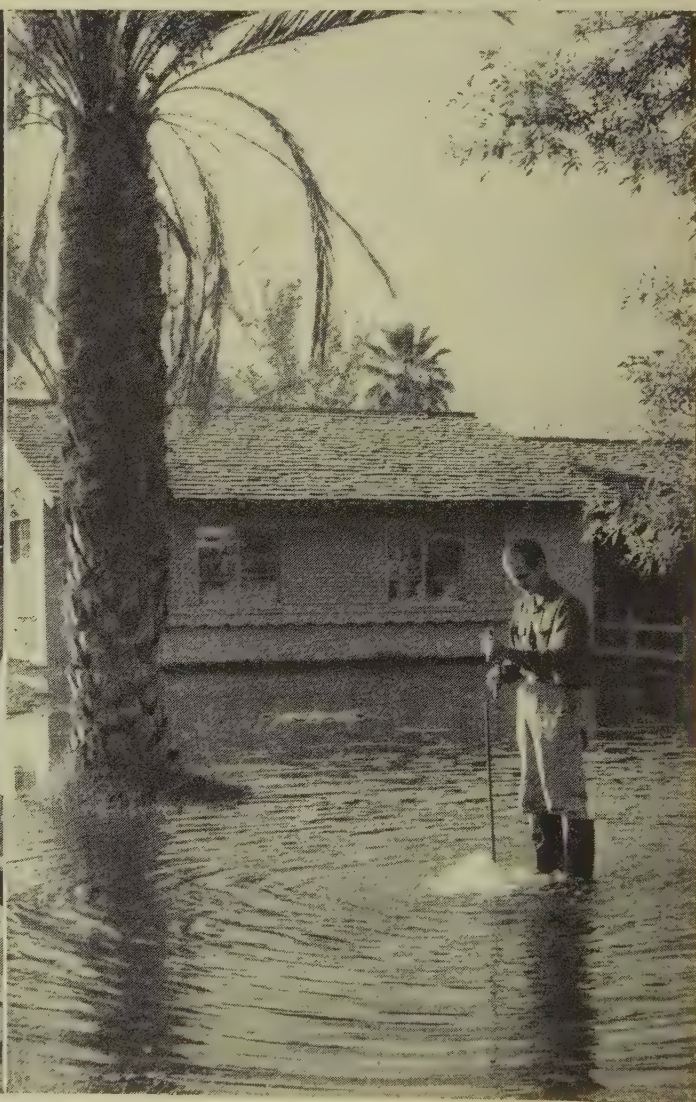
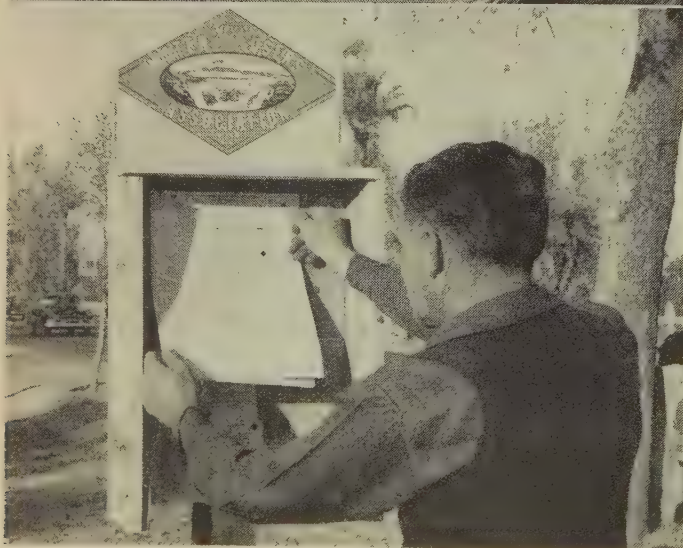
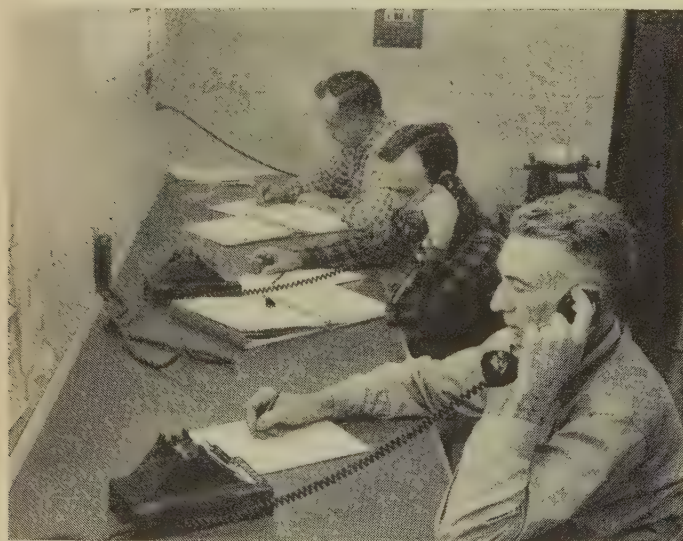
Further, the technique of seeding clouds from the ground is so inexpensive that an economic study conducted under the commission's auspices showed that an increase of 1% in rainfall in semiarid regions will increase crop values enough to pay for a year's seeding. Also, some of the increased precipitation will percolate into the ground or increase the stream flow. One long-continued power company project in seeding a high mountain watershed apparently produced much more than enough extra power to pay for itself and enough extra water to meet the domestic needs of 25,000 to 40,000 persons downstream, an over-all

increase of about 9% in runoff.

Yet it is very easy to overkindle enthusiasm about the possibilities of cloud seeding, as both clients and seeders have found. For one thing, the projects evaluated by the president's commission were all in the most favourable terrain, where moist air currents from the Pacific were forced up and over the mountain ranges. It was relatively simple to station silver-iodide generators right in their path. During 1956 the commission was conducting and studying projects undertaken under greater difficulties.

The behaviour of "warm" clouds is also coming under intensive study. These do not freeze, and air temperatures show that such clouds supply most of the rain for large regions, particularly in the tropics. The specialists believe the seeding agents in these cases are relatively large nuclei, such as particles of sea salt blowing over the continents. Water drops and droplets themselves are also believed to act as seeding agents here, as they are dashed around by the winds in the interior of storms. In Australia, in particular, elaborate experiments in releasing fine sprays of water into the upward currents in the hearts of incipient storms have been followed by apparent large increases in rain.

WATER BY TELEPHONE, an example of supply control as practised at the local level—the water user's association of Phoenix, Ariz. Top left: Operators in the field office receive water orders and notify customers by telephone when water will be turned into irrigation ditches and supply mains. Service on a zone system reduces costs. Bottom left: Service schedule is posted along a roadside. The schedule records the amount of water delivered to users in the area. Right: A home-owner flooding his lawn by releasing water from an underground line. The yard is surrounded by an earth dike, permitting the lawn to be covered to a depth of four inches. Watering is allowed each 12 to 16 days





HOOVER DAM OUTLET WORKS shooting water into the river below the dam. The size and power of the streams of water may be judged by comparison with the group of men riding a skip above the river. On the left and right sides of the canyon walls are parts of the hydroelectric power station

Seeding is studied also as a means of lessening lightning and suppressing hail by "triggering off" rain and thus reducing the potential violence of thunderstorms. It should be emphasized, however, that seeding will not end drought, since a dry sky can produce no rain, and in drought areas the skies are dry. In an area seeded the year around, there might be no more frequent storms, but each storm might produce a little more precipitation.

A National Unified Water Policy Needed

In the physical realm we know what to do, to increase or to conserve the national supply of usable water. But the national difficulty is in deciding to do it and to summon the joint determination to stage a unified attack upon the water problem through an effective national policy. The problem has been studied, in whole or in part, by at least a dozen official national groups and commissions since 1940, including the two Hoover commissions, the President's Water Resources Policy Commission of 1950 and, more lately, by the President's Advisory Committee on Water Resources Policy. Each group has recommended unified long-range policy and practice within the area of its study, be it a

river basin or the continental United States.

Yet we are a long way as yet from such a policy. Must nature make it a condition of national survival before we tackle our water problem as a whole? Why do we lag? It is largely because the problem originally presented itself, and continues to do so today in many aspects, to each person only in terms of his own needs and to each interest in the terms of its own desires.

The New York householder is interested primarily in ensuring that his faucets run healthful water at a price he thinks he can afford, the western irrigator in a sure supply for his fields. The power company manager thinks in terms of enough water to turn his turbines; the industrialist in terms of water as an indispensable raw material, solvent or coolant, and as a convenient carrier-away of his wastes; the transportation man only in terms of its function as a highway, and so on.

Each such interest has attached itself to the water complex at a different point, and as the use by each has grown and the avail-



able water becomes inadequate to supply the needs of all simultaneously, each has at some point found itself face to face with a rival claimant for the same water. Each interest may be represented also by a different governmental unit, federal, state or local, and each such governmental unit has behind it an active lobby of citizens, if the need requires. Most such groups on the national scene maintain offices in Washington, D.C.

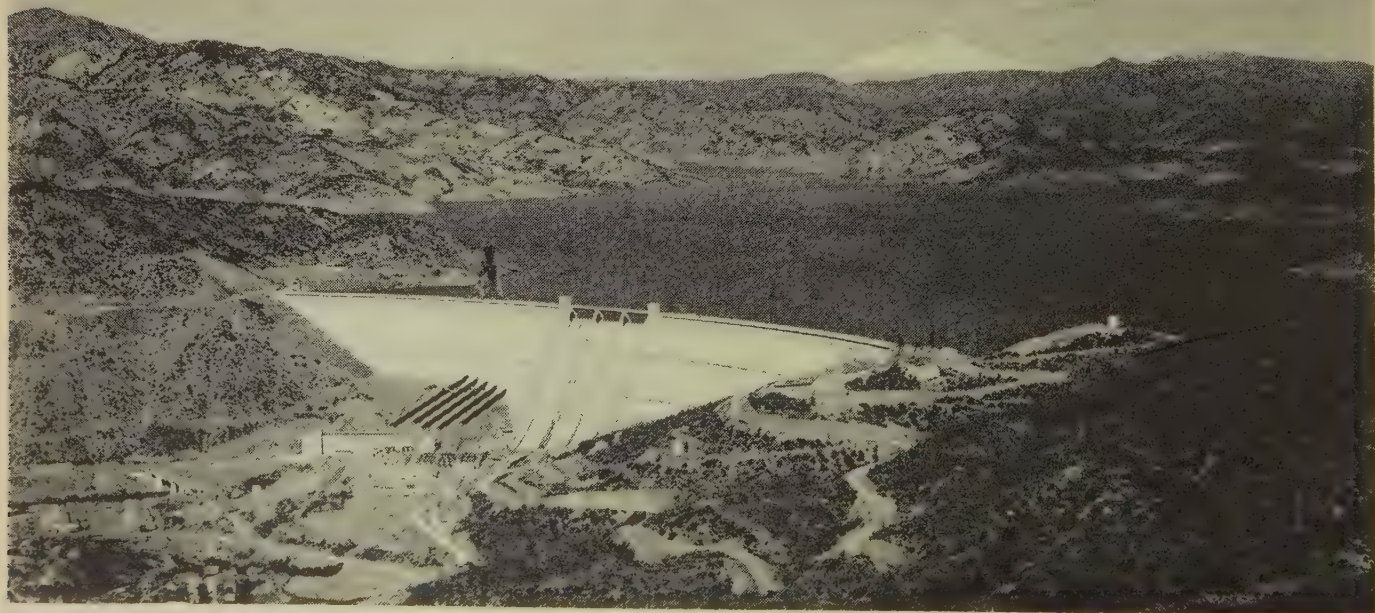
There was a joint water supply service in Boston, Mass., as early as 1652, but it was not until 1875 that the first filtration plant for domestic water was established, at Poughkeepsie, N.Y. By 1956, of the 570 largest community water supply plants, only 14 still distributed wholly untreated water to their users.

Congress passed its first antipollution act in 1886, one that forbade the dumping of sewage and garbage into New York harbour. Although the army engineers had been commissioned to improve navigation at the very birth of the republic, and specific authority to deal with flood problems in single basins had been granted them later, it was not until 1936 that their civil functions were widened to include a nation-wide flood-control program. It was only in 1902, when it was recognized that the resources of private capital and enterprise clearly were no longer able to deal with the growing size and complexity of the works necessary to harness the great rivers of the west, that congress created the Reclamation Service, now the Bureau of Reclamation. And even today its works supply the water, in whole or in part, for only 7,000,000 of the nation's 28,000,000 irrigated acres.

Only in 1935, and then fortuitously to meet a crisis of regional decay, did congress authorize the Tennessee Valley Authority to deal with a river basin and its waters as an organic whole, an example not yet followed in any other large domestic basin (largely because of clashes of various interests as to the division of benefits) although adopted, in whole or in part, in more than a score of river basin projects elsewhere throughout the world.

In 1948 congress passed the first act authorizing the U.S. Public Health Service to deal with interstate pollution, although in a very limited way and in strict subordination to the wishes of the

TWO GREAT DAMS OF THE WEST: Left, Grand Coulee Dam, Washington; below, Shasta Dam, California. Both dams were built for multiple-purpose benefits: flood control, irrigation and electric power. Grand Coulee was completed in 1942; it is 4,173 ft. long, 550 ft. high and has a volume of 10,585,000 cu.yd. The photograph, a view toward the southwest, shows clearly the relationship of the dam and reservoir to some of the land surrounding them. Shasta, located in the mountains of northern California and in sight of the peak from which its name was derived, was completed in 1945; it is 3,460 ft. long and 602 ft. high





FONTANA DAM, Little Tennessee River, North Carolina. Fontana, a key dam in the Tennessee Valley Authority system, was completed in 1944. It is 2,385 ft. long and 480 ft. high. The dam serves for flood control and navigation purposes as well as furnishing power at a capacity of 202,500 kw.

states—those which originate pollution as well as those which suffer from it. In 1954 came the Watershed Protection and Flood Control act, which sought, though also in a limited way, to authorize and to encourage the efforts of local citizens and organizations to protect watersheds “from the top down.” Both these acts were extended and strengthened in 1956.

Other federal agencies which have important water supply and water conservation functions include the Department of Agriculture, largely through the Forest Service and the Soil Conservation Service, and the Department of Interior, through both the Bureau of Reclamation and the Geological Survey. The latter has since 1888 been compiling data on surface-water supply and since 1895 on ground waters. Its statistics and its engineering and geological studies are by now literally beyond price; there would be no means of attacking water problems nationally if it were not for them. But still more data are needed.

The Weather Bureau measures and forecasts precipitation and thus deals with expected supply. Scores of other federal agencies, for example the Bureau of Indian Affairs and the National Park Service (both of the Interior Department), deal with water in ways that are contributory to their main functions but that are nonetheless often locally and nationally significant.

Each state has established an agency, or sometimes several, to deal with water supply and to enhance water conservation. In most instances such agencies were originally created to deal with a single phase of the water complex, as the federal agencies originally were. Disputes among classes of users are repeated within states as well as nationally. If the states, particularly the 17 western states, may be said to have a water policy in common, it is the assertion of complete state authority over water resources, together with incessant demands for federal aid. States both co-operate and compete with each other and with the federal government in demanding, husbanding and developing this vital resource. In various parts of the nation, those states which share a single river basin have formed organizations among them-

selves, all the way from loose compacts to effective and close-knit administrative agencies. In some regions, particularly where water is scarce, it sometimes seems that interstate compacts were formed chiefly for the purpose of more effective interstate feuding; but in other instances they are very useful co-operative organizations.

Multipurpose Dams

Physically speaking, the most important development relating to water in the United States during the 20th century was probably the multipurpose dam, as the final evolution of that prehistoric line of stones across a brook. Most dams before this time were single-purpose ones; that is, each was set down at a single point in a river for one particular purpose, such as flood control, navigation, power development, domestic water supply, irrigation, etc. But planners and engineers evolved the idea of dams high enough, long enough and with reservoirs capacious enough to serve several such purposes at the same time. Such a dam typically has space assigned to store the silt that comes down the river, to control floods and to store water for such specific purposes as irrigation, domestic supply or the generation of power. It might be characterized as an all-purpose valve controlling a whole river. The great modern dams—Hoover, Grand Coulee, Shasta, Fort Peck, etc.—are all multipurpose structures.

But to store a very large quantity of water at a single point requires a dam either on the main stem of a river or on a major tributary, and usually well down the tributary. This seems natural and right to the people downstream, who profit from a regulated flow from above, but it often appears in a different light to people upriver, and from this derives one of the great and growing conflicts in United States water supply policy.

If it were possible to find a wholly virgin river basin without

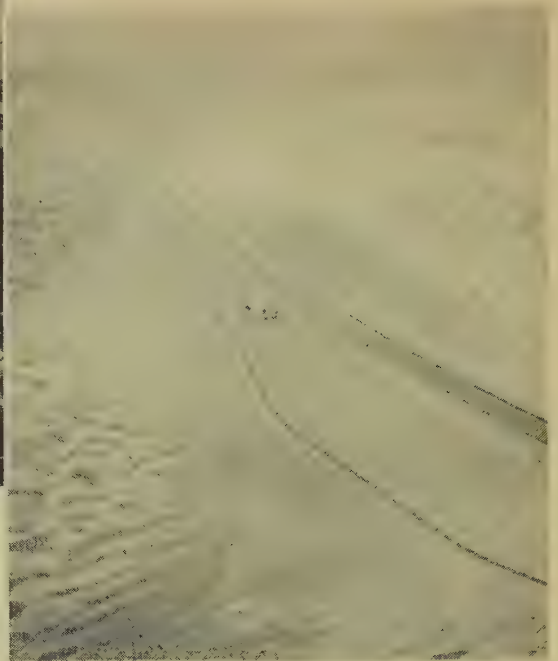


Above: Contrast of sagebrush wastelands and fertile, arable valley irrigated from the Yakima River near Prosser, Wash.

IRRIGATION

In the 1950s irrigation and industry accounted for about four-fifths of the 200,000,000,000 gal. daily consumption of water in the U.S.

Right: All-American canal, which carries water from the Colorado River to irrigate the Imperial and Coachella valleys of southern California. The photo shows the canal crossing the desert west of Yuma, Ariz.

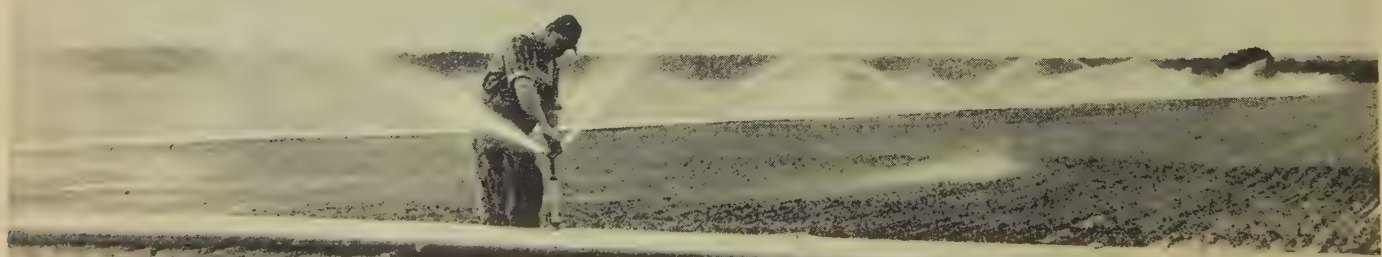


Above: Siphon tubes delivering water to a Nebraska cornfield. Dam in the foreground regulates the water so that it is evenly distributed to each row



Right: Canal tender, or "ditch rider," adjusting flow of water in irrigation canal of the Salt River project, Arizona. Water from the canal is applied to fields either by direct flooding or by methods such as siphoning or sprinkling

Below: Farmer adjusting valve on sprinkler irrigation system. Sprinklers operate under pressure, and extra power is usually needed for this type of irrigation



a single human inhabitant, and to study and shape it from the beginning with an eye to the most valuable development of its water resources, and then to settle the people where they could take best advantage of those resources, the place to begin would be at the top of the basin, far back in the mountains or hills. There would be two reasons for this: First, the relatively narrow and deep canyons of the upper basin are best suited for water storage, since their depth would minimize evaporation as compared with a wide flat valley downstream; they are also less suitable for intensive human settlement. Second, stored water is as a general rule available only below the point of storage, and by this device most of the water would be contained above the points of use.

But development does not in real life proceed in that fashion. Storage is more immediately beneficial near the point where people need to use or control the water. Human settlement proceeds inward from the seacoasts, and the big cities and populous rural districts grow up around the estuaries and in the plains downriver. The people there begin using the water where it is, and by the time water planning and upstream settlement have begun, the downriver people have established what they claim as vested and prior rights in the water supply, and they often assume to dictate for their own purposes the development and the uses of the whole stream.

Feuding Over Water

This priority of settlement is the essential cause of most of the country's river basin disputes. Some have become so acrimonious as to resemble cold civil wars, as in the Colorado basin. The people at the top of the watershed refuse to be left out, and they reinforce their refusal with every economic and political weapon at their disposal. Such priorities are also at the bottom of local water feuds, and, particularly in the west, there is a saying that more men have been shot over water than over gold. Every irrigation project must have a water master to resolve disputes. (There is a western story of a lawyer who heard that a certain interstate water dispute had been settled, whereupon he sighed and said, "Too bad. It put my father through college, it put me through college, and I was counting on it to put my son through college.")

There have also been feuds between federal agencies themselves. As the army engineers worked upstream from the coasts and the Bureau of Reclamation worked downstream from the mountains, for example, they eventually found themselves presenting elaborate and rival plans to congress for development of the same basin. This was resolved by the Flood Control act of 1944, which ended, at least on the surface, the most famous of these feuds, that over the Missouri River basin. This act allotted the army engineers control over dams for flood control and navigation purposes, gave the Bureau of Reclamation control over irrigation functions and gave the Interior Department control over the sale of electric power. In the case of the Missouri River itself, the act reserved its waters originating west of the 98th



UPSTREAM CONTROL PROJECT constructed of earth and timber. The sandbags and planking become more effective after underwater vegetation growth and siltation fill in. Adjustable spillway permits regulation of flow

meridian primarily for western domestic and irrigation purposes.

Much progress has been made in resolving jurisdictional difficulties, and state, federal and local agencies are learning to operate more effectively together. Perhaps the largest remaining area of confusion and conflict lies in the status and development of ground water. The nation has never made up its collective mind where jurisdiction of such waters should lie: whether they are always attached to a surface water system, and therefore should come under the rules governing the distribution of surface waters; whether they are owned by the owner of the surface; or whether, like oil, they are "wild" and subject to capture by the first comer to put down a well.

The usual story is that the first group to tap a ground-water deposit thereupon attempts to assert a vested right in it and resists attempts to impose state rules, meanwhile opposing the attempt of later comers to tap in on the supply. Most states, particularly in the west, have attempted to enact ground-water codes, but where these exist they usually lack enough authority to exert much effect upon the conservation of ground water. South Dakota in 1955 succeeded in establishing a law based on complete state ownership and requiring a state licence to put down a well, but this is an exceptionally strong law.

Upriver Revolts

One interesting aspect of the past few years concerns what might be called the revolt of the upstream folk. As has been noted, river development has been largely in behalf of downstream users, through big "main stem" dams. The news that is published of disastrous floods, as in 1951 and 1955, centres largely upon the damage to populous towns and downstream industries, while upstream damage is largely unreported.

For example, the picture that the nation got of the great Missouri basin flood of 1951 that centred in Kansas was largely concerned with broken levees, flooded cities and damaged industries. But the Soil Conservation Service concluded after a special study of this flood that the upstream damage—ruined farm struc-

tures and standing crops, fields ruined by erosion or sanding, rich topsoil carried away—reached the appalling total of \$400,000,000, or more than all downstream damage. The Department of Agriculture in general, and the Soil Conservation Service in particular, have long laboured to focus national attention upon the problems of upstream dwellers, especially those of farmers. Their thinking and that of their adherents went as follows:

Every person in the United States lives in a watershed, from a hundred square feet to several acres in area, which drains into a larger shed, which drains into a still larger one. All large watersheds and major river basins, therefore, are made up of a system of much smaller sheds which fit together like the pieces of a jigsaw puzzle.

Now, say the upstream dwellers, give the people of each local shed the encouragement, the planning and some of the means to stop the water where it falls, through terracing, through contouring, through keeping the soil in good organic state to hold water and covered with protective vegetation, etc., and to build small retaining and retarding dams at key points so as to reduce violent runoff. Do this watershed by local watershed, and this will eventually solve the water problem of the whole major basin.

The advocates of this method met at first with violent opposition, but great success has been claimed in retaining water in the land and in cutting down flood damage in pioneer projects of this nature in Oklahoma, Nebraska and elsewhere. Supporters finally succeeded in 1954 in getting congress to pass the Watershed Protection and Flood Prevention act, which congress amended in 1956. The original act hedged small watershed projects about with many reservations and limitations. Despite all these barriers the act proved so popular that by the end of fiscal 1956 the Soil Conservation Service had received nearly 500 applications for assistance from 46 states, had authorized 164 projects for planning in 44 states and had submitted 13 specified work plans to congress. Costs in most such instances are divided about equally, between the local people and the federal government.

The National Prospect

As of 1957 the national prospect is that the problem of water supply will from now on force itself increasingly upon the nation. More ingenuity and human effort than ever before, plus a greater proportion of the national income, must be spent on water. The prospect is for greater emphasis on developing the water supply for domestic and industrial use, and for relatively less emphasis on new, large-scale irrigation developments and on the use of water to develop power. In the realm of government, the outlook is for an increasingly closer approach to a truly national water policy.

The United States has developed into the most complex and highly advanced material civilization on earth. To maintain its standards, the nation must pay increasing attention to developing sources of raw materials, of which water is probably the most universally necessary. The measure of our wisdom in regard to water may well measure our future material advance. The passage of time will reveal whether our ingenuity is capable of meeting the challenge, to increase the manageable water crop sufficiently to supply our needs for the future.

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The Philippine Republic: A Decade of Independence

By **ALBERT RAVENHOLT**

UNITED STATES concern with the less developed countries of Asia, Africa and Latin America often assumes that Americans can make a major contribution toward their advancement. It is an assumption that merits examination in detail in this era that has seen county agents from Iowa working in India and teachers from Michigan assisting the Okinawans. More than half a century ago—long before the world had heard of Point Four and United Nations technical agencies—hundreds of American school teachers went into the barrios, or villages, of the Philippines to help the inhabitants of those Islands build a new way of life. This “experiment” has been the major intensive United States effort at helping another people achieve progress. Joined to the aspirations of the Filipinos, it led in time to the creation of the Philippine Commonwealth and the establishment of the independent Republic of the Philippines in 1946. Now ten years after the birth of this new nation it is possible to distinguish the first beginnings of Filipino achievements under their own leadership, some of the problems that lie ahead and the extent to which they have found useful their co-operation with Americans and others.

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The author is much indebted to the dean of American scholars on the Philippines, Dr. H. Otley Beyer, who gave generously of his learning but is not responsible for any statements made herein.

NATIONS, like individuals, experience especially formative years, and for the Philippine republic the decade marked by its tenth anniversary on July 4, 1956, was such an era. It was a time of trial for Filipinos, whose independence from the United States came as they were emerging from the ruins World War II had left them. Pent-up desires from years of Japanese occupation and privation were indulged in a heavy buying spree made possible by guerrilla back pay and war damage and other payments from the United States totalling almost \$2,000,000,000. But wrist watches and new automobiles reaching Manila failed to still smouldering discontent among the ordinary rural folk, who were bound by an often primitive agriculture and an archaic land tenure system. Exploiting this raw material and using arms the war had left behind, the Communist Hukbalahap leaders staged a rebellion and for a time set aside government in large sections of the main island of Luzon. The resistance legacy of defying authority also led politicians in the capital to flaunt their corruption and encouraged the little man who could get away with it. These elements all conspired to subvert for their own ends governmental administration and the electoral process.

The decade was equally one of triumph for the young republic of the Pacific tropics. Confronted for the first time in more than four centuries with the opportunity and need to make decisions fully their own, Filipinos showed commendable good sense. Most

of them channelled their dissatisfaction with the character of government into creative political action, and the ballot box became the instrument for change. In re-establishing rule by law and by fairly chosen representatives, the nation began to discover that its democracy must also be economic and social. While workable solutions proved elusive, a new generation of leaders emerged who expressed the acute “felt needs” of average citizens, including a president of rare energy, Ramón Magsaysay. Divisive issues concerning the role of religion in schools and politics and the right of “alien” Chinese to do business tested the tolerance of these people. It was a period when the “mould was being set” within which Filipinos would evolve their national destiny.

Among the new nations struggling for self-realization in the teeming world of south and east Asia the Philippines has a special place. Because it is the only predominantly Christian country in this region and its people have borrowed much of their practices of government and life from Spain and the United States, the island republic is watched critically by its Asian neighbours who now are choosing their styles in political fashions. Its strategic role is attested by the presence of some of the largest United States naval and air bases in the Pacific.

The great natural wealth of land, minerals and timber of the Islands could promise a bountiful future for Filipinos and help fill the urgent needs for raw materials of such overcrowded industrial societies as Japan. In the insistent councils of the countries newly liberated from colonialism, the Filipinos are becoming a moderating influence that may help bridge the gulf of bitter experience dividing East and West.

While filling this unique role, the Philippines remains a land of great contrasts. Greater Manila with its 2,500,000 residents is home to more than one out of every ten Filipinos. It is a 20th-century metropolis complete with air-conditioned hotels along Dewey boulevard, plush motion-picture theatres, supermarkets and traffic jams. Only 30 miles distant, within sight of this sprawling port city, are the unexplored jungles of the Sierra Madre. On the 158,000-ac. Clark Air Force Base—Fort Stotsenburg military reservation in central Luzon, where the U.S. air force bases its jet fighter planes and B-52 intercontinental bombers, Negrito tribesmen still hunt with their bows and poisoned arrows. The Quezon City millionaire with his palatial Spanish-style home, swimming pool and Cadillac in Manila's suburb feels little in common with the ordinary *tao*, or peasant, who usually lives in a one- or two-room bamboo house, perched on stilts and thatched with leaves



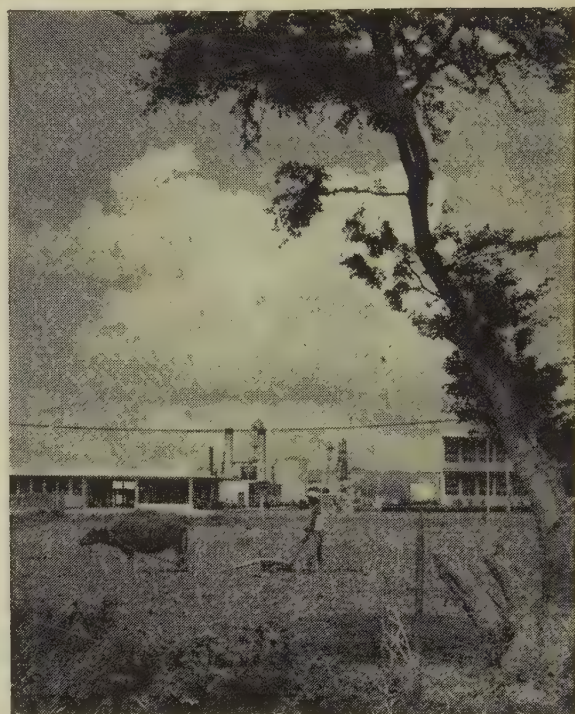
Above: Primitive Igorot hunter of northern Luzon



Above: The 20th-century Filipino, a blend of many races

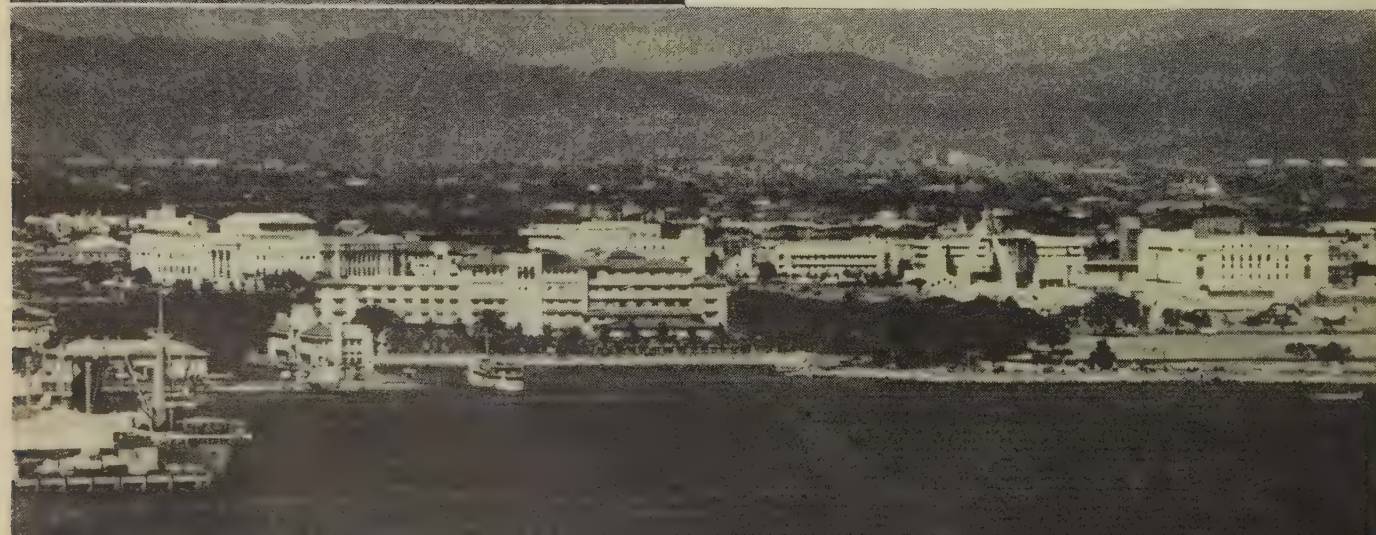
LAND OF CONTRASTS

Below: Typical thatched-roof houses of Philippine rural areas



Above: A Filipino farmer working his field with carabao-drawn plow across the street from a modern petroleum refinery

Below: The water front of Manila, capital of the Philippines and one of the most modern cities of the East



of the nipa palm. Moro sultans of the Sulu archipelago and Lake Lanao plateau who make pilgrimages to Mecca are scornful of the predominantly Christian Filipino community, most of which looks to Rome. While English is the chief language of government and education, 70 different mother tongues are spoken throughout this geographically fragmented country of more than 7,000 beautiful islands that extend for 1,200 miles between Formosa and Borneo.

Ten years after the Stars and Stripes were hauled down over these islands, Filipinos and their friends are taking stock of what independence so far has meant. They are concerned with how well Filipinos have succeeded in welding a nation from such diverse components. How has democracy fared in the land where the United States sought for nearly half a century to implant its ideas of government? What does the Philippine experience mean for the future of this region of Asia and the Pacific where live the world's great majority of awakening and uncommitted peoples? Can Americans and others learn guides to action in co-operating with less-developed countries by examining here the handiwork in nation building? Before considering these questions we will review briefly the history of this land and its people that provides the stuff with which Filipinos are working.

The Island World

Few people are more the creatures of their geography than the Filipinos, and the republic they are building is profoundly influenced by its setting and physical character. Filipino temperament, customs, problems and aspirations are conditioned by the land where they have taken form. And their relationship with Japanese, Chinese and other neighbours in part reflects nature's great bounty to the Philippines.

Together with Formosa on the north and neighbouring Indonesia on the south, the Philippines in ancient times were looked upon as a world by themselves. It was first brought to the knowledge of Europeans in the 13th century by the traveller Marco Polo, who speaks of the eastern part of the China sea as "containing 7,459 islands" and being frequented by many Chinese and Arab ships and merchant traders "who spend their lives in navigating that sea." This first account is so informative that another paragraph may be quoted:

Within this sea there are innumerable islands, almost all well-peopled, and in these is found a great quantity of gold dust which is collected from the sea where the rivers discharge. There is copper also and other things that are peculiar to their respective islands.

They have also a traffic with the people of the Mainland, selling them gold and copper and other things, and purchasing, in turn, what they stand in need of. In the greater part of these islands, plenty of grain grows. This sea is so great and inhabited by so many people that it seems like a world in itself.

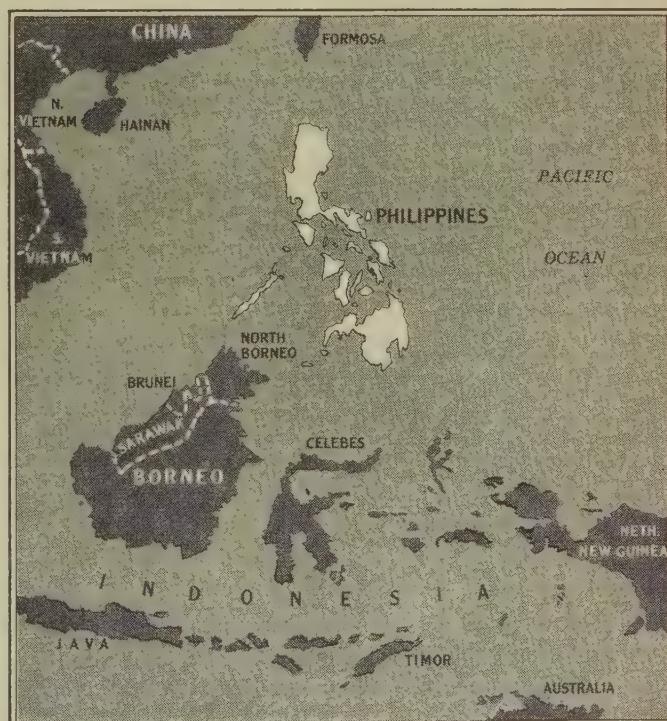
Actually, by modern count, the Philippines alone have 7,100 islands. They lie between the 5th and 20th parallels of latitude north guarding southeast Asia from the Pacific. In total area occupied the archipelago covers about 700,000 sq.mi., of which about 115,600 sq.mi. is actual land surface. It roughly equals in size the British Isles or the New England states and New York combined. The Islands have a total coast line almost as long as that of the United States. It is a land of bold topographical variety and brilliant colour contrasts; the dark green of the tropical forests and the pattern of the coconut palms is silhouetted against gleaming white and black sand beaches and emerald waters so clear it is often possible to see to a depth of 60 or 70 ft. Nearly two-thirds of the land is on the two largest islands which form the northern and southern anchors of the archipelago—Luzon and Mindanao. Luzon is dominated in the north by high, rugged mountains reaching to nearly 10,000 ft. and the cordillera of the Sierra Madre along the east coast that often drops straight into the Pacific. These ranges break down to form the narrow and periodically dry northwestern Ilocos coastal strip and the north-

eastern Cagayan river valley, where rigs now are drilling for oil. The intensively cultivated central Luzon "rice basket" or plain begins at Lingayen gulf and opens onto Manila bay and its extensive fresh-water neighbour, Laguna de Bay. On the southerly Bicol peninsula is one of the most perfect volcanic cones found anywhere in the world, Mt. Mayon, easily seen from the old port of Legaspi.

Mindanao, the "frontier" island to the south, is believed by some scientists to be comprised of five separate islands that merged through geologic action. Two 10,000-ft. volcanic formations dominate it: Mt. Apo, in the southeast, and Mt. Ragang, not far from the 2,200-ft.-high Lake Lanao which fills the cone of an enormous extinct volcano. Other smaller and usually inactive volcanoes throughout Mindanao add their profiles to the landscape. Two areas particularly attract Westerners—the cool uplands of Lanao and the rolling grasslands of the Bukidnon plateau, which are among the finest examples of tropical highlands. In northeastern Mindanao the lush Agusan river valley is now being developed, and in the south-central section the wide and fertile Cotabato plain offers a tempting opportunity for pioneers.

Nine other islands of principal importance to the Philippines range in size from 1,250 to 5,000 sq.mi. each. These include the coconut-producing islands of Leyte and Samar, where liberating United States forces landed in 1944. Cebu, the long, narrow "central island," lifts its almost treeless, razor-backed ridges out of shallow seas. Bohol nearby is dotted with curious limestone mounds. Sugar-rich Negros is dominated by its volcanic skyline, the largest formation of which is Mt. Canlaon, intermittently still active. Panay and Masbate have rolling landscapes that are largely grassland. Less well-explored are Mindoro and Palawan with their extinct volcanoes forming the backbone of islands that face the South China sea. Another 455 islands range in size from 1 to 500 sq.mi. each. The Philippines also has often beautifully sculptured smaller islands, few of them measured as to actual size, which are of so little significance to the life of the country that about 4,000 of them have never been given names.

Although connected to the Asian mainland by land bridges most recently during the Ice Age (Pleistocene), the Philippine



THE PHILIPPINES AND NEIGHBOURING COUNTRIES



MT. MAYON, one of the most perfectly shaped volcanoes in the world, rising more than 7,900 ft. above the port of Legaspi, Luzon Island

Islands, except Palawan and its smaller neighbours, do not constitute a true extension of the Asiatic continental shelf. The Islands are the higher portions of a partly submerged mountain mass of tectonic and volcanic origin; they were lifted up from the ocean floor as crests of anticlinal folds and as upthrust blocks caused by faulting, or formed from ashes and lavas spewed forth from numerous volcanoes. The process still goes on. More than 40 volcanoes today are more or less active. New islands are being thrust up out of the Pacific ocean and sometimes recede again. Others are being enlarged as the volcanic debris is carried down by streams and deposited near the periphery.

Luzon, Mindanao and Panay are continental type formations; they have coastal ranges that reach considerable altitudes, interior valleys and, consequently, substantial rivers. The other eight large islands lack significant rivers and must be classed as true islands. It is the submerged land masses and craters near the surface in the intervening seas between these large islands that have provided the foundation for the growth of numerous coral islands, atolls and fringing reefs.

The Philippines occupy probably the sharpest break anywhere on the earth's surface. To the southeast is the Mindanao deep, where water extends down about seven miles from the surface of the ocean. Nearby mountains of eastern Mindanao rise to almost two miles. Like other islands on the western rim of the Pacific from Japan to New Guinea, the Philippines experience violent activity in the earth's crust, and earthquakes regularly shatter this part of the world. Over eons of time, the process has created scores of fault lines, some running through the entire archipelago. A sector of one of the largest can be seen in the bottom of Ragay gulf off southern Luzon from planes flying at an altitude of 2,000 to 3,000 ft. It is this extensive faulting and shattering of the land masses that has given the Islands their numerous mineralized veins. Rich deposits of copper, gold, silver, lead, zinc and other minerals are some of the major and, so far, little-explored sources of natural wealth for this young republic.

Extensive prehistoric and recent volcanic activity has provided the Philippines with some of the finest soils on the planet. Unlike

many tropical soils, such as those of the Congo and the Amazon river valley, that have lost much fertility through leaching, the Philippines have much soil still sufficiently new to have retained most of the mineral elements disgorged by volcanoes or deposited in alluvial formations. There are perhaps 30,000,000 ac. of arable land, of which an estimated 16,500,000 ac. is now cultivated.

Over the Philippines the normally light to moderate winds carry moisture throughout most of the year, providing a heavy rainfall usually in the form of intense showers. Of prime importance are the monsoons. During the summer months the monsoon winds move in from the southwest, bringing rain to the western sides of the Islands, and during winter months the northeast monsoon waters the eastern slopes. Interior valleys have less pronounced seasons and some moisture throughout the year. Nature's wrath is most felt when typhoons strike, often with centre winds of more than 100 m.p.h. Typhoons regularly sweep from the areas of the Pacific around Guam westward against or near the Philippines. Then they pass on north and west to strike other island areas of Okinawa and Formosa, and sometimes spend themselves on the China coast. With them come drenching downpours, the summer capital of Baguio, nearly a mile above sea level in northern Luzon, having recorded up to 47 in. of rainfall in 24 hours.

These influences of soil and weather combine with warm sunshine to give the Philippines an exceptionally varied flora and fauna. More than half the land area is covered with rich forests and dense jungles that reach in places from the water's edge to the crests of the mountains. The stand of timber is estimated at 446,000,000,000 bd.ft. and is possibly the greatest single natural resource of the republic. There are about 65 commercial species of timber including those now finding favour abroad under the name of Philippine mahogany. The broken surface of the Islands has encouraged a diversity of climate and a rich differentiation among the species. Approximately 1,000 native orchids have so far been identified, and more than 15,000 flowering plants.

THE PHILIPPINES: Location of principal islands and cities and other places mentioned in the text. Distribution of population is indicated from those areas shown in white, where population is sparse, to the darker grays, showing more densely settled regions



LUZON

STRAIT

LUZON

Baguio

Quezon City

Manila

CORREGIDOR

Laguna Bay

Legaspi

MINDORO

MINDORO STRAIT

CALAMIAN ISLANDS

PANAY

Iloilo

Bacolod

NEGROS

CEBU

Cebu

BOHOL

MINDANAO SEA

SIQUIJOR

Lake Lanao

MINDANAO

Davao

Zamboanga

Basilan

SULU ARCHIPELAGO

BORNEO

CELEBES SEA



THE SINIGUELES, a tropical fruit tree of the cashew family. Before budding and producing its fruit, the *siniguel* sheds its leaves, thus appearing barren at the moment of its greatest activity. The sweet, juicy fruit is relished by Filipinos

The Islands once were inhabited by the larger forms of wild animal life characteristic of mainland Asia, including elephants and rhinoceros. But these have become extinct. The only large wild animals presently found are the fierce cattle, or tamarao, on Mindoro and a wild buffalo not much different in appearance from the domesticated carabao. Prevalent throughout the Islands is the wild pig, a curse to the farmer, particularly on the frontiers. Small deer are found in abundance in uninhabited areas. Snakes range from pythons that have been measured up to lengths of 34 ft. to cobras with poisonous venom, and sea snakes are plentiful. Among the 750 species of birds are some of brilliant plumage, and the famed monkey-eating eagle.

Sea life includes the dugong, or sea cow, a tropical mammal whose body sometimes measures 12 ft. in length. There are giant sting rays, up to 17 ft. across, much feared by fisher folk. More than 2,400 different species of fish have been identified, including many of commercial interest as well as the smallest found in the world, *Pondoka pygmaea*. Within the Sulu sea are islands noted for the millions of eggs of the green turtle *Chelonia mydas*, gathered there annually. Nearby are the Snake Islands, reputed to be those visited by Sinbad the Sailor in his travels as recounted in the *Arabian Nights*. There serpents from the South China sea come in to lay their eggs in such profusion that snakes are every-

CARABAOS wallowing in a Luzon mud hole. The carabao, a domesticated water buffalo, is the principal work animal of the Philippines



where within a few feet of each other. Not far away lie the oyster beds that are famed for producing the Sulu pearls.

From the Philippine region come many of the waters that join to form the Japan current and move across the North Pacific and down along the western coast of North America. Filipinos with some justice can claim that the salubrious climate which makes possible present forms of life and habitation from British Columbia to northern California depends in no small measure upon heat the sun deposits on the Philippine seas.

The Filipino People

Throughout this archipelago today live nearly 22,000,000 Filipinos, and their numbers are increasing at the rate of approximately 500,000 annually. One out of every ten is resident in Manila and its suburbs—the buoyant commercial, political, cultural and educational capital of the republic where important careers and decisions usually are made. Most Filipinos, however, live scattered throughout about 800 of the larger inhabited islands; a small proportion dwell in provincial towns and ports, but Juan de la Cruz, or Mr. Average Citizen, resides in one of about 20,000 barrios, or rural communities. This population is concentrated in two regions. The central Luzon plain stretching north from Manila bay is overcrowded, as are portions of neighbouring Batangas and Laguna provinces and sections of the Bicol peninsula to the south. The densest inhabited area is along the narrow Ilocos coast—the province of La Union has 1,400 residents per square mile. The second major grouping of people is in the central Visayan Islands, particularly on Cebu, Bohol, Leyte, Siquijor, Negros and portions of Panay and Masbate. Cebu, for example, with approximately 700 sq.mi. of land area, is home to considerably more than 1,000,000 persons. It is from these two areas of primary population concentration that have come the tens of thousands of Filipinos who opened new lands on neighbouring islands or migrated to Hawaii and the continental United States.

Much sparsely settled land remains, however, and it is estimated that with proper development the Philippines could support five times its present population at a higher standard of living than at present.

Citizens of this republic are evolving into a new ethnic type that some anthropologists have named the "Filipino blend." It is a mingling of the many peoples that over the centuries migrated into the Philippine Islands, and combines characteristics of major ethnic stocks including the Mongoloid, the Caucasian and a little of the Negroid. The first known human inhabitant of the Philippine Islands lived about 250,000 years ago—a primitive type similar to the Java man. His stone implements have been found in Rizal, Bulacan and Batangas provinces. This early man, accompanied by the *Stegodon* elephant and the rhinoceros, had wandered in over the land bridges that then connected the Philippines with Borneo, Sumatra, the present area of Malaya and the Asian mainland. He became extinct, so far as scientists can judge, before the time of the last glacial period, coincident with the disappearance of most large mammals.

The earliest ancestors of the present Filipinos reached these islands about 25,000 to 30,000 years ago, also arriving over the land bridges. They were the dark-skinned ancestors of the present pygmy Negritos, whose adult men stand to a height of from 3 ft. 10 in. to 4 ft. 8 in. Another migration of people followed about 10,000 to 15,000 years ago over the same land bridges—a Proto-Malay or short Mongoloid people. They possessed the blowgun and bows and arrows and practised a crude kind of dry agriculture in forest clearings. Shelters of tree branches and leaves were built by them, and they probably wore primitive clothing and ornaments made of barks and leaves. Anthropologists have estimated that together these two migrations contrib-

uted perhaps 10% of the blood strain of the present Filipino population.

The first seafarers of which there is record crossed the horizon of Philippine history from the north about 5,000 to 6,000 years ago. They had learned to make and sail sturdy plank boats. These early New Stone Age people carried polished stone axes, chisels and other tools which tell, archaeologically, of an advanced culture and craftsmanship. They practised dry agriculture, constructed rock and stone walls around their homes and lived in grass-covered houses with wooden frames and rounded roofs, much like a modern Quonset hut, built directly on the ground over yard-deep pits. These early Neolithic or Indonesian "A" men were tall and slender and added an estimated 12% of the present stock.

A second wave of immigrant seafarers started arriving about 2000 or 1500 B.C. from Indochina and south China, and their influx continued for perhaps a millennium. This is known as the Indonesian "B" or late Neolithic migration, and it contributed roughly another 18% of the "ethnic mixture." Between 800 and 500 B.C. a smaller migration with a Copper-Bronze culture arrived. They also carried jade and small tools and introduced irrigated rice culture, building the first terraces, but contributed at most 3% toward the ancestry of the present population.

The last prehistoric migration, occurring between 300 and 200 B.C., brought from the south the most numerous and advanced influx, the Malays with their Iron Age civilization. They are responsible for an estimated 37% of today's ethnic composite. These people travelled in fleets of dugout boats from the west coast of Borneo to Luzon by way of Palawan and Mindoro, and along the Sulu Islands to Mindanao and the Visayas. In addition to advanced lowland agriculture, they introduced new industries such as pottery-making, weaving, glass and metalworking and the manufacture of improved tools and weapons.

The blood strain was also enriched in historic times. Arab and Indian merchants reached the Philippines about the beginning of the Christian era and continued to trade throughout these waters, and occasionally settle on the islands, for almost 1,000 years. They were followed by the Chinese, who, beginning with the southern Sung dynasty in 1127, developed extensive trade with southeast Asia, particularly with the Philippines, coming in search of rare woods, rattan, pearls, cotton and prize delicacies such as bird's-nests. The Chinese established colonies along the coast and later in the cities and left their ethnic stamp upon the population. With the arrival of the Spanish and Americans, a substantial Caucasian element was introduced. Altogether ethnologists estimate these historic arrivals have added perhaps 20% to the present blood stock of the Filipino people.

This varied ancestry is reflected in today's Filipino; while generally brown-skinned and of medium stature, he is not true to a single physical type. Most men and women have straight black hair, typical of the Mongoloid or Malay. But some families have children with long wavy locks characteristic of the Indian or Spanish, and, occasionally, a head of tight black curls suggests

some Negroid ancestry. The comparatively light skin found in many families and admired by Filipinos in their babies is usually indicative of European progenitors. There is evidence of hybrid vigour, particularly among the men. Folklore holds that certain ethnic mixtures have greater prospects of success in life. For example, a wealthy man who has made and kept his money is usually credited with a strain of Chinese blood. Blending of the races in these islands produced women who, by Western standards, are judged among the most attractive in Asia. They have the small bones of the oriental but with the fuller figures and sharper facial features the West admires.

The complex origin of the present Filipino people is manifested by the numerous native languages now in use. There are about 55 different ethnographic groups speaking a total of 70 or more languages and dialects that divide into 137 subdialects. These languages emerged as the successive waves of immigrants to the Philippines added their forms of speech to those of the earlier inhabitants, and verbal differentiation resulted as settlers on an island or in an isolated mountain valley evolved terms to fit their particular environment.

However, today about 88% of the population has, as a mother



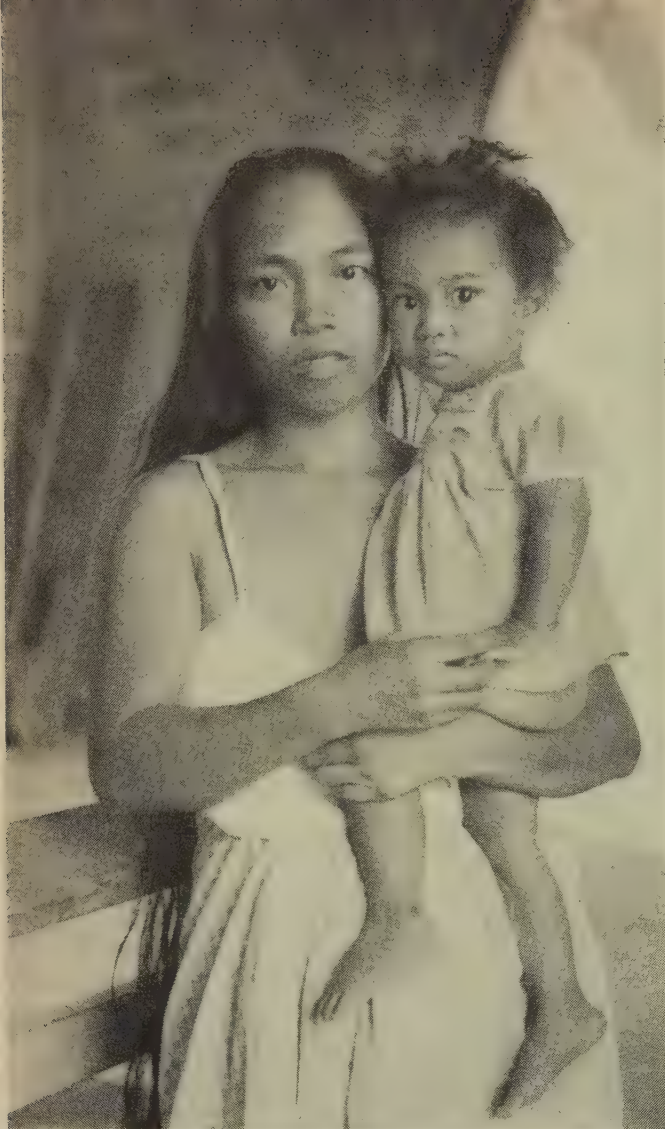
THE FILIPINO, a blend of many ethnic stocks. On the following pages are photographs of the modern Filipino and of some of the native ethnic groups within the Philippines

tongue, one of the eight principal native languages, for which there is a limited written literature.

Minorities

The influx into the Philippines of numerous peoples and cultures from the neighbouring islands and the Asian mainland, and their relative geographic isolation, has left substantial minorities that have not yet been integrated into the society of the republic. Almost one-half of these are known as pagans or have been improperly termed "wild peoples." The largest communities are in the Mountain province and Abra in northern Luzon and in the interior of Mindanao, Palawan and Mindoro. There are about 250,000 Igorots, Ifugaos, Bontocs and other tribal groups that have inhabited the highland areas of northern Luzon since the beginning of historic times and developed a distinctive culture notable for its terraced rice paddies extending up the sides of mountains. These terraces were laboriously built by one generation after another, and some of the walls that hold the soil rise from 10 to 40 ft.

Another class of pagan peoples is known as the "shifting dry



WOMAN AND CHILD of San Luis, a rural village in Pampanga province, central Luzon

agriculture, hunting and fishing groups" of eastern Mindanao, Mindoro and Palawan. Living in remote forests, they clear and burn the trees and the brush and plant crops in between the stumps. The soil becomes depleted after a few years, since they know little modern agriculture, and the village moves to a new site. A community usually makes three or four such moves in a generation. In Mindanao the most numerous are the Manobos, who number perhaps 75,000 in the east central region, formerly distinguished as head-hunters but now relatively peaceful. Other small pagan communities are scattered through Davao, Cotabato and the Zamboanga peninsula. In northern Luzon there are also the Apayaos and Eastern Kalingas, and in Nueva Vizcaya the Ilongots who belong to the shifting dry agriculture groups. They are distinguished for their artistry in ornament and picturesque clothing.

Deep in the forests of Luzon, Negros and Panay live remnants of a third group of timid, wandering tribal people who subsist chiefly on wild fruits that grow in the jungles, such as bananas, and the occasional fish, fowl and small wild animals that they are able to trap or to bring down with their primitive weapons. Most prominent among these shy people who shun civilization are the Negritos, who live today much as their ancestors did when they first reached the Philippines.

Sea Gypsies, otherwise known as the Badjaos, form a unique minority in the Sulu archipelago. They number several thousand and spend their entire lives on their houseboats, each of which holds two families. They live by fishing, by searching for turtle

eggs and by trading with land people for their other needs, sometimes moving their entire boat villages overnight when danger threatens or fishing lures them elsewhere. Altogether, these pagan peoples in the Philippines number more than 800,000. They are separate from Philippine society, do not benefit significantly from government services, nor do they share to any important extent in the decision-making processes of the republic.

An even larger minority comprises the Mohammedan Moros, who dominate the areas of southwestern Mindanao and the Sulu archipelago. The several ethnic groups among them include the Tao Suug people, or Land Moros, of Sulu and the Sea Moros, or Samals, whose craft ply the swift currents among the coral reefs and coconut palm-shaded isles. On the Lanao plateau live the Maranaos, and to the south in the huge province of Cotabato are the Magindanaos. For these Moslems, religion is the centre of their lives. It moulds their social customs, sustains the class system and conditions relations with the rest of the Filipinos. Moro communities are still run by hierarchies of *datus* and sultans whose powers are reinforced by tradition, extensive "clan" relationships and the religious courts. The ordinary Moro shuns the Philippine civil courts established in the capitals of these provinces and some of the larger towns. A Moro feels his land was given him by God and, as a consequence, many have refused to register their property with the Philippine government and secure titles to it. They become easy victims of outsiders and some unscrupulous *datus* who claim their land and are awarded legal title. This struggle over land, particularly when Christian settlers open new areas that the Moros claim by hereditary right, often leads to bitter and bloody feuds. The difficulty arises in part from the government's failure to recognize the Moro type of communal land ownership.

Moros have rarely had much modern education, since their parents feared that this might lead to Christianization. As a consequence, there are few doctors, nurses and teachers to help elevate the Moro ways of life. Sanitation and health are primitive and infant mortality is high. Ancient feudal customs still are in force, including slavery. On the Lanao plateau, where some families own up to 50 "slaves" each, these usually were purchased as small children or were captured from neighbouring Christian communities during World War II.

The young Moro today is torn between allegiance to values of the past and the present. Among the Maranaos, for example, he seeks to become an expert chess player, learns to sing the ancient *darangan*, or warrior ballads, and often carries a .45-calibre pistol instead of a kris. While he learns to recite the Koran in Arabic, he may understand little of its meaning. And none of these skills equip him to compete in the modern economic community whose products he increasingly craves. Only in Cotabato do the Moros, to any important extent, intermarry with the Christians. In the Lanao area and the Sulu archipelago, the Moros continue to hold themselves apart. However, they are becoming politically conscious. A number of Moro leaders now sit in the Congress in Manila where the politicians are beginning to recognize Filipino Moslems as a potent minority determined to protect its particular interests.

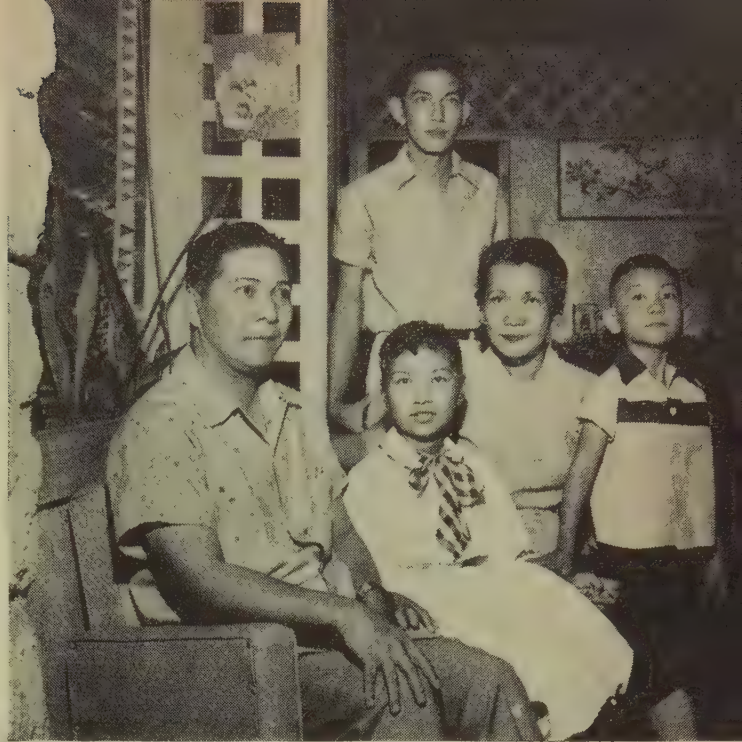
Filipino Christians

About 90% of all Filipinos are Christian, and these are the chief concern of this article; it is they who shape the young republic and give it its special character. Like their pagan and Moslem neighbours, these Christian Filipinos have never known the necessity for planning ahead and saving to survive through the winter. A "discipline of nature" more moderate than that felt by peoples in temperate zones has given an optimistic and less methodical cast to the national outlook. Equally important, Filipinos never have experienced the grinding competition for

THE PEOPLE

About 55 ethnographic groups inhabit the Philippines. Approximately 88% of the population is composed of eight large ethno-linguistic groups: Tagalog, Iloco, Bikol, Pampangan, Pangasinan, Cebuano, Hiligaynon and Waray-Waray. Members of these groups form the typical "Filipino." Among the pagan and primitive groups are descendants of racial migrations of 25,000-30,000 years ago; their way of life is not much changed from that of their ancestors.

Right: A Filipino businessman and his family of Manila

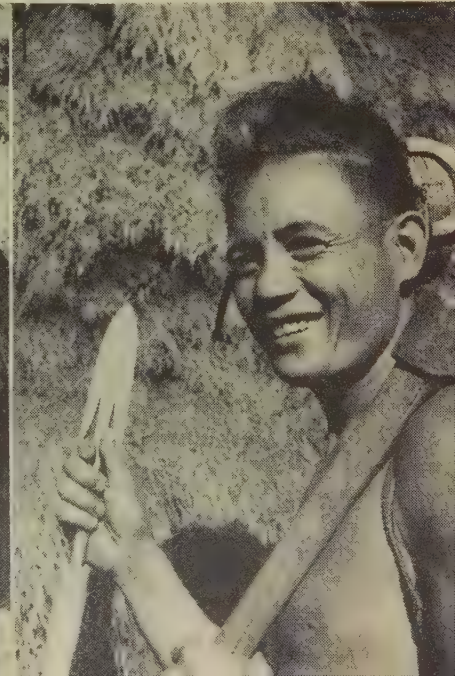
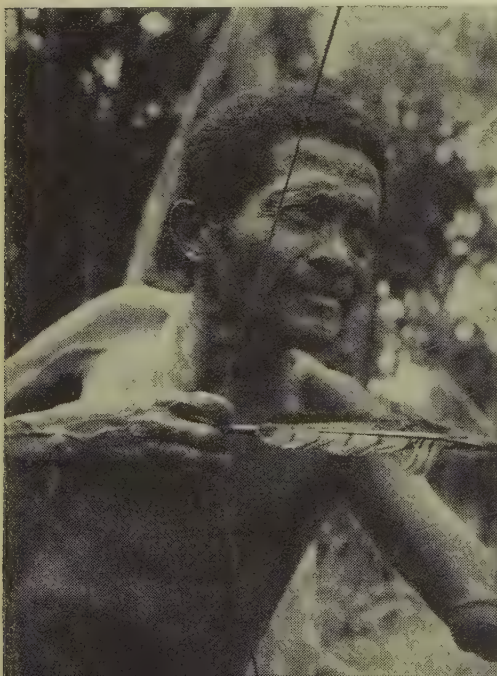


Below: A Moro sultan and his court. Moros are Moslems of several ethnic groups, constituting about 4% of the Philippine population



Above: Farm girl of Luzon

Below: Three of the primitive groups. Left: An Aeta bowman of central Luzon; the Aetas are a pygmy Negrito race. Centre: Kalinga tribesmen, until recently a head-hunting people. Right: Bontoc warrior of the Luzon mountains



survival as it is known in overpopulated countries such as Japan, China or India, where the spectre of famine periodically has emphasized the price of failure or misfortune. Although the Filipinos have a rare talent for learning rapidly, the multiplicity of languages has combined with this influence of geography to discourage verbal exactness and foster in them a casual attitude toward life in general.

Filipinos as a result are lighthearted and carefree to an extent seldom found in other people. Their hospitality is almost boundless. Basic social obligations dictate that a Filipino who is employed frequently supports his less fortunate or less energetic relatives for years without complaint. Dignity and self-respect are found among even the simplest folk, and they are ready to do favours for those with whom they come in contact. They are attached to their children and to the home, where the wife is a dominating and conservative influence; the ordinary Filipino husband usually gives his wife all the money he earns, for her to manage, and receives an allowance for his personal use which he may bet on cockfighting, spend on *tuba*, the fermented juice of the coconut palm, or lend to his friends.

Heritage From Spain

These Christian Filipinos are heirs to the "most effective large scale European missionary enterprise in the Orient." It was this work, continued through more than three centuries of Spanish rule followed by a half-century under the United States flag, that so fundamentally sets the Philippines apart from the rest of Asia. Christianity and other values and Western institutions brought from Europe and the United States have been superimposed upon the native customs and beliefs and have caused the nation now emerging to become an amalgam of East and West.

When the Spanish colonizers under Miguel López de Legaspi began occupying the Philippines some years after Ferdinand Magellan's discovery of the Islands in March 1521, they hoped

SAN AGUSTIN CHURCH, built by the Spanish in the 16th century, the only church inside the old walled city of Intramuros not destroyed during World War II



to find wealth in gold and silver as the *conquistadores* had done in Mexico and Peru. Disappointed in this quest, the Spanish considered abandoning the Islands, fearing they would become an administrative and defensive burden. Instead, the Spanish court, with some persuasion from the religious orders, determined to keep the Philippines with the avowed purpose of Christianizing the inhabitants. This mission led to building a distinctive kind of colonial rule in which maintenance of law and order was not so much a means to economic exploitation as to conversion of the populace. The Spanish in Manila, however, did not forgo the profits of the "galleon trade" that thrived upon purchasing porcelains, silks and spices from Chinese merchants and transshipping them in the vessels that annually sailed to the west coast of Mexico, docking at the port of Acapulco.

As Spanish administration was established throughout most lowland populated areas during the 16th century, it was accompanied by thorough Christianization. In these islands there were no deeply entrenched religions comparable in sophistication with the Buddhism of China and Japan, with its corps of devout monks, to oppose the Christian missionaries. Mohammedanism, which had crept into the Philippines a century earlier, survived only in Mindanao and Sulu where the sultans and *datus* fought off the Spanish forces. And the Spanish priest in the Philippines, with his quasi-official status as the local arm of government, had many arguments to buttress his work as missionary. With conversion and baptism the Filipinos were given Christian first names and were organized into parishes; surnames only became common in the Islands in the mid-19th century, when the Spanish authorities distributed copies of the Madrid tax lists from which Filipinos, as a rule, were assigned their family names.

Most Filipinos accepted then and do today the forms of Christianity, but many of them also have retained some of their traditional beliefs in the world of numerous spirits. These include an almost infinite number of beings who live in trees, ant hills, lakes, on the land and in the air, who may be propitiated with offerings of food to ensure a plentiful harvest or a good catch of fish. Recitation of protective phrases and avoidance of places where harmful spirits are thought to reside is common, and a number of Filipinos carry *anting anting*, or charms, in which they place great trust.

Similarly, ancient practices continue alongside those introduced with Christianity. In Pangasinan province of central Luzon there are communities where a church wedding is not considered a real marriage. The bridegroom must afterward go through the traditional ritual of breaking into his father-in-law's house and with the aid of comrades forcibly carrying off his bride. Customary law likewise continues to be respected in most rural areas. While the widow is legally assured of inheritance as provided originally in Spanish law, there are sections of Ilocos where the elder son receives all property and is responsible for supporting the family, and neighbouring regions where the youngest son acquires all the wealth. A barrio resident who seeks the advantages of statutory law becomes an outcast in many communities.

Along with Christianity the priests brought Westernization. Symbolic of this is the plaza which today is the centre of life in the more than 1,200 *poblaciones* that are the seats of government for the municipalities, or Philippine equivalent of counties in the United States. A site was chosen along the projected route of the King's highway. Along one side of the square was constructed the church, usually patterned on mediaeval European architecture with massive stone buttresses to withstand the frequent earthquakes. Across the plaza government offices were erected which today are headquarters for the municipal mayor and his councillors. Prominent citizens were encouraged to build their homes around this setting, which became the scene of the annual fiesta celebrated in honour of the saint to whose patronage



TERRACED RICE FIELDS of Luzon. Rice is the principal staple food and major farm crop of the Philippines

the community had committed itself. Among the wealthy, dress and eating habits were equally Europeanized. Ordinary Filipinos continue to eat with their fingers, and one requirement of a successful politician today is that he must be known as a man who does not need a knife and fork. The Spanish priests were conscientious in erasing all vestiges of pre-Spanish literature, as part of what they considered their Christian duty. Since the church had control over education the Spanish language became a common tool for communication among the few who were schooled. European values of that time found a place in the Philippines, including the Spanish regard for the *ilustrado* class, or gentlemen of letters and leisure. The energetic work of the priests for the first time gave the Filipinos a sense of a larger unity that reached beyond clan and local chieftain to include other men of like habits and tastes—particularly among prominent land-owning gentry—in neighbouring provinces or islands.

This comparatively creative role of the Roman Catholic Church in the Philippines was reversed after the British occupation of the Islands between 1762 and 1764, and from the experiences of the subsequent period stems the anticlericalism, largely imported from Europe, that is a vital factor in modern Filipino life. As the Spanish civilian and military authorities sought to end the participation by the clergy in administration, the friar orders, including the Recollects, Dominicans and Franciscans, turned increasingly to economic pursuits to support their religious efforts. On their large landed estates they pioneered in introducing many of the crops that now are important. Corn, potatoes and cassava were brought from Central America, the coconut was introduced for commercial cultivation, and the sugar industry was launched primarily through the efforts of the priests. But as the religious orders became wealthy the priests lost direct touch with the people, who often became merely tenants and workers. The Philippines were remote from Spain, particularly before 1819 when they were administered from Mexico, and they served as a convenient place to send persons not wanted

closer to home. In time, some of the priests became corrupted, partly because the church in the Philippines was largely unaffected by the intellectual movements in Spain and other areas of western Europe. However, the religious and civilizing influence of the church ensured the unique status of the Philippines in the Far East.

While the Roman Catholic Church became an increasingly conservative influence in the Islands, Filipinos began to sense the 19th-century European liberalism. Opening of the port of Manila to world trade in 1837 brought prosperity based on production of hemp, sugar and, for a time, coffee. This new wealth enabled young Filipinos to study in Europe, and they were soon caught up in the heady intellectual atmosphere of the day. From these European contacts emerged the Masonic movement in the Philippines, encouraged initially by Spanish intellectuals who saw it as an instrument for curtailing and modifying church influence. For Filipinos it became a popular and influential fellowship. Almost inevitably Filipinos demanded reforms that the Spanish administration refused. A succession of revolts resulted. Following the execution in 1872 of three Filipino priests who had demanded equal opportunities with Europeans, nationalism also began to stir within the ranks of the Filipino clergy. In Dec. 1896 when the Spanish executed the gifted doctor, writer and sculptor José Rizal y Mercado for alleged complicity in the uprising the previous August, they created a martyr who remains today the pre-eminent Filipino national hero. But Rizal's great novels of protest were written in Spanish, and like most of his revolutionary colleagues he was more European than Asian in his thinking.

The United States Influence

Filipinos are even more firmly linked to much that is American by the adventure in sharing democratic ways which began when



HOME OF JOSÉ RIZAL (1861–96), national hero of the Philippines. The house was rebuilt in 1951 and opened to the public as a shrine

Commodore George Dewey's ships sank the Spanish squadron in Manila bay on the morning of May 1, 1898. During the early years after the United States replaced Spain as the colonial power in the Islands and firmly put down the Filipino revolutionary forces, there was much suspicion, not only among the Spanish-educated élite, of the new regime that professed such high ideals. Today there are very few Filipinos who do not concede that their republic has far greater prospects of meeting the aspirations of its citizens than it would have possessed if launched on its own at the beginning of the century. And there are some who nostalgically wish that they were back under the protection of the Stars and Stripes. Their regard reflects the achievements of the United States administration, which encouraged the essential framework on which this new nation is erected. Filipinos generally have been charitable about the handicaps left them by that administration.

Few papers of state compare in breadth of concept with Pres. William McKinley's instructions to the second Philippine commission that established civil government in the Islands on July 4, 1901. One paragraph gives the tone of this assignment:

In all forms of government and administrative provisions which they are authorized to prescribe, the Commission should bear in mind that the government which they are establishing is designed not for our satisfaction or for the expression of our theoretical views, but for the happiness, peace and prosperity of the people of the Philippine Islands, and the measures adopted should be made to conform to their customs, their habits, and even their prejudices, to the fullest extent consistent with the accomplishment of the indispensable requisites of just and effective government. At the same time the Commission should bear in mind, and the people of the Islands should be made plainly to understand, that there are certain great principles of government which have been made the basis of our governmental system, which we deem essential to the rule of law and the maintenance of individual freedom, and of which they have, unfortunately, been denied the experience possessed by us; that there are also certain practical rules of government which we have found to be essential to the preservation of these great principles of liberty and law, and that these principles and these rules of government must be established and maintained in their islands for the sake of their liberty and happiness, however much they may conflict with the customs or laws of procedure with which they are familiar. It is evident that the most enlightened thought of the Philippine Islands fully appreciates the importance of these principles and rules, and they will inevitably within a short time command universal assent. . . .

The Americans who accepted this challenge came fresh from the labours of opening a continent. They possessed an almost unbounded faith in the worth of the solutions the United States had employed domestically. While the folks at home debated and fought political campaigns about whether a union of states based upon representative authority had any right to "get involved in the business of imperialism," the Americans in the Philippine Islands soon built an administration that was a model for its time.

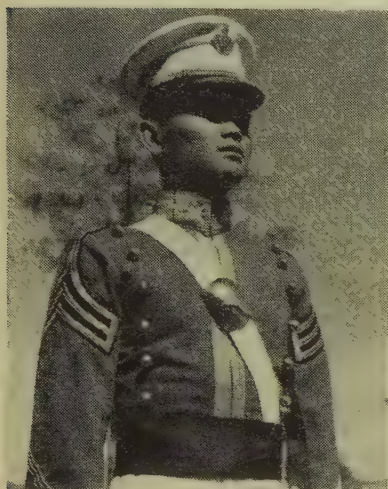
Once order was re-established, public health measures soon followed, giving the cities clean drinking water, curtailing the epidemics of cholera that periodically had struck the populace and training officials in sanitary methods. Roads were pushed into the hinterland, and the taxes needed to pay for them and other public improvements were scrupulously collected. The legal system was remade, and Spanish procedural law was supplanted with provisions that better safeguarded the rights of the individual in keeping with the Anglo-Saxon tradition. The Roman Catholic Church was shorn of its official temporal functions, freedom of religious worship was guaranteed and the Islands were opened to missionaries of all faiths. The U.S. congress voted a special bond issue to purchase and resell to Filipinos most large landed estates of the friar orders.

A public school system based on the English language was built which proved the most pervasive of all American innovations. The first instructors were soldiers, who were joined later by nearly 1,000 teachers recruited in the United States. As Filipino teachers were trained the schools multiplied. Students enrolled in public elementary and high schools increased from about 150,000 in 1900 to more than 1,000,000 in 1921, over 2,000,000 in 1940 and more than 5,000,000 in 1956. Normal schools, trade schools and a national University of the Philippines were established. The product of this schooling was a new type of Filipino steeped in the democratic tradition and persuaded that a man of humble origins could rise by his own efforts. He had read as much about George Washington and Thomas Jefferson as about his own national heroes, and there had been opened before him the accumulated learning of the English-speaking world along with the new emphasis on liberal thinking and science.

Filipinos participated from the beginning in the process of civil government; three served on the commission headed by Gov. William Howard Taft that acted as an executive and deliberative body, and a Filipino was named chief justice of the supreme court on which sat at first a majority of Americans. In 1902 by act of the U.S. congress elective government was instituted in the municipalities. The severely restricted franchise of the Spanish period, when priests regularly counted the votes, was thereafter steadily extended. The creation in 1907 of a Philippine assembly as a lower house to which representatives were elected from most of the archipelago opened opportunities for new careers as politicians. Prestige in the community which formerly belonged almost exclusively to the landowning gentry, often known as the *hacenderos* or *caciques*—local bosses—a few literati and the clergy now was extended to a new kind of person, the "talker," who was knowledgeable about the world represented by the United States. From among this group rose leaders such as Sergio Osmeña and Manuel Quezon to champion the political struggle for independence.

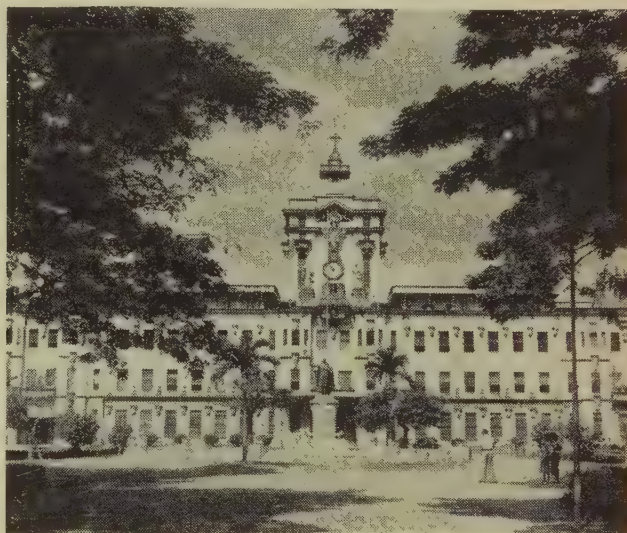
The Democratic party in the United States in its search for campaign issues and in response to the promptings of many liberals had long condemned Republican management of the Philippines. After Woodrow Wilson became president in 1913 the administration in the Islands was radically revamped. Initially, there seems to have been a Democratic plan to give the Philippines independence within a few years, but this objective was modified after the outbreak of World War 1 and the discovery by Democrats appointed to Manila that their Republican predecessors had generally appraised the problems accurately and done a creditable job. However, "Filipinization" of the administration in the Islands was pushed vigorously and many able U.S. civil servants were replaced by Filipinos; in seven years the number of Americans in the insular government was reduced from 2,600 to 582. With enactment of the Jones law of 1916 the Philippines acquired an elective senate and the two houses of the legislature secured substantial control over appropriations. These reforms

Right: Buildings of the University of the Philippines, Quezon City, operated by the government



Above: Cadet of the Philippine Military academy, Baguio

Right: Santo Tomás university, Manila, founded by the Dominican order in 1619

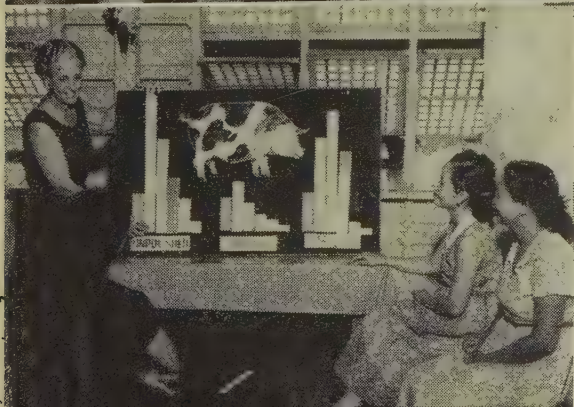


EDUCATION

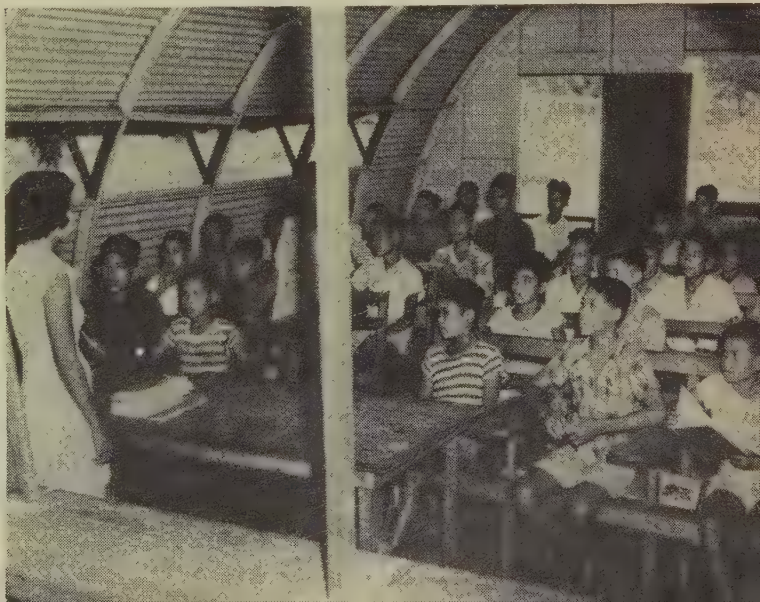
Left: Students of a vocational school at work in the carpentry shop



Below, left: Filipina home demonstrators receiving a course in teaching techniques from a specialist of the U.S. International Cooperation administration home economics extension program



Below: High school class meeting in a Quonset hut formerly occupied by U.S. troops.





WINNOWING RICE on a farm south of Manila, an ancient method still followed in the Philippines

inspired in part by progressive-minded Americans, both placated and encouraged Filipino nationalism. But power passed primarily to the privileged groups who had been dominant during the Spanish period—not many sons of ordinary citizens had yet been educated to compete for the more responsible posts. The quality of administration deteriorated as Filipinos took over. When the Republican party returned to power in the United States in 1921 the Wood-Forbes mission was dispatched to investigate conditions, and it recommended a tightening of control and continuation of the existing status in the Islands until Filipinos “had time to absorb and thoroughly master the powers already in their hands.” Twelve years later with the advent of the Democratic administration of Franklin D. Roosevelt, this insistence upon quality in administration was again subordinated to the demands of American liberal anticolonialism prompted by sugar, dairy and other domestic pressure groups anxious to be rid of Philippine competition. The Tydings-McDuffie act of 1934 spelled out the terms of independence: Filipinos were to manage their own domestic affairs for ten years as a commonwealth under the United States flag before achieving a separate sovereignty. The constitutional convention that met in Manila in 1934–35 framed a national government for the Islands patterned upon the division of responsibility among the executive, legislative and judiciary evolved in the United States. With the elections of Sept. 1935, Filipinos became the full masters of their own internal affairs.

While the United States concept of the role of government

proved creative politically for Filipinos, it did not take them far in solving their economic and social problems. The Payne tariff law of 1909, permitting near free trade between the Philippines and the United States, brought a rapid expansion of commerce. Industries that had flourished in the late Spanish period, such as hemp and tobacco, were re-established. Sugar production expanded rapidly after World War I, and by the early 1930s the Philippines supplied 14% of the United States’ consumption. Growth of the United States soap and vegetable oil industries encouraged the Islands to become the world’s greatest single coconut producer. And a largely U.S.-managed mining industry grew up, primarily exploiting the rich gold deposits the Spanish had overlooked. But for the majority of citizens provision of law and order and public facilities did not afford a substantial opportunity in the economy as it had in the United States; the evils of a formerly feudal society where the few owned most of the property were reinforced when the United States recognized the Spanish land grants and established courts that awarded titles to those who were informed and aggressive enough to prove their claims. As the markets filled with manufactured goods the little Filipino lost the outlets for his handicraft industries that had been such an important source of livelihood. While the Americans encouraged valuable research in tropical agriculture and built centres for training Filipinos in these skills, little of this knowledge percolated out to the ordinary *tao*, or farmer. His rice production remained static at one of the lowest yields per hectare in Asia, while the number of mouths to be fed multiplied and the owner of the hacienda, who probably had moved to the city, demanded higher rents. The resulting grievances sometimes erupted violently through the activities of quasi-religious groups. The Sakdal uprising of 1935, although linked to politics, was primarily an abortive and costly move of social protest. Except for a small Socialist movement in central Luzon and Manila, however, these organizations of Filipinos who wanted a better life were not led by men conversant with modern economic theories.

Fruits of Colonial Experience

Filipinos emerged from the centuries of foreign rule with a maturity of attitude toward their recent administrators rare among Asians who knew colonial status. Overcompensation for once injured national pride, bitterness spurred by memories of the white man’s assumed superiority of bygone days and other painful trappings of a late imperialism are rarely encountered in the Philippines. Instead, Filipinos know the Americans and the Spanish so intimately that they are quite capable of discriminating among and sometimes outwitting them while remaining friendly. Partly this results from the thoroughness with which they have accepted the values of the West—a product in some measure of the idealism that motivated many of the early Spanish and Americans who came to the Islands. Also, the “colour line” never was imposed with the rigidity characteristic of the rule of most European powers in Asia, and intermarriage among Filipinos and foreigners was commoner and more acceptable than elsewhere in the Orient. Throughout the period of United States administration no Filipino martyrs were created who suffered persecution, imprisonment and worse in the cause of independence. Rather, soon after the champions of “things Filipino” gained a political following they won significant responsibility in government. And these national leaders discovered that there was far more to be gained by befriending congressmen in Washington, D.C., and spending for the right publicity than by leading movements of protest in the hinterland of Luzon or the Visayas.

Such influences, however, might have remained of secondary importance but for traumatic experiences of World War II which impelled Filipinos to reassess their past and their prospects for independent existence.

World War II

As happened throughout the Far East where the white man's "face" crumbled before the succession of effective Japanese blows at Pearl Harbor, Hong Kong, Singapore and the Netherlands Indies, Filipinos at first found reports of these events incredible; the entrenched colonial powers had seemed so omnipotent. But the dismay felt throughout the Islands was balanced by the stubborn defense on Bataan and Corregidor of United States and Philippine forces, providing a symbol of joint resistance as Filipinos began to feel the harsh boot of the imperial Japanese army. Japanese-style independence, as expressed in the puppet government created in Manila, won the participation of most prominent Filipino leaders who had not left by submarine with commonwealth Pres. Manuel Quezon and Vice-Pres. Sergio Osmeña and their staffs; some of these leaders in Manila wanted to believe the Japanese promises, others were opportunists, and among them were statesmen who saw limited co-operation as a means of moderating the effects of occupation.

Ordinary Filipinos, accustomed to United States regard for rule by law, sanctity of the individual and protection of private property, were at first offended and then made fearful and angry by the Japanese. The occupation soldiers, conditioned through the looting and abuse of civilians by their army in China, now stole chickens, bathed naked in the streets and intimidated, beat and sometimes summarily executed Filipinos suspected of resistance. From such promptings the new Philippine guerrilla movement gathered strength. Particularly in Mindanao and on other southern islands it was encouraged and supplied by United States forces in Australia. While there were guerrilla chieftains who, once they had assembled guns and men, used them to settle old scores, establish independent domains in the hills or engage in a little banditry, the resistance denied the Japanese effective control and exploitation of the Islands away from the main cities. The guerrilla movement was of equal social consequence. The war taught the poor farmer that he was as good as the rich city dweller who came to beg his food. Amidst the turmoil of the times, social status and wealth were set aside as claims to leadership. And there were elevated from among the ranks of the common people a new generation of leaders whose capacities the guer-

rilla movement had tested and proved in action. They and the men who fought with them got a taste for life without the old inhibitions, and many acquired a new faith in the essential worth of democratic values that formerly had been more of a school-book expression.

When the United States forces returned as liberators to the Islands they achieved a symbolic stature that gave a new cast to Philippine-U.S. relations. The G.I.'s who fought their way from Leyte and Samar to Luzon in 1944 and 1945 became heroes to the village folk. While the Japanese soldier had slapped those who failed to show proper respect for the new order, young Filipinos discovered they could drink, frolic and fight with Americans and remain the best of friends. Thousands of Filipinos attached themselves to United States combat units and fought alongside them, often without pay, through the mountains. The English that Filipinos had learned from their American school-teachers now was liberally enriched with G.I. phrases, and new tastes were acquired for chewing gum, American cigarettes and travel by Jeep. And among reflective Filipinos were some who viewed the war as an object lesson and began to question their original demands for being left as a nation entirely on their own.

Independence Amidst Chaos

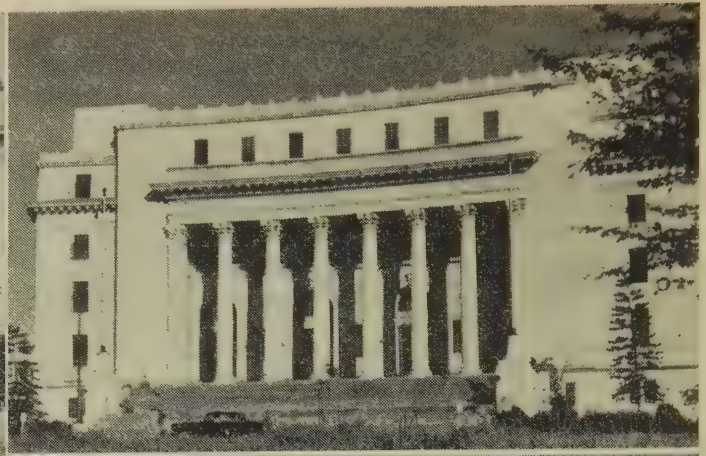
Formal inauguration of the Philippine republic on July 4, 1946, occurred under circumstances that could hardly have been less auspicious for its future success. The decision to sever ties with the United States as envisaged at the time of the establishment of the commonwealth was made despite the views of some sober-minded Filipinos and Americans who held that the date for granting full independence should be reconsidered as a consequence of the ravages of war. Most Filipino leaders, however, were caught in the momentum of their own lifelong championship of independence, and the United States was determined to face the rest of the world with a "clean colonial record" in a postwar era when Asia and Africa were clearly astir. As happened when the commonwealth was created, the Filipino people were afforded only an indirect voice in this decision; the issue was never put squarely to a vote. In April 1946 Filipinos had held the presidential elec-

MANILA, FEB. 28, 1945, a smoking ruin. Of all the capital cities bombed in World War II only Warsaw, Pol., was damaged more than Manila





A CITY REBUILDS: Two government buildings in Manila before and after reconstruction. Above, department of agriculture and natural resources building; below, department of finance



tion that by constitutional provision was scheduled for the previous November but had been postponed because of disorder and continued resistance by scattered Japanese forces. A split in the old alignment of political leadership had led to the defeat of the incumbent Nacionalista administration and election of Manuel Roxas y Acuna as president and Elpidio Quirino as vice-president on the ticket of the new Liberal party. It was they who took oaths of office on that historic July 4 after the reading of Pres. Harry S. Truman's proclamation withdrawing United States sovereignty over the Islands and the lowering of the U.S. flag. The ceremonies were enacted on the grassy Luneta fronting on Manila bay near the spot where José Rizal had been executed. The United States was represented by High Commissioner Paul V. McNutt, General of the Army Douglas MacArthur, Sen. Millard E. Tydings and other prominent civilian and military leaders who joined with delegations from 22 other foreign countries in acclaiming the birth of this new nation. Several hundred thousand Filipinos crowded before the improvised grandstands to watch and listen. And throughout the Islands every community of importance held its own independence celebration complete with parades, bands, salutes and the many speeches Filipinos enjoy.

Dignitaries who assembled in Manila for this occasion looked out over a city that had been more thoroughly wrecked than any other capital in the world except Warsaw. The once-proud public buildings patterned after the architecture of Washington, D.C., had been blasted by dynamite and pocked by shells when liberating U.S. forces dug out the Japanese defenders. The old walled city erected along the Pasig river by the Spanish was levelled except for the skeletons of its cathedrals and the massive stone walls. Once known as the "Pearl of the Orient" because of its tree-lined avenues, happy blending of native and introduced building forms and superior sanitary facilities, downtown Manila now was 80% destroyed.

Throughout the land most smaller cities had suffered similarly, particularly during the last desperate days when the Japanese often deliberately despoiled government offices, schools and

churches. Bridges, ferries and telecommunications had been choice targets for the contending armies. During the years of occupation, looters had dismantled much that was movable from factories and homes and sometimes burned the buildings. Carabaos that pulled farmers' plows had been commandeered by Japanese or guerrillas, or perhaps eaten in a time of want. Commerce was at a standstill, and cloth, salt, rice and other staples of life were in acutely short supply. With war had come disease; islands once virtually rid of malaria had been reinfected and large percentages of the inhabitants laid low at a time when imported curative drugs were unobtainable.

The new nation was critically handicapped at its inception by the division among its people over the issue of collaboration. Most of the older generation of leaders, including President Roxas, had been associated in some manner with the puppet government sponsored by the Japanese, and the covert assistance to the Allied cause pleaded by these men was not easily evaluated. Some families also had made fortunes dealing with the enemy or speculating in scarce commodities. Now public opinion led chiefly by former guerrillas demanded an accounting. The U.S. army had muddled the situation by its careless management of guerrilla recognition and awards of back pay for wartime service. So many persons who had lived carefully in Manila throughout the war or actually collaborated with the Japanese were recognized as guerrillas, with all that this implied in status and benefits, that a number of real fighters from the hills were disgusted and refused to seek recognition for their services. The United States government, which presumably had legal jurisdiction over such problems up until the time of independence, chose not to act and instead announced that this was a problem to be settled by Filipinos. President Osmeña had induced the Philippine Congress to authorize a people's court to try those accused of collaboration. But Solicitor General Lorenzo Tañada and his staff found their prosecution of such cases hampered by innumerable delays. A general amnesty for political and economic collaborators with Japan was announced by President Roxas on Jan. 28, 1948. Although this did not officially extend to those found guilty of

treason, acting as spies or otherwise militarily aiding the Japanese, it marked the end of substantial Philippine government concern with this issue. While time has tempered their feelings and led some Filipinos to be more charitable toward men who worked alongside the Japanese, bitterness over the question of collaboration continues to influence political alignments and events.

Inevitably, the early years of independence were a time of inflation. Filipinos with pockets full of wartime back pay who had craved a fountain pen, a favourite brand of American cigarettes, a can of milk or a shirt now paid fabulous prices for the few goods available. During the first five postwar years United States expenditures in the Philippines exceeded \$2,000,000,000, including approximately \$520,000,000 for war damage payments and reconstruction of public buildings and facilities, nearly \$200,000,000 to Filipino veterans for back pay, and roughly \$250,000,000 to civilian employees of the U.S. army. The inflationary pressure thus generated was relieved almost entirely through consumer spending. War matériel that had cost more than \$1,000,000,000 had been stockpiled in the Philippines for the invasion of Japan. This surplus now was transferred to the new government at a "book value" of \$50,000,000. Spotted through the islands were enormous dumps of vehicles, uniforms, construction equipment, steel mats for landing fields and all the paraphernalia an army needs to live, move and fight. G.I.'s, anxious to get home, had left them sometimes without adequate guards or accurate inventories. The opportunity to profit by theft or buying surplus for a fraction of its value with political protection led to the creation of a class of Americans and Filipinos who made easy money and were not always bound by moral scruples.

Before the war firearms were not commonly available in cities or rural communities, lawlessness was kept to a minimum, and citizens regularly left their homes unguarded with doors and windows open. Now all this had changed. For years it had been patriotic to steal from the Japanese, and many had lived by it. Such habits were not soon forgotten, particularly among those unwilling to adjust to the humdrum of a workaday life or unable to find useful employment. Weapons had been distributed almost indiscriminately to the resistance forces and more were readily available from the cases of "surplus." As postwar theft and banditry multiplied, Filipinos found it necessary to protect their windows with elaborate iron grillwork, raise walls around their homes and lock their gates. Large *hacenderos* built up their own police forces outfitted with automatic weapons to protect property and occasionally enforce the views of the owner. Business-

U.S. ARMY CEMETERY at Fort McKinley, near Rizal

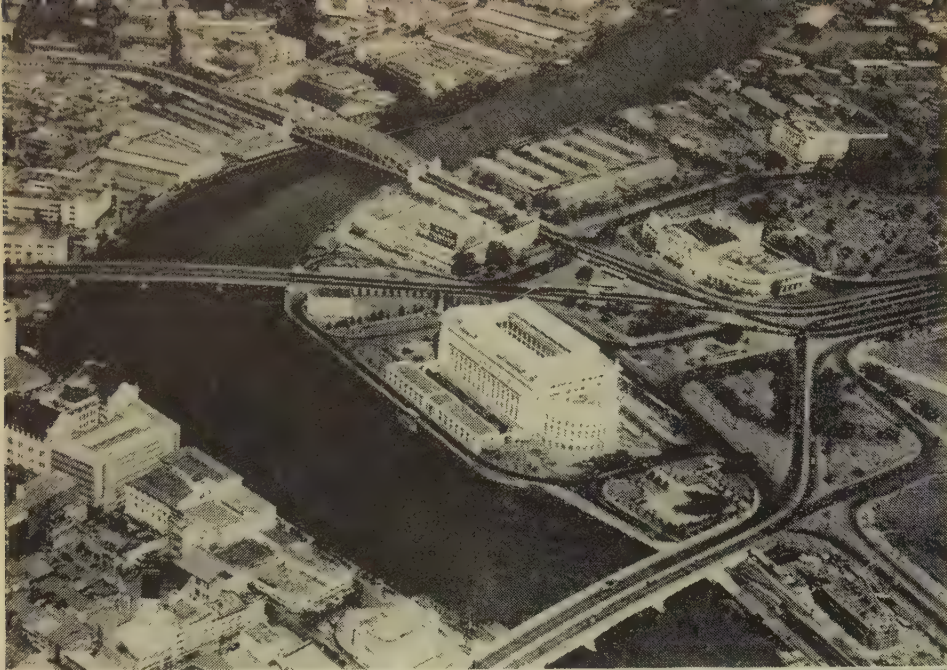


INDEPENDENCE DAY, July 4, 1946. U.S. troops passing the reviewing stand at Manila as the Philippines formally became an independent republic

men and officials began carrying .45-calibre automatics and .38-calibre pistols, and banks, public offices and night clubs posted signs at doors announcing "Please check your firearms here," with a guard to collect and ticket the weapons.

Moral corrosion reached deep into the life of the Philippine republic during its first years. Senators and congressmen were prominent among those who flaunted their corruption, and one of them candidly justified his use of public office for private gain with the announcement, "This is why we are here." Congress awarded its members each a quota for Chinese who could enter the Islands, and some collected fat fees in return for admitting aliens. Amidst the disorganization of government that was a heritage of war when records had been destroyed, new opportunities were created for patronage; and the rigid requirements for civil service acceptance and advancement established during the period of U.S. administration were modified to accommodate those with powerful political friends. As the quality of the government services deteriorated, so did performance. Goods were boldly pilfered from the Manila docks where they were supposedly under the protection of the customs service. Taxes frequently were collected most fully from those who failed to bribe the collector. The essential honesty of the Philippine government personnel was being undermined both by the spectacle of prominent men who helped themselves and their relatives and by the high cost of living, which was more than five times that of prewar. It was a time when materialism gained a new supremacy in the minds of Filipinos, particularly in the larger urban centres.

The most severe symptom of the social ills afflicting the young republic during its early years was the Communist-led Hukbala-hap rebellion. The Huks, as they were popularly known, were officially organized in 1942 as the Anti-Japanese People's Libera-



Above: Downtown Manila and the Pasig river. Building in centre is the post office



Above: Statue of Liberty on a wall of Intramuros, the old walled section of Manila founded by early Spanish conquistadors



Above: Shopping and theatre area in the business district

MANILA

Below: Foreign ships docked at Manila harbour. Philippine exports total more than \$400,000,000 annually



Below: Western-made automobiles and a man carrying baskets in typical Eastern fashion meet in Manila's business district



tion Army, which rallied its strongest support among the tenant farmers of central Luzon. From bases in the almost impenetrable Candaba swamps and the watery marshes skirting Manila bay on the north, these guerrillas fought a running war against the enemy and claimed a commendable record for their resistance. Their politically conscious leadership, including prewar Socialists and Communists, went beyond the scope of most other guerrilla organizations in building local instruments of civil authority. And when an armed Huk chanced upon his prewar landlord, whom he often resented, the result was sometimes a brutal settlement of old scores. This brought the Huks into conflict with the U.S.A.F.F.E. (U.S. army forces, far east) guerrillas, who included some of the educated and patriotic sons of large landowners and Americans who had escaped from the Japanese.

Largely because of friction with the U.S.A.F.F.E. guerrillas and the wartime abuses charged to the Huks, the U.S. army denied them recognition and back pay for their resistance efforts. An important opportunity thus was lost to encourage many ordinary folk in the movement to return to peaceful pursuits. President Roxas and the Liberal party majority refused to seat the rebellious Huk commander Luis Taruc and his colleagues after they were elected to Congress. Some Filipinos felt that the move was aimed to ensure passage of the controversial "parity" amendment to the Philippine constitution granting Americans equal economic opportunities with Filipinos, for 28 years, as called for in legislation enacted by the U.S. congress. Actually, it was an expression of the increasingly fierce social-political struggle. These rebuffs, however, strengthened the influence of the extremist Communist elements in the Huk organization and facilitated their attempts to capitalize upon the postwar frustration of men who had fought but found themselves with little left except their arms.

The mass appeal of the Huk rebellion, however, had deeper roots; this revolt against authority drew its vital strength from the misery and dissatisfaction felt by rural folk in much of Luzon and on some other islands in the archipelago. There abuses were multiplying as a result of an almost feudal landowning system resting upon a near-primitive agriculture. As the population grew, more families competed for the right to work the same fields. The war left many a peasant farmer without even his meagre capital in tools and livestock. Unemployment, particularly among the educated youth, fostered a feeling of despair. A Rice Share Tenancy law had been passed by Congress awarding the tenant farmer 70% of the main crop when he supplied his own seed, tools and work animals, but it was rarely enforced. Instead, large landowners were inclined to collect half the crop, and, if their own private guards were inadequate, occasionally arranged with a local commander of the Philippine constabulary, or national police force, to assist in rent collection. Lacking means to feed and clothe his family, the peasant turned to the usurer, who might be a landowner or a local Chinese merchant, and became mired in debt.

Farmers in an ugly mood were receptive to the persuasions of young Huk organizers, who often were recruited from these same rural communities and indoctrinated by the Communists to promise land, justice and a voice in government. Once Huk power was established in or near a community, those who were reluctant to co-operate with it were compelled to do so and to furnish the rebel authorities with rice, labour and information. Occasionally the villagers were given a share in the funds and supplies the Huks captured in raids on government offices, through kidnapping wealthy Filipinos and holding them for ransom, and by outright banditry.

At its peak the Huk movement had perhaps 30,000 armed men in its regular guerrilla-style military establishment, and auxiliaries available for limited duty may have numbered sev-



FILIPINO TROOPS pursuing rebels through the swamps during the Huk uprising of 1948

eral times as many. Friendly supporters could never be accurately gauged, but they included a significant portion of the poor farmers in Luzon. Most disturbing was the Huk success in winning over Filipino youth, some of whom were sent to the mobile Stalin university established by the movement to school propagandists and indoctrinate Communist cadres. While maintaining their rear bases deep in the Sierra Madre and Zambales mountains, the Huk forces roamed over most of central and southern Luzon. During the first years of independence they developed a strong following in the infant labour movement, especially within the Congress of Labor Organizations. Sympathizers became active in schools. Their agents penetrated many bureaus of government and the military forces, and Huk intelligence at one time was superior to that of the Philippine army and constabulary. Senior Huk leaders adhered to the Communist line, preaching hatred of the United States. They seemed to borrow encouragement and some guides to their military and political strategy from the Chinese Communists, who were then on the threshold of power. Allied with the Huks was the small Communist organization that had grown up among Chinese in the Islands as part of their resistance to the Japanese.

The Republic Totters

The Philippine republic reached its lowest ebb with the presidential election of 1949. Elpidio Quirino, who had succeeded to the presidency upon the death of Manuel Roxas in the spring of 1948, was the candidate of the Liberal party. His running mate, Fernando López, was a prominent member of the politically and financially potent planter group, or "sugar bloc." The opposition Nacionalistas nominated José Laurel, the former supreme court justice who had served as president of the Japanese-sponsored puppet republic. But party affiliation did not determine loyalties in this struggle. Political leaders such as Sen. Tomás Cabili, the burly and independent-minded guerrilla chieftain from Mindanao, forsook the Nacionalistas in protest against their choice of a candidate who had worked with the enemy. As the campaign developed, resentments accumulated during and after the war were unleashed—some Filipinos felt it their patriotic duty to prevent Laurel's election. In one municipality in central Luzon three candidates for mayor were killed while campaigning. Even in areas remote from the scene of the Huk rebellion, violence became politically expedient. In several Visayan provinces landowners in control of local government used their private guards to intimidate the opposition. Election day was one of considerable bloodshed and much abuse of power by the police and military.

Ballot boxes were tampered with and voters denied freedom of choice to an extent that made the election of limited worth as an expression of popular choice. The Manila press also noted that there were a number of communities where "birds, bees, and even trees had voted." The incumbent Liberal party was proclaimed the winner. Followers of Laurel in his home province of Batangas staged a brief revolt that was called off only after delicate negotiation.

In the aftermath of the 1949 elections Filipinos discovered that officials seeking votes in contested communities had freely handed out treasury warrants to pay for schools and bridges. The national exchequer, already impoverished by ineffective tax collection, was facing bankruptcy. Construction on roads and other public works had to be halted as funds to pay for them ran out. Elementary schoolteachers, who in the Philippines are paid by the national government, waited three and four months for their salaries. The government also had difficulty finding funds to pay the army fighting the Huks. In the winter of 1949-50 foreign exchange reserves sank so low that it was necessary to impose controls—dollar expenditures in the Islands by the United States were tapering off, and the prewar export industries depending principally upon sugar, Manila hemp and coconuts had not yet been fully re-established. The taste for consumer spending continued, however, and some of the most notorious scandals of the postwar era came out of the Import Control office established to determine who should be permitted to bring in the goods that earned quick fortunes. While President Quirino launched a "national mobilization program" and made some sound government investments, particularly in electric power development, the Philippine economy was not sufficiently recovered from the war to stand on its own. Under the combined impact of rebellion and social, economic and political malaise the administration in Manila was losing its capacity to govern, and, in turn, Filipinos were losing faith in their competence to manage representative institutions.

U.S. Interest Renewed

Communist conquest of the mainland of China in 1949 and the outbreak of the Korean war in June 1950 galvanized the U.S. government into a belated reassessment of Philippine affairs. The most urgent concern was strategic; with the Chinese mainland under unfriendly management the island nations of the western Pacific acquired a new significance for U.S. military planners. By an agreement signed in 1947 the United States had retained substantial naval, air and other military bases in the

Philippines that now became of critical importance for backstopping the defense of Korea, Japan and Formosa. The Huks already had forced the U.S. 13th air force, based at the largest of these, the 158,000-ac. Clark Air Force Base—Fort Stotsenburg reservation in central Luzon, to bring supplies from Manila in armed convoys. The demonstrated capacity of Mao Tse-tung and his comrades to come down out of the hills, take over a country and build a massive army in short order alerted Washington, D.C., to a sober estimate of the Huk menace. And at this critical juncture other Asians were discovering that the "show window for democracy" the United States took pride in having helped establish in the far east was not working to the satisfaction of its citizens. The United States was confronted now with the results of its failure to ensure that the Philippines acquire an economic and social base adequate to support the political institutions of the young republic.

An emergency loan was arranged in the summer of 1950 to provide pay for the Philippine army if the national treasury defaulted, and a Joint United States Military Assistance Advisory group was established in Manila. With its complement of a few dozen officers, including several with rare talent and insight, J.U.S.M.A.A.G. assisted in an organizational revamp of the armed forces of the Philippines. At new schools Filipinos were trained in maintenance and use of weapons and matériel that could be spared for the Islands after meeting urgent needs of the war in Korea. A group of able Filipino officers were assisted in making staff studies of their military establishment which provided the basis for a far-reaching change in command; selected senior officers were retired and replaced with aggressive younger men, many of whom were veterans of the resistance. One of the new battalion combat teams, numbering about 1,200 men, went as the Philippine contingent to fight alongside other United Nations forces in Korea. Most radical was the change that occurred in the relations of the armed forces with the citizenry. Formerly, soldiers had been more feared than the Huks in some communities. Now the army under the guidance of specially schooled officers began to evolve a "social conscience"; military courtesy was enforced and soldiers were instructed in winning the confidence of rural Filipinos by responding to their needs for protection, payment for rice and chickens commandeered and justice in dealings with landowners and officials. Huks were induced to surrender by offers of land and a new life on the frontier of Mindanao. The remaking of the Philippine defense establishment which led in time to the military defeat of the rebellion was a near-model in Philippine-American co-operation. Given the means and an opportunity the younger Filipino officers, many of whom had risen from humble origins, proved they possessed the capacity to manage their problems.

After Japan's surrender the United States government had lent substantial technical as well as financial assistance toward re-establishing administration in the Philippines. The bureau of public health, weather bureau, bureau of public highways and other specialized instruments of government had been aided by their United States counterparts through training of staff and loan of technicians and in reconstructing their facilities. In its search for a more comprehensive approach to this assistance, the

U.S. PILOTS RACING FOR THEIR PLANES during an alert test at Clark Air Force Base in 1954. The U.S. maintained a strong military establishment in the Philippines from 1950





VETERANS' FARM, an establishment of the Philippines Economic Development corps designed to provide housing for former servicemen and Huks who were either without homes to which to return after the war or who had always before lived in primitive villages and now sought a better way of life. Land was cleared at the edge of the jungle on Mindanao in 1951; several other communities were subsequently completed. Each immigrant family was given a home, farm land and a daily loan until the farms became productive. The settlements included schools, churches, hospitals and libraries

Truman administration now dispatched about two dozen experts, known as the Bell mission, to survey conditions in the Islands. They submitted a perceptive report calling for action on basic problems of land reform, unemployment and lack of opportunity for the young. Late in 1950 the Philippine and United States governments signed the Quirino-Foster agreement pledging support for a joint development program anticipating about \$250,000,000 in U.S. grants and loans over the next five years. The United States, however, imposed conditions for this aid: the Philippine government was pledged to enact tax measures and spur collection adequate to meet operating costs, and pass a minimum wage law to protect the lowest-paid workers who might otherwise bear most of the burden of such taxation. The Philippine congress by resolution was asked to indicate its support for the program. After several months of jockeying by reluctant senators and congressmen, these conditions were met, and in the spring of 1951 the U.S. Economic Cooperation administration to the Philippines began operations.

Filipino Citizens Mobilize

More consequential than these official moves was the awakening determination of ordinary Filipinos to recapture their political heritage. The republic has a free and vigorous press centred in Manila and a number of independent radio stations. While of interest primarily to the more educated urbanites, these two mediums do reach into most settled communities in the Islands and shape public opinion. In this time of national crisis Filipino newspaper and radio men generally proved their courage by

vigorous portrayal of the misdeeds of officialdom and the ills confronting the country. Exposés and headlines announcing "Anomalies Suspected" became commonplace. Few constructive alternatives were offered, but the nation was aroused. Disturbed by the drift within their government and the threat of chaos, Filipinos acted together in search of answers. Prominent among the groups whose meetings became forums for discussion were the civic organizations of Lions, Rotary, Junior Chambers of Commerce and the smaller League of Women Voters. Religious and youth groups such as the Young Men's Christian association and Catholic Action held seminars on national problems and the threat of Communism. Filipinos impatient for solutions joined organizations such as the new Citizens' party led by Senator Tañada, which enlisted some of the more idealistic and prominent younger men on the threshold of politics. Among the effective new tools now forged was the National Movement for Free Elections, which in co-operation with civic and regional organizations launched a campaign to preserve the franchise for Filipinos.

A Leader Emerges

The time was ripe for a leader who could satisfy the yearning of Filipinos for integrity and competence in tackling their problems. The lot fell to Ramón Magsaysay. Elevated through the

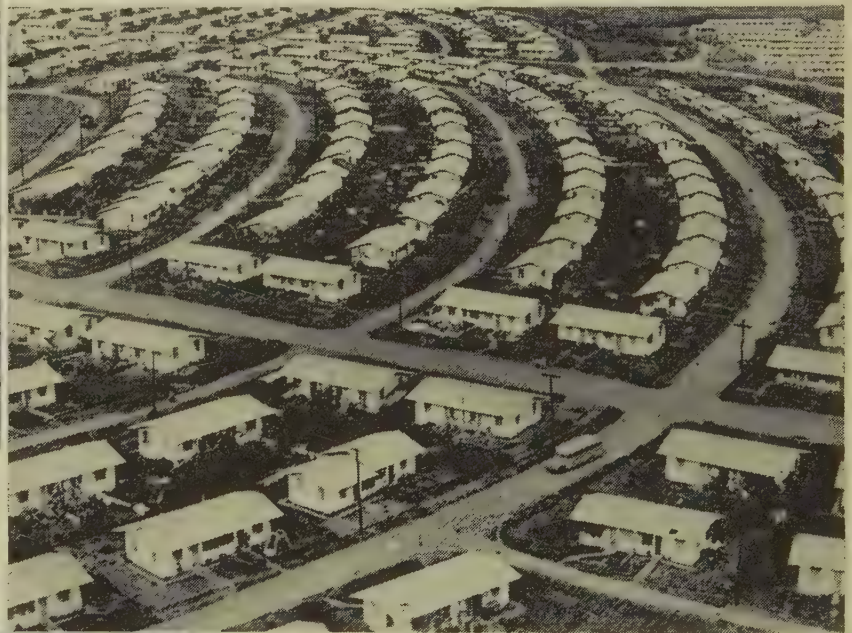


Above: Water control and cleanliness have meant better agricultural production and a reduction in the spread of water-borne diseases to the people of the barrios. This village irrigation canal was a joint project of Philippine and U.S. agencies

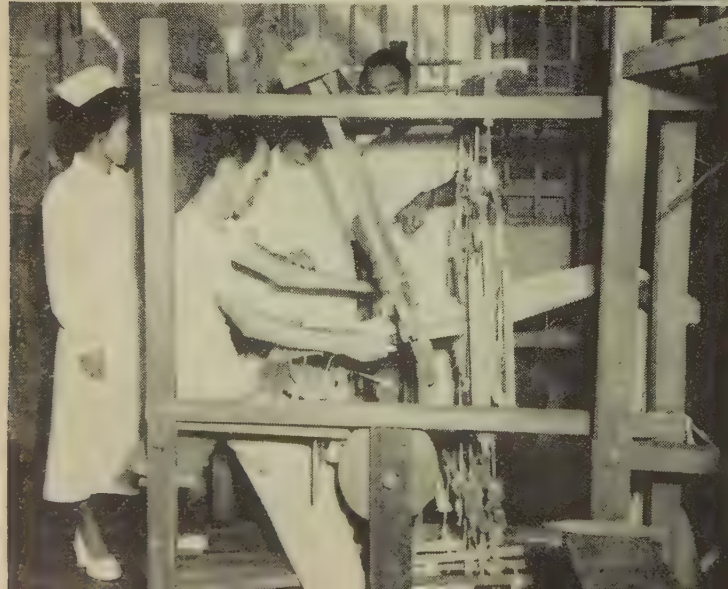
UNITED STATES AND UNITED NATIONS PROJECTS

Left: Postwar development of village industries was encouraged to meet the competition of imported goods. The woman potter shown here was able to improve her work after training with a UN ceramics expert

Below: Housing development, Quezon City, financed with U.S. dollars and constructed by Philippine agencies and the U.S. International Cooperation administration (ICA)



Below: Medical programs. Left: occupational therapy for the disabled at the National Orthopedic hospital, Manila. ICA donated equipment and supplies. Right: tuberculosis vaccination program conducted by the UN World Health organization



hard school of guerrilla warfare from a trucking company employee to military governor of his home province of Zambales, he was elected to Congress after the war. On the armed forces committee of the house of representatives Magsaysay had been at grips with the most acute of all Philippine needs—that of re-establishing law and order throughout the land. In Sept. 1950 he was named secretary of defense in the cabinet of President Quirino. This tall, well-muscled man of forthright manner and simple tastes soon captured the popular imagination. Magsaysay was then in his early 40s and possessed of extraordinary energy. In rebuilding the armed forces of the Philippines and carrying the war to the Huks in the hills he moved about the Islands by plane, jeep and on foot, making surprise visits to units in action, removing incompetent commanders and promoting the deserving on the spot. Because he felt himself a man of the people, and the young army staff officers had begun to reorient the troops to this attitude, Magsaysay was able to win the confidence of ordinary Filipinos. Aggrieved tenants welcomed his assignment of army lawyers to fight their cases in court. And from citizens who once again had come to trust the armed forces of their government, the defense department secured vital intelligence that permitted them to begin outwitting the Huks. A guerrilla sent by the Communists to liquidate Magsaysay was so won by his sincerity that the agent instead offered information which led to the arrest of most Philippine Politburo members who had been hiding in Manila. In the Nov. 1951 elections for eight members of the 24-man senate, governors and municipal officials, the army and constabulary that had learned new loyalty to the constitution under Magsaysay's direction were used to safeguard the polls. The result was an orderly and free election in all but a few provinces that gave the opposition Nacionalistas substantial representation in the government.

Almost inevitably Filipinos in search of a new promise in politics turned to Magsaysay. One evening in Nov. 1952 he was invited to a secret meeting at the home of Senator Tañada with Sen. Eulogio Rodriguez, veteran chairman of the Nacionalista party, and Sen. José Laurel and Sen. Claro Recto. An agreement signed then and carefully locked away pledged this triumvirate of Nacionalista leaders to support Magsaysay's nomination as presidential candidate of their party and concurrently of the smaller Citizens' party. In return he promised to "consult" them on important appointments. Philippine politics are highly personalized, and loyalty to a party or a platform seldom deters advantageous realignment. In this instance the Nacionalista chiefs picked as their candidate a political newcomer and a Liberal for one reason—to win. They reasoned that Magsaysay combined the attractions of a popular hero and support within the armed forces which would prevent possible use of these forces against them as had happened in 1949. Early in 1953 Magsaysay resigned as defense secretary and soon thereafter was nominated by a neatly managed Nacionalista convention. Within the Liberal party also there was dissatisfaction with Quirino's leadership. When the president insisted upon seeking re-election despite his ill health and the constitutional provision limiting him to another two years in office, a large faction, including the sugar bloc, walked out of the Liberal convention. After an abortive attempt to back Carlos P. Romulo for the presidency, this new Democratic party under the guidance of staunch independents such as Sen. Tomás Cabili threw its support behind Magsaysay in return for acceptance of its incumbent congressional and local candidates by the Nacionalistas.

Elections of 1953

The 1953 elections became the critical test of representative processes of government in the Philippines. Could the republic manage an orderly transfer of power from one party to another?

Except for the city of Manila, where the Nacionalistas in 1951 had elected as mayor the volcanic-tempered and courageous Arsenio Lacson, a one-time newspaper columnist, boxer and congressman, the Liberals enjoyed the immense advantages of controlling administration throughout the Islands. The Philippine president has inherited many of the powers exercised by the Spanish and United States governors general. He is authorized to suspend elected provincial governors and mayors as well as appointive officials. Tax collection is equally centralized, and local communities are largely dependent upon the national government for funds to build water systems or roads. The nearly 90,000 public schoolteachers and educational administrators paid by the national government composed the single largest and most extensive official entity in the Philippines. Schoolteachers had been chosen as chairmen and poll clerks of the electoral boards in each precinct. Determined to win their co-operation, the Liberals had given the teachers a pay increase a few months before the election. School superintendents were shifted from one province to another in an effort to place staunch Liberals in key areas. Among the incumbent Liberal officials were a number who feared that a change in administration might result in their trial and imprisonment for flagrant abuse of public funds and authority. They sought to prevent a change in political control by any means at their disposal.

An Old Order Upset

William Howard Taft, after serving as the first U.S. governor of the Philippines, reported:

... Much remains to be done ... in teaching the people of the Philippine Islands not only that they have rights under the law, but also that they cannot hope to enjoy such rights unless they acquire courage and independence sufficient to assert them against attempts by their fellow Filipinos to perpetuate the system of "caciqueism" or bossism, by which they have heretofore been completely governed. ... Comparatively few of the Filipinos who have been in politics ... have felt an interest in teaching the common people their individual rights in respect to personal liberty and property ... this work of instruction will require many years before the country is rid of the feudal relation of dependence which so many feel toward their wealthy or educated leaders. ...

The *caciques* derived power originally from ownership of land, which gave them control of the lives of the people who worked for them under the Spanish system of rule. With the pattern of their patriarchal authority well established, they were able to hold

RAMÓN MAGSAYSAY campaigning for election in 1953. Magsaysay's speaking tour of rural areas and remote villages was an important factor in his landslide victory over Elpidio Quirino for the presidency





Above: Fishermen of Zamboanga preparing to spread their nets

Below, left: Typical houses, built of nipa palm fronds, of a Philippine village
Bottom, left: Women of a village near Batangas washing their clothes in a stream



Below, right: Women farm helpers harvesting the rice crop
Bottom, right: Market day. The large circular baskets contain fresh coffee beans



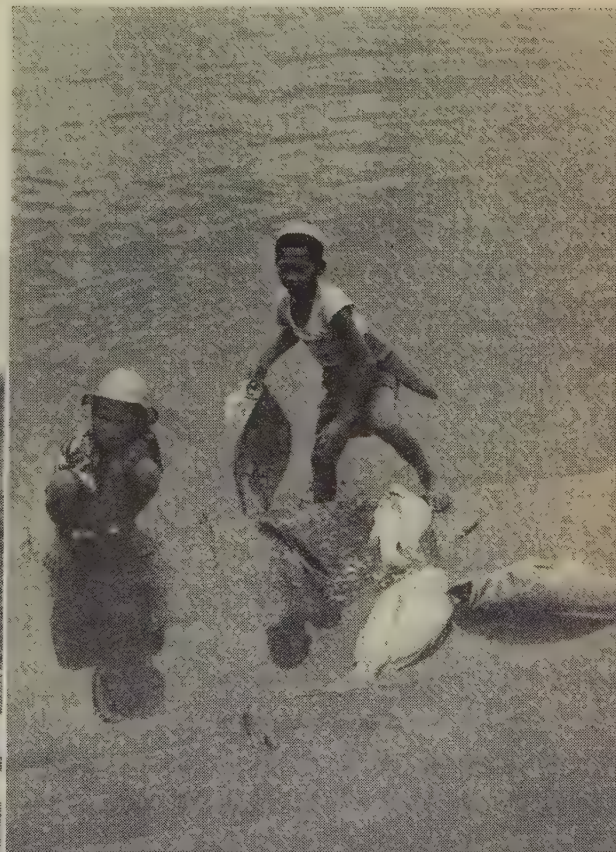


Above: General view of a small settlement along the Agno river in the mountains of Luzon. Virtually all the cultivated land is carefully tended, the average size of a Philippine farm being only slightly more than ten acres

RURAL LIFE IN THE PHILIPPINES

Right: Village boys preparing to leave the water front after cleaning their catch with a machete

Below: Ifugao lumbermen of Luzon



control under a new guise from the first elections. A perceptive Filipino politician put it this way: "Under the Spanish, the country was run by the friars and the *hacenderos*. Under the Americans, when all kinds of people went to school and leaders had to be elected, 'talkers' were able to win. So the *caciques* bought them." This was the political structure on which rested the power of the provincial bosses who had dominated both the major parties and traditionally bought or traded votes in return for favours or cash.

Magsaysay and his followers now undertook to break this pernicious political system, which in 1953 worked primarily to the advantage of the Liberals, by organizing the first mass political campaign in Philippine history. Even before Magsaysay was nominated a corps of idealistic younger Filipinos had established the Magsaysay for President Movement, which held Island-wide rallies that primed the delegates before they departed for Manila. Organizational talents and skills acquired in guerrilla days now were applied to politics. A special M.P.M. unit infiltrated the Liberal party and key government bureaus, assembling intelligence which was used by other Magsaysay workers to confuse the opposition. While the coalition of Nacionalista, Citizens' and Democratic parties attended to routine politicking, the M.P.M. built an organization which enrolled roughly 1,000,000 members. Filipinas who traditionally had shunned open participation in politics were organized into the Women's Magsaysay for President Movement. They did special jobs such as house-to-house canvassing to remove phony names from the registration lists through court petitions, and were largely immune to the threats that kept men at home. Magsaysay set the style for the campaign by going into the remotest barrios and talking to the ordinary folk about their needs for wells, schools and roads and most of all for a government that would be responsive to their desire for social justice and peace. The ferment aroused by this new kind of campaigning drove other candidates into the villages. One congressman seeking re-election in central Luzon formerly had been content to hold meetings in towns and

give pig roasts for his followers. This time he and his wife walked in their bare feet through rice paddies to visit more than half the villages in their district.

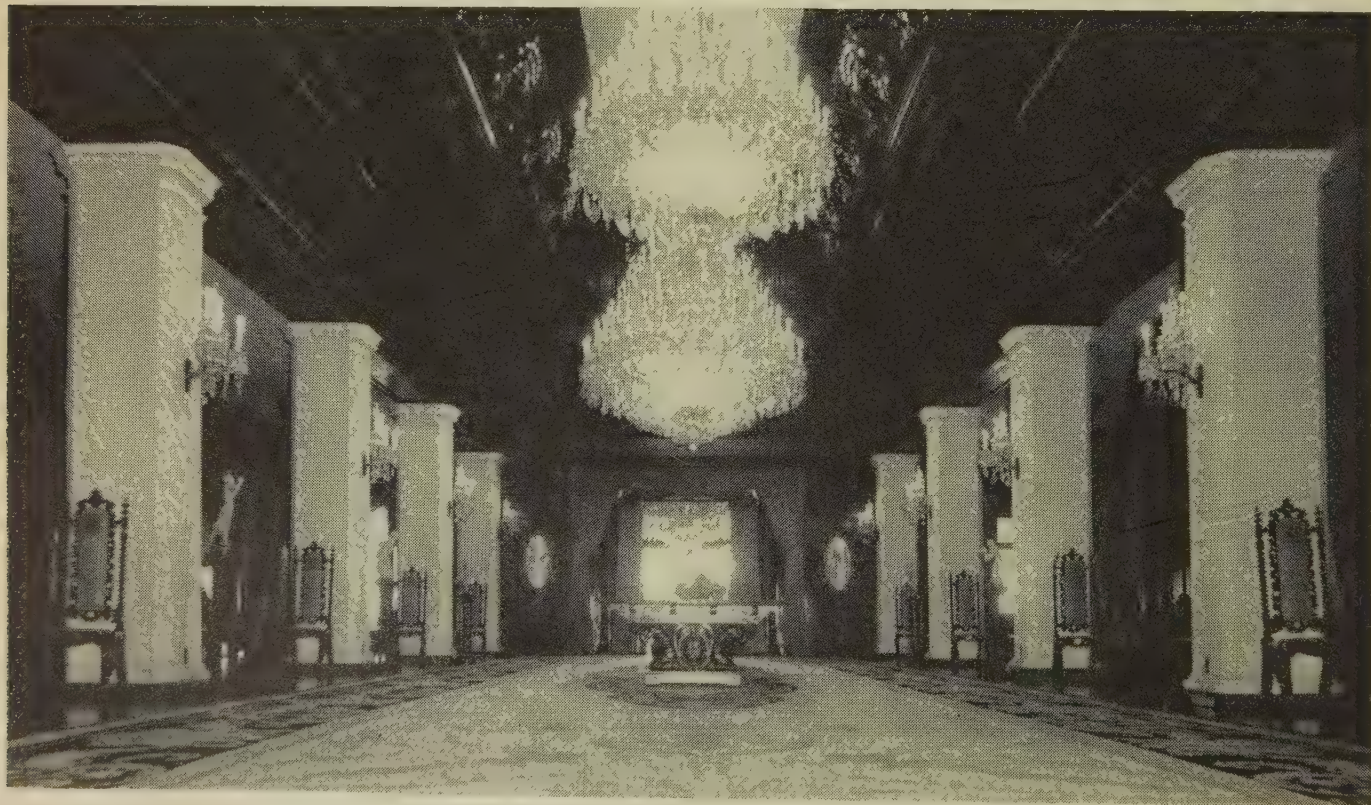
Election day in Nov. 1953 climaxed a national effort that stirred Filipinos as nothing else had in the postwar era and did great credit to their mastery of the democratic method. Due in large measure to the mobilization of civic groups to watch the polls, more than 5,000,000 Filipinos voted in a fair and peaceful election. Magsaysay and most of the candidates on his ticket won overwhelmingly—they received roughly two votes for every one cast for the Liberals. Individual Filipinos who took immense pride in this national performance usually were unaware of the major social upheaval of which it was an integral part. For the first time the landed gentry and provincial bosses in large areas had not delivered the vote; ordinary Filipinos had cast their ballots for a man who voiced their aspirations.

The "Time of Magsaysay"

In the language of the farmer the administration that began with the inauguration of "their" president before more than 250,000 cheering citizens on Manila's Luneta on Dec. 30, 1953, has become known as the "time of Magsaysay." It has been a period of soaring expectations that repeatedly foundered upon the hard realities of entrenched political opposition to drastic reform, chiefly in Congress, and the lack of a body of tested guides by which the Philippine republic could better life for its citizens. But the last 2½ years of the first decade of independence also witnessed substantial achievements when government became more responsive to the needs of Filipinos and acquired better competence to meet them. It was a time when more creative values won acceptance. A thoughtful Filipino explained: "Before the war our big landowners used to brag about how roughly they treated their tenants. Now they talk about how well off their people are."

Symbolic of the spirit that Magsaysay brought to Malacañang, the "palace" of the chief executive on the bank of the Pasig river, is the Presidential Complaints and Action committee he

RECEPTION HALL of Malacañang palace, Manila, the "White House" of the Philippines



established for any and everyone seeking redress through government. On his first day in office the new president announced that the bureau of posts and telegraph would accept all telegrams addressed to him for a charge of ten centavos each. Citizens also were invited to write him, or they could bring their complaints in person. The P.C.A.C. was established in a wing of Malacañang to receive these complaints and the stream of callers who came singly or in delegations, all intent upon telling their story to the president. A team of youthful investigators, again headed by former guerrillas, sorted the complaints and on behalf of Magsaysay sought explanations from appropriate government officials. When personal action by the president was needed to help someone in trouble, Magsaysay usually responded with characteristic vigour. Almost overnight officials long callous toward the needs of simple people acquired a new respect for public opinion; complaints which totalled more than 50,000 annually became an effective means for citizens to help root corruption out of government.

Organized labour has "come of age" under the Magsaysay administration and is today among the more powerful of the new forces moulding institutions within the republic. In a belated attempt to win labour votes the Quirino administration in 1953 abandoned compulsory arbitration and enacted the "Magna Carta of labour" patterned substantially after the Wagner act in the United States. Upon assuming office Magsaysay named as secretary of labour Col. Eleuterio Adevos, wartime organizer of the Hunter's R.O.T.C. guerrillas, who at the age of 32 had been the shrewd, energetic chairman of the Magsaysay for President Movement. During his term in office labour unions have doubled in number from 836 to more than 1,700, including some company unions, and union membership has grown from 300,000 to more than 700,000. Leadership is still inexperienced in some unions, and others suffer from bossism. But in the words of the labour secretary, "Collective bargaining is now the basis of labor-management relations, though big business favors compulsory arbitration and the courts still are somewhat management inclined." Filipino workers in the larger enterprises and national government employees are receiving the minimum industrial wage of 4 pesos (\$2) daily or more. With rare exceptions agricultural labourers still are denied their legal daily minimum pay of 2½ pesos. Recently the department of labour has begun helping some of the most miserable workers in the Philippines, the *sacadas*, or migratory field hands who labour on the sugarcane plantations of Negros for as little as 90 centavos a day and are victimized by "contractors." Despite congressional attempts to cripple such efforts by cutting the labour department budget, concern for the welfare of workers is recognized as a field for public action. Significantly, it is premised on the philosophy that by expanding the consuming power of workers a healthy base for the economy will be created.

Magsaysay has chosen as a major breakthrough point for his administration the Agricultural Credit and Cooperative Financing administration, begun with United States assistance under the previous administration. A tough-minded 40-year-old army colonel, Osmundo Mondofedo, is in charge of an organization that has helped start nearly 300 co-operatives with about 150,000 members. It is systematically cutting in on the marketing monopolies with which Chinese and other middlemen formerly enriched themselves at the expense of farmers. Credit which once was available to villagers at best on usurious terms, with interest rates of up to 100% annually, now is buying carabaos, tools and seeds needed for expanding productivity.

An Agricultural Tenancy commission and a Court of Agrarian Relations are new instruments created in the mid-1950s to attack age-old abuses. A National Resettlement and Rehabilitation administration has moved more than 10,000 families onto public



HIGHWAY OUTSIDE MANILA. Roadbuilding was an important part of the domestic program of the Magsaysay government

land and is buying a few large haciendas for resale to tenants. Concern for the little Filipino is evident in the department of agriculture. Sales of large tracts of public land to single purchasers are being curtailed, and instead most of the public domain is reserved for small homesteaders. An acutely felt need on the part of many small farmers in recently settled areas has been for titles to their land that would afford security and collateral for bank loans. With United States aid the bureau of lands has been modernized and titles are being issued at several times the earlier rate.

Drinking water is highly valued in barrios where villagers sometimes during the dry season must carry it three miles or more in five-gallon kerosene tins. In the first flush of postinauguration enthusiasm Magsaysay promised 10,000 wells in one year—it was estimated that 56,000 wells were needed then and another 2,400 required annually to keep pace with population increase. So far more than 2,000 deep and shallow community wells have been dug. Over 4,000 schoolhouses have been built, with

army engineers supervising prefabrication and transportation of these buildings. Through the International Cooperation administration the United States has helped construct a system of main highways opening virgin lands on Mindanao and other thinly peopled islands. Roads linking the barrios with major transportation routes are wanted by farmers anxious to market their crops.

Under a recently evolved "partnership" principle the national government matches village contributions in labour or kind toward such construction.

The pernicious system of barrio, municipal and provincial dependence upon the national government continues and will remain an obstacle to progress at least until tax collection is decentralized. But the paternal attitude toward local government it encourages is being partly overcome by a new law that weakens the power of the *cacique*. Sponsored by Senator Cabili, a close supporter of Magsaysay, this Barrio Self-Government act permits the villagers to elect their own councils. The barrio lieutenant who formerly depended upon the municipal mayor for his position now must answer to his neighbours, and there is evidence of greater self-confidence and initiative in many villages.

Old Problems Remain

Despite these encouraging efforts of the Magsaysay administration, the chronic ills inherited from the past remain the greatest threat to the well-being of the republic on its tenth anniversary. Unemployment is the most acute symptom. Almost 2,000,000 Filipinos—more than one out of every five in the labour force—are jobless. Included in this number are approximately 200,000 college graduates. While a family system that

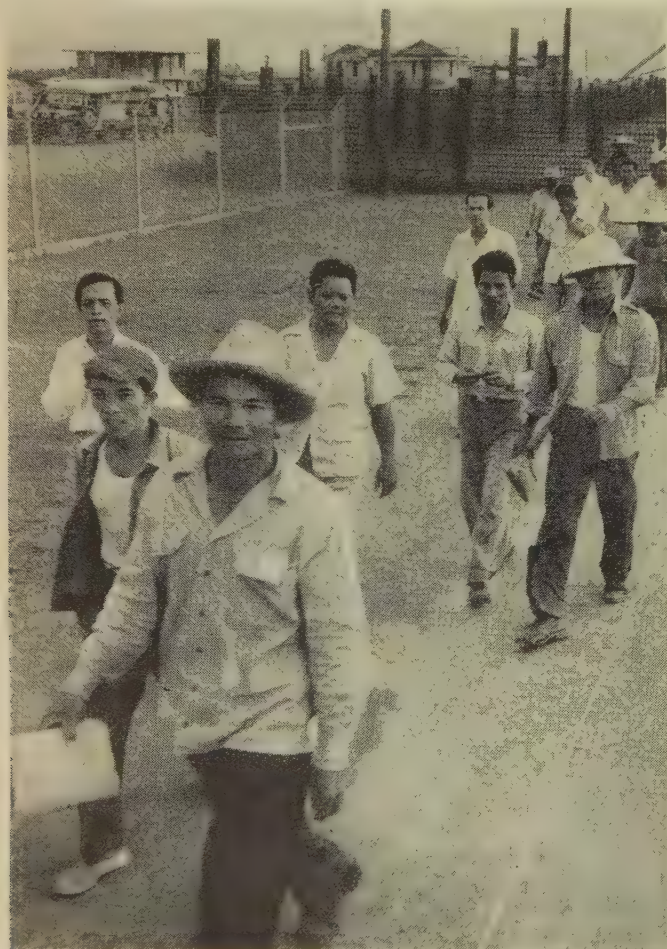
provides for the less fortunate minimizes suffering, this severe restriction of opportunity has a corrosive effect. Cattle rustling and banditry, still common in some provinces, disillusionment among educated young Filipinos, and overstuffed government bureaus all relate to the stagnant nature of the economy in a land where perhaps 90% of the wealth is owned by less than 10% of the citizens. The ravages left by the war have largely been covered by new construction, and sugar centrals and coconut oil mills have been restored to better than prewar productivity. A mining boom in base metals and growing exploitation of the forests for export of Philippine mahogany promise to help ease the nation's dollar shortage within a few years. In the meantime a small consumer goods manufacturing industry is emerging, providing such things as school crayons and pencils, undershirts, paints and pianos that formerly were imported. But this limited development has not nearly kept pace with population growth.

In the first decade of independence the majority has shown little respect for minorities, particularly the "alien" Chinese who number about 350,000 and have controlled about three-fourths of the retail trade and an equal percentage of the rice mills and provided other service functions. A Retail Trade Nationalization law enacted early in 1954 is the severest measure yet in a politically popular trend toward limiting economic and professional opportunities to Filipinos. Denied the right to purchase real estate and threatened with loss of their retail enterprises, the Chinese have restricted credit and shied away from much of the industrial development in which their capital and skills could have played a vital part.

An issue that increasingly plagues the republic concerns the role of religion in education and politics. Throughout the period of United States administration the dominant Roman Catholic Church had pressed for an opportunity to teach its faith in the public schools. A compromise dating from the administration of Gov. William Howard Taft permitted instruction in religion in the school buildings outside class hours for a limited number of sessions each week. The constitution in 1935 provided for a continuation of this practice. After Magsaysay's election, secretaries of education friendly to the Catholic Church viewpoint were appointed. A year later earlier precedents were reinterpreted to permit optional religious instruction during class hours. This aroused the opposition of Protestant churches and large native religious groups, including the Philippine Independent Church and the Iglesia Ni Cristo, which claimed that their rights were being threatened. During the elections for nine senators and provincial and local officials in 1955, two candidates for the senate appealed to the electorate on the grounds that they would urge the Catholic position, and won.

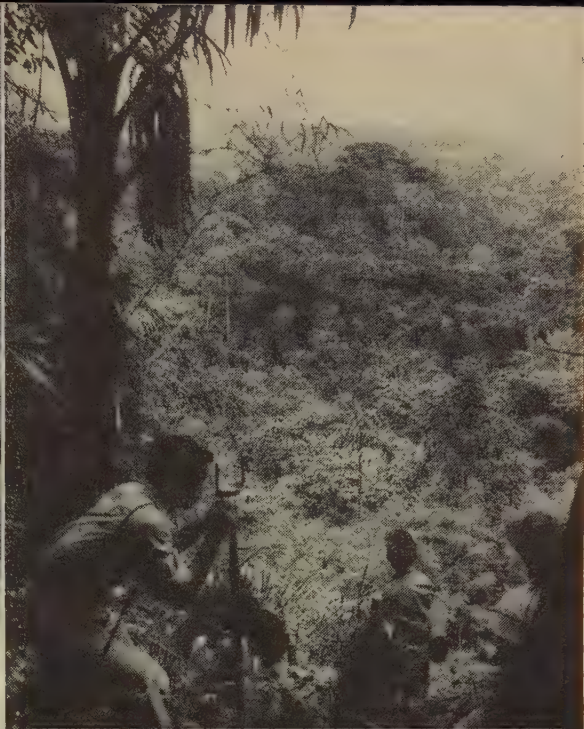
At a time when the republic is in critical need of rational leadership the public schools are deteriorating at a pace that disturbs all conscientious educators. Most notable is the lowering in standards of English instruction; reputable colleges find that up to half their freshmen applicants do not command sufficient English to master their textbooks and must often be given a year of preparation in English before they can become full-fledged students. Less scrupulous are some of the commercialized colleges that earn handsome dividends for their stockholders while offering inferior instruction to Filipino youth who are avidly in search of learning. A promising beginning in meeting the educational crisis has been made in the public schools with vernacular instruction during the first two years. The University of the Philippines and several of the better large private institutions which have been rebuilt and expanded offer education with credits recognized in the United States and Europe. But the Philippines lacks the centres for research, particularly in the humanities, from which could come the ideas the republic requires to chart its own sound course.

PETROLEUM WORKERS returning home from their jobs at Batangas refinery. Unemployment remained high in 1956—about one-fifth of the labour force



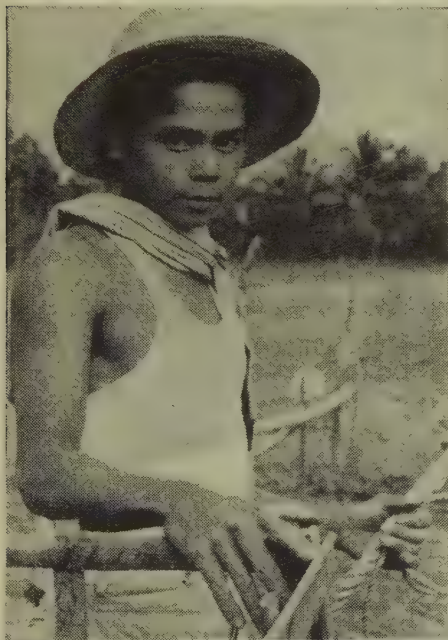


Above: Inspection of pulp at a pineapple canning plant. More establishments are devoted to food processing than to any other manufacturing activity in the Philippines



Right: Foresters surveying Makiling National park. The Philippines is one of the world's largest lumber-producing countries

Below: The Filipino farmer is the heart of the domestic economy. Of the 16,500,000 ac. of land farmed, about 7,310,000 ac. produce rice, the staple food of the Philippines

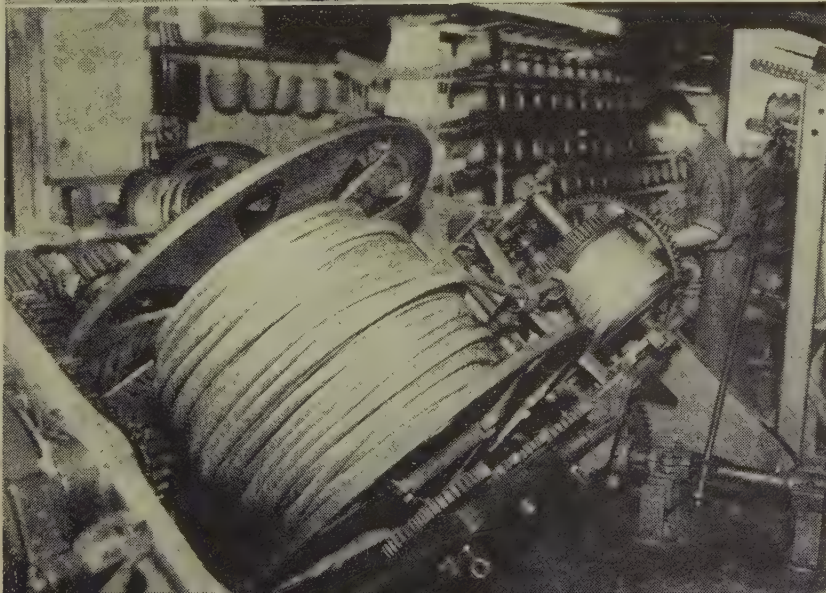


Above: Petroleum refinery at Batangas, a post-World War II development, the first such plant in the Philippines

ASPECTS OF THE PHILIPPINE ECONOMY

Below, left: Ropemaking in a Manila factory. Rope and other products of the abacá plant are important exports

Below, right: Gold miner of Luzon. Gold has been mined in the Philippines since the 14th century





WORLD AFFAIRS: The importance of the Philippines as a Western-style democracy in the Far East was signified by the founding of the Southeast Asia Treaty organization (SEATO) at Manila in 1954. Photograph shows U.S. Secretary of State John Foster Dulles (first row, second from far right) addressing the convention, Sept. 8, 1954

Young Republic in the Pacific

Because of their long and intimate ties with the West, Filipinos today know more about the United States and Spain than they do about their nearest neighbours—Indonesia, Vietnam and China. While they treasure the benefits they feel this association has brought them, there is a widely held view that the Philippines should take its place as one of the coming new nations of Asia. Since independence the republic has increasingly made itself heard in international councils at the United Nations and within its specialized agencies, at Bandung and at regional meetings such as a southeast Asian conference on coconuts held during 1956 in Manila. There its voice has been one of moderation, often explaining East and West to each other and siding staunchly with the democracies against the Communist world. But Philippine capacity to perform in this delicate role is severely restricted by the same handicap that hobbles the republic in formulating a fully independent foreign policy—the lack of Filipinos trained in the languages and cultures of other Asian countries. The infant foreign service has suffered from political patronage, particularly during recent years. Sensitive neighbouring nations that might learn much from the Philippines tend to hold themselves apart, feeling that the cultivation of interests should be mutual.

Japan by contrast seems bent upon making the Philippines its largest supplier of raw materials as well as a major customer

U.S. VICE-PRESIDENT NIXON and Mrs. Nixon touring Corregidor in a Jeep with Pres. and Mrs. Ramón Magsaysay in 1956. Nixon represented the U.S. at the ceremonies marking the tenth anniversary of Philippine independence



in southeast Asia. Trade between the two countries that languished for ten years after the war moved into a much more vigorous tempo with the 1956 agreement on reparations. Under this arrangement Japan is to compensate for wartime destruction with more than \$500,000,000 worth of capital goods and services and some cash to be supplied over the next 20 years. Already Japan is the biggest buyer of Philippine timber products, taking logs which are converted into plywood for export to America and Europe. Iron and copper mines are being developed in the Islands with the help of Japanese capital and technicians. And indications are that joint Philippine-Japanese enterprises will burgeon when relations between the two countries are fully normalized. The resentment against the Japanese still felt by the mass of ordinary Filipinos is not shared by Manila's bustling business community which sees the promise of greatly expanded commerce.

Philippine ties with the United States are being steadily modified in response to domestic pressures in the Islands and the demands of Pacific security. The Laurel-Langley agreement signed in 1955 substantially released the Philippines from onerous terms of the economic commitments made between the two countries at the time of independence. The authorities in Manila now are free to set their own value on the peso. Customs duties can be collected on United States merchandise entering the Philippines at a more rapidly accelerating rate than on goods moving from the Islands to the United States. And the Philippines affords Americans equal economic opportunities with those available to Filipinos in the United States. The United States continues to spend heavily for veterans' benefits in the Islands and recruits some Filipinos into its armed forces as provided by agreement with the republic. On the tenth anniversary of Philippine independence the United States agreed to relinquish its claims to ownership of the vast complex of military bases in the Islands and thereby removed the chief irritant between the two countries. These bases serve both the defense of the Islands and as the principal United States strategic leverage point for influencing the course of events in southeast Asia, where the Philippines as a member of SEATO (the Southeast Asia Treaty organization) is committed to co-operative defense of the region.

Philippine Lesson

The "great experiment," as the past half-century of Philippine-United States relations sometimes is termed, has been condemned and applauded by both Asians and Westerners. It does not fit into neat categories with their stereotypes about imperialism and oppressed colonials. Likewise, Filipinos today are not caught up in a national preoccupation with rejection of everything the white man has brought except his gadgets. While the Filipino has retained his love of fiestas, cockfights and long siestas, he has added



INDEPENDENCE DAY, July 4, 1956. The flag of the Philippines is raised on the staff where ten years earlier the U.S. flag was lowered for the last time

a growing mastery of the democratic approach. Initially, this was restricted to a rather narrow form of representative government. But in the first decade of independence amidst all the handicaps that a war-ruined country held for its citizens this ideal has been given a far wider and deeper application. Herein lies the great triumph of the Filipinos; that in spite of all the hazards and temptations of an uncertain era they chose democratic solutions with

all their imperfections. And there have been men and women sufficiently dedicated to give content to this choice. At a time when the rigorous demands for survival soon force abandonment of that which does not work, Filipinos are setting Asia an example which may not qualify as an elaborate "show window" but which does hold promise for the republic. "

1957

1956

JANUARY							JULY						
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FEBRUARY							AUGUST						
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1958

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JUNE							DECEMBER						
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JANUARY 1957

- 1 New Year's day.
- 3 First session of 85th U.S. congress convenes.
- 4 Independence day, Burma.
- 6 Epiphany, or Twelfth Night.
- 11 200th anniversary, birth of Alexander Hamilton, U.S. statesman, first secretary of the treasury.
- 19 150th anniversary, birth of Robert E. Lee, U.S. general, commander in chief of the Confederate armies.
- 26 Australia day.
- 26 Anniversary of the Proclamation of the Republic, India.

FEBRUARY

- 2 Candlemas. Purification of the Virgin.
- 2 Ground-hog day.
- 8 Boy Scout day, U.S.
- 12 Lincoln's birthday, 1809.
- 14 St. Valentine's day.
- 17 Septuagesima Sunday.
- 22 Washington's birthday, 1732.
- 27 150th anniversary, birth of Henry Wadsworth Longfellow, U.S. poet.

MARCH

- 2 Texas Independence day.
- 3 Quinquagesima Sunday.
- 5 Shrove Tuesday, Mardi Gras.
- 6 Ash Wednesday.
- 10 First Sunday in Lent.
- 12 Girl Scout day, U.S.
- 15 Ides of March.
- 17 Purim (Jewish festival).
- 17 St. Patrick's day, patron saint of Ireland.
- 20 Equinox (9:17 P.M. Greenwich civil time), beginning of spring.
- 25 Annunciation, Quarter day.
- 30 Seward's day, Alaska.

APRIL

- 1 All Fools' day.
- 7 Passion Sunday.
- 13 Thomas Jefferson's birthday, 1743.
- 14 Palm Sunday.
- 14 Pan American day.
- 16 Jewish Passover, 1st day.
- 18 Maundy Thursday.
- 19 Good Friday.
- 19 Patriots' day, U.S.
- 21 Easter Sunday.
- 22 Easter Monday.

THE year 1957 of the Christian Era corresponds to the year of Creation 5717-5718 of the Jewish calendar; to the year 1376-1377 of the Mohammedan hejira; to the 181st year of the United States; and to the 189th year of the *Encyclopaedia Britannica*.

- 25 Anzac day, Australia and New Zealand.
- 26 Confederate Memorial day (also May 10, May 30, June 3).
- 29-30 Annular eclipse of the sun, invisible at Washington, D.C. (date as of Greenwich civil time).

MAY

- 1 May day, International labour festival.
- 12 Mother's day, U.S.
- 13-14 Total eclipse of the moon, partly visible at Washington, D.C. (date as of Greenwich civil time).
- 14 350th anniversary of the founding of the first permanent English settlement in North America at Jamestown, Virginia.
- 17 Empire day, Canada.
- 17 Constitution day, Norway.
- 18 Armed Forces day, U.S.
- 20 Victoria day, Canada.
- 24 Empire day, U.K.
- 26 Rogation Sunday.
- 30 Ascension day.
- 30 Memorial (Decoration) day, U.S.
- 31 Union day, Union of South Africa.

JUNE

- 5 Shabuoth (Jewish Pentecost), 1st day.
- 9 Pentecost (Whitsunday).
- 10 Whitmonday.
- 11 Kamehameha day, Hawaii.
- 13 Trooping the colour in honour of Queen Elizabeth II's birthday. Her majesty was actually born on April 21, 1926.
- 14 Flag day, U.S.
- 16 Trinity Sunday.
- 16 Father's day, U.S.
- 17 Bunker Hill day, U.S.
- 20 Corpus Christi.
- 21 Solstice (4:21 P.M. Greenwich civil time), beginning of summer.
- 24 Midsummer day, Quarter day.
- 24 St. John's day.

JULY

- 1 Dominion day, Canada.
- 4 Independence day, U.S.
- 4 150th anniversary, birth of Giuseppe Garibaldi, Italian patriot and soldier.
- 4 Independence day, Philippines.
- 5 Independence day, Venezuela.
- 9 Independence day, Argentina.
- 12 Orangeman's day, Northern Ireland.
- 14 Bastille day, France.
- 15 St. Swithin's day.
- 21 Independence day, Belgium.
- 25 Constitution day, Puerto Rico.
- 28 Mohammedan year 1377 begins at sunset.
- 28 Independence day, Peru.

AUGUST

- 1 Lammas day.
- 1 Founding of the Confederation, Switzerland.
- 6 Tishah B'Av (Jewish Fast of Ab).
- 6 Feast of the Transfiguration.
- 14 Independence day, Pakistan.
- 15 Assumption of the Blessed Virgin Mary.

SEPTEMBER

- 2 Labor day, U.S.
- 6 200th anniversary, birth of the Marquis de La Fayette, French general and statesman.
- 15 100th anniversary, birth of William Howard Taft, 27th president and 10th chief justice of the United States.
- 16 Independence day, Mexico.
- 17 Citizenship day, U.S.
- 23 Equinox (7:27 A.M. Greenwich civil time), beginning of autumn.
- 26 Rosh Hashanah (Jewish holiday beginning year 5718), 1st day.
- 26 New Zealand day.
- 29 Michaelmas, Quarter day.
- 30 Feast of St. Jerome.

OCTOBER

- 4 Feast of St. Francis of Assisi.
- 5 Yom Kippur (Jewish day of Atonement).
- 10 Sukkoth (Jewish Feast of Tabernacles), 1st day.
- 12 Columbus day.
- 18 Alaska day, Alaska.
- 23 Total eclipse of the sun, invisible at Washington, D.C. (date as of Greenwich civil time).
- 24 United Nations day.
- 31 Halloween.

NOVEMBER

- 1 All Saints' day. Allhallows.
- 2 All Souls' day.
- 5 General election day (in certain U.S. states).
- 5 Guy Fawkes day.
- 7 Total eclipse of the moon, invisible at Washington, D.C. (date as of Greenwich civil time).
- 7-8 The October Revolution, U.S.S.R.
- 11 Martinmas, or St. Martin's day.
- 11 Veterans (formerly Armistice) day.
- 11 Remembrance day, Canada.
- 16 50th anniversary, admission of Oklahoma to the union as the 46th state.
- 28 Thanksgiving day, U.S.
- 30 St. Andrew's day, patron saint of Scotland.

DECEMBER

- 1 First Sunday in Advent.
- 6 Feast of St. Nicholas.
- 6 Independence day, Finland.
- 8 Feast of the Immaculate Conception.
- 17 150th anniversary, birth of John Greenleaf Whittier, U.S. poet and abolitionist.
- 18 Hanukkah (Jewish Feast of Dedication), 1st day.
- 22 Forefathers' day (also Dec. 20, Dec. 21, Dec. 23), U.S.
- 22 Solstice (2:49 A.M. Greenwich civil time), beginning of winter.
- 25 Christmas, Quarter day.
- 28 Childermas, Holy Innocents' day.
- 30 Rizal day, Philippines.
- 31 New Year's Eve (Hogmanay).

CALENDAR OF EVENTS • 1956

JANUARY

1 Sudan became an independent republic, ending an Anglo-Egyptian condominium created in 1899.

2 New west German army's first 6 company-size units were established.

William V. S. Tubman was inaugurated for a 3rd 4-yr. term as president of the west African republic of Liberia.

U.S. Agriculture Secy. Ezra T. Benson reported that rising marketing costs were responsible for the fact that falling farm prices had not resulted in lower retail food prices.

3 2nd session of the 84th congress formally opened in Washington, D.C.

Yugoslavia and U.S.S.R. signed a preliminary agreement in Moscow providing for Soviet construction of an experimental atomic reactor in Yugoslavia.

4 Queen Elizabeth II of the United Kingdom approved the appointment of Arthur Michael Ramsey, bishop of Durham, as archbishop of York.

Communist China and U.S.S.R. were linked when new railway through the Mongolian people's republic was officially opened.

5 Pres. Dwight D. Eisenhower in his annual state of the union message to congress asked for strengthening of U.S. military establishment and free world alliance.

English-language newspaper Moscow News appeared in Moscow for the first time in 7 yr.

India and U.S. signed an agreement in New Delhi providing \$10,000,000 for 100,000 tons of steel for Indian railways.

6 Landings on Antarctica by the advance party of a soviet expedition were reported by Moscow radio.

A Soviet delegation offered economic and technical assistance to Liberia.

7 Yugoslav Pres. Tito denounced the Middle East Treaty organization, stating that it did not serve the interests of the people of the middle east.

8 U.S. Secy. of State John Foster Dulles protested to Jordan the inadequacy of police protection for U.S. lives and property in Jordan against recent mob violence.

9 Costa Rica and Nicaragua signed agreements in Washington, D.C., designed to avoid future border hostilities, and granting a conciliation committee free access to both countries.

Pres. Eisenhower in a special farm message to congress urged the creation of a \$1,000,000,000 soil bank plan to compensate farmers for reducing crop production and improving soil fertility.

Samir el-Rifai formed a new Jordanian cabinet pledged against Jordanian participation in the Middle East treaty organization.

10 British government ordered 2 battalions of paratroopers to the island of Cyprus in the Mediterranean.

Hubert Ney, leader of the pro-German Christian Democratic party, was elected premier of the Saar by the *Landtag*.

U.S. International Cooperation administration announced the allotment of \$50,000,000 to India for economic development.

Jordanian government charged that Egyptian and Saudi Arabian broadcasts helped instigate the violence which swept Jordan during the preceding 4 days.

11 French government ordered the Kabylia mountain area on the coast of Algeria placed under military rule.

12 Pres. Eisenhower asked congress to approve a 5-yr., \$2,020,000,000 program for aid for public school construction.

U.S. Federal Bureau of Investigation announced the solution of the \$2,775,295 robbery of Brink's armoured car headquarters in Boston in 1950.

13 Pres. Eisenhower named a board of 8 citizens to monitor the activities of the U.S. Central Intelligence agency and other units gathering security information.

15 Text of the 6th Soviet 5-yr. plan (1956-60) published by the Soviet press contained the

most complete statistical picture of U.S.S.R. industrial production in 20 yr.

16 Pres. Eisenhower sent to congress a national budget for the fiscal year beginning July 1, 1956, which estimated expenditure at \$65,900,000,000 and revenue at \$66,300,000,000, leaving a prospective surplus of \$400,000,000.

Harlow H. Curtice, pres. of General Motors Corp., announced that his company would spend \$1,000,000,000 on expansion and improvements in 1956.

Egyptian Premier Gamal Abdel Nasser proclaimed a new republican constitution subject to approval in a national referendum.

Soviet government announced that it was prepared to establish diplomatic and trade relations with all Latin American countries with which such relations did not already exist.

17 Ford Motor Co. stock was sold to the public for the first time; the Ford foundation's block of 10,200,000 shares was sold for \$642,600,000 to a group of 722 underwriters for resale.

Long-range water program for development of adequate supplies and prevention of floods was submitted to congress by Pres. Eisenhower.

18 East German Volkskammer approved the creation of a defense ministry and a people's army.

U.S. International Cooperation administration announced approval of a \$37,000,000 program to assist south Vietnam in the resettlement of political refugees from north Vietnam.

19 UN Security council unanimously condemned Israel's raid on Syrian military posts near the sea of Galilee in Dec. 1955.

Indian government announced its decision to nationalize the life insurance business.

The Sudanese republic (formed Jan. 1, 1956) was admitted to the Arab league as its 9th member.

Pres. Eisenhower denied charges by Gen. Matthew B. Ridgway, former army chief of

staff, that reductions in the U.S. armed forces had been made for political reasons.

20 Pres. Eisenhower accepted the resignation of Rowland R. Hughes as budget director and named Deputy Director Percival F. Brundage to the post.

21 U.S. government accused Communist China of demanding a free hand in Formosa as its price for renouncing the use of force.

U.S. and Nicaragua signed a treaty of friendship, commerce and navigation at Managua, Nic.

22 French security forces in Algeria reported that 61 rebels had been killed in a 2-day drive.

23 Argentine government announced the arrest of several groups of subversive plotters and seizure of 2 clandestine radio stations.

24 Pres. Eisenhower in his annual economic report to the U.S. congress stated that the national economy appeared to be on the upswing despite some lags.

U.S. antitrust suit against the American Telephone and Telegraph Co. was settled by a consent decree opening the company's patents to all applicants.

Governors of Georgia, Mississippi, South Carolina and Virginia agreed to stand together in opposing the U.S. supreme court's ruling voiding racial segregation in public schools.

25 International Business Machines Corp. agreed to a broad antitrust consent decree to license patents and to sell rather than lease some of its products.

26 Pres. Giovanni Gronchi of Italy opened the 7th winter Olympic games at Cortina d'Ampezzo, It.

Pres. Eisenhower requested the U.S. congress to authorize a 5-yr. \$250,000,000 program to expand construction of medical research and teaching facilities.

Bolivia was allotted \$20,000,000 by the U.S. International Cooperation administration for development assistance.

U.S.S.R. formally returned to Finland the Porkkala naval base south of Helsinki in Finnish territory.

27 Tanka Prasad Acharya was sworn in as premier of Nepal ending 11 months of direct rule by King Mahendra.

For elections and disasters of 1956, see under those headings in the text. For obituaries of prominent persons who died during 1956, see under the entry Obituaries.

JANUARY—Continued

28 Pres. Eisenhower rejected a Soviet offer of a 20-yr. treaty of peace and friendship with the U.S.

Warsaw treaty nations accepted the east German army into their defense organization.

Queen Elizabeth II of the U.K. and the duke of Edinburgh arrived in Lagos, Nig., for a 3-week ceremonial tour.

29 Soviet government made public a detailed report stating that planned increases in industrial production for 1955 had been largely achieved.

30 British Prime Minister Sir Anthony Eden arrived in Washington, D.C., for policy discussions with Pres. Eisenhower.

U.S. Securities and Exchange commission put into effect revised rules governing the solicitation of proxies for use at corporate shareholders' meetings.

31 French national assembly confirmed (420 to 71) Socialist Guy Mollet as premier.

Juscelino Kubitschek was formally inaugurated as president of Brazil for a 5-yr. term.

FEBRUARY

South African government ordered the U.S.S.R. to close its consulates in Pretoria and Capetown and all its other agencies in South Africa.

Pres. Eisenhower and British Prime Minister Eden in an 8-point declaration at the end of their conference at Washington, D.C., cautioned the countries of Asia and Africa against looking to the U.S.S.R. for economic and political aid.

2 Pres. Eisenhower signed a compromise bill raising the authority of the Small Business administration to grant flood and other disaster loans from \$25,000,000 to \$125,000,000.

U.S. International Cooperation administration announced a grant to Nepal of \$2,000,000 to help raise living standards.

Soviet Premier Bulganin in a letter to the state dept. urged Pres. Eisenhower to reconsider his rejection of a proposed 20-yr. treaty of friendship.

3 U.S. government reimposed a ban on travel to Hungary by U.S. citizens.

U.S. Atomic Energy commission announced that it would make available to private business selected data on thermo-nuclear reactions.

Indian and U.S. governments signed a new air transport agreement at New Delhi.

U.S. Export-Import bank announced a loan of \$35,000,000 to Brazil to increase by 50% the capacity of the Volta Redonda steel plant.

4 Soviet government accused the U.S. and Turkey of sending radio-equipped photographic balloons over Soviet territory.

Austria ordered the Communist-controlled World Federation of Trade unions to close its headquarters in Vienna.

5 Soviet athletes won 6 of 24 events in the 7th winter Olympic games which ended at Cortina d'Ampezzo, It.

6 UN Security council unanimously recommended the admission of Sudan to the UN.

Trustees of the University of Alabama voted to suspend Autherine J. Lucy, its first Negro student, because of demonstrations resulting from her attendance at classes.

Norway released 15 Soviet fishing vessels after fining their captains for violating Norwegian territorial waters.

French Premier Mollet was menaced by rioting crowds on a visit to Algiers, Alg.

Louis St. Laurent, Canadian Prime Minister, announced the lifting of a Canadian embargo on arms shipments to the middle east.

7 U.S. senate voted unanimously to create a special 4-member committee to investigate charges of bribery in connection with the senate's consideration of a bill to amend the Natural Gas act.

8 British and Malayan representatives signed an agreement in London to make every effort toward Malayan independence within the commonwealth by Aug. 1957.

Pres. Eisenhower in a special message to congress called for

sweeping changes in the U.S. immigration laws, including drastic revision of the quota system.

U.S., British and French representatives began talks in Washington, D.C., on middle east problems.

Franklin G. Floete was nominated general services administrator to succeed Edmund F. Mansure, who resigned after congressional criticism.

9 Soviet legal journal revealed abolition of a secret police tribunal with power to condemn persons to forced labour camps without trial.

Egyptian government announced in a communiqué that substantial agreement had been reached with the International Bank for Reconstruction and Development for a \$200,000,000 loan to assist in the construction of the proposed Aswan high dam on the Nile.

10 Chinese Communist government announced the initiation of experiments with a 30-letter Latin alphabet to replace the use of ideographs.

Egypt and U.S.S.R. were revealed to have agreed on the establishment, with Soviet aid, of a nuclear laboratory in Cairo for work concerned with the peaceful utilization of atomic energy.

British, French and U.S. ambassadors in western Germany delivered to Soviet authorities protests against increasing paramilitary activities in the Soviet sector of Berlin.

11 Guy Burgess and Donald Maclean, former British diplomats who disappeared in 1951, reappeared at a press conference in Moscow.

Spanish government suspended 2 articles of the bill of rights following antifalangist student demonstrations.

Pres. Eisenhower appointed Edward P. Curtis, vice-pres. of the Eastman Kodak Co., to be his special assistant for aviation facilities planning.

13 Soviet government announced that it would consider the sending of British and U.S. troops to the middle east a threat to peace and a violation of the UN charter.

Indonesia terminated its last

political tie with the Netherlands and announced plans to cancel all financial, economic and cultural treaties.

West Germany and U.S. signed an agreement in Washington, D.C., for co-operation in the field of research in peaceful uses of atomic energy.

14 20th congress of the Soviet Communist party opened in Moscow.

Pres. Eisenhower's physicians, headed by Paul Dudley White, reported after a physical examination that there was no medical barrier to his seeking and serving a 2nd term.

15 Premier Urho Kekkonen was elected president of Finland by the minimum majority of 151 electoral votes.

16 British house of commons approved (293 to 262) the introduction of legislation to abolish or suspend capital punishment.

Israeli Ambassador Abba Eban protested a projected U.S. shipment of 18 tanks to Saudi Arabia.

Pres. Eisenhower ordered a revision of selective service regulations virtually exempting fathers and men over 26.

Shah Riza Pahlavi of Iran arrived in New Delhi for a 3-week state visit to India.

Bank of England increased its bank rate from 4½% to 5½%, the highest rate since 1932.

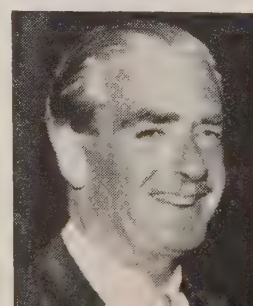
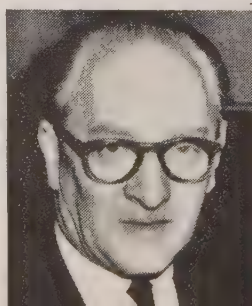
17 Pres. Eisenhower vetoed a bill to amend the Natural Gas act by exempting natural gas producers from price control by the Federal Power commission.

Harold Macmillan, British chancellor of the exchequer, announced the imposition of a number of anti-inflationary measures, including additional restrictions on installment buying.

18 Pres. Eisenhower lifted a 1-day embargo on U.S. arms shipments to the middle east.

The pictures on this page are, left to right:

BENSON.....	Jan. 2
CURTICE.....	Jan. 16
MOLLET.....	Jan. 31
EDEN.....	Feb. 1
WHITE.....	Feb. 14



FEBRUARY—Continued

19 Executive committee of the National Amateur Athletic union suspended Wes Santee, champion mile runner, for receiving expenses in excess of those allowed by amateur rules.

Pres. Eisenhower offered to use part of U.S. farm surplus to relieve suffering in Europe caused by the most severe winter in years.

20 General Motors Corp. issued a preliminary report indicating that its net earnings for 1955 were a record \$1,189,000,000.

21 Israeli Premier David Ben-Gurion called for 150,000 volunteers to bolster Israeli border defenses.

Grand jury at Montgomery, Ala., indicted 115 persons allegedly involved in an 11-week boycott by Negroes of the Montgomery bus system.

Peruvian government announced that an army-led revolt in eastern Peru had almost subsided.

22 Pres. Eisenhower authorized for sale or lease about 88,000 lb. of uranium 235 valued at \$1,000,000,000 for peaceful production of atomic power in the U.S. and abroad.

U.S. senate ordered (79 to 1) an unlimited investigation into lobbying and corrupt political practices.

23 U.S. government turned over to Spain a squadron of 30 jet fighters in a ceremony at Valencia.

Representatives of 5 British Caribbean colonies reached agreement at a conference in London on a plan for the formation of a federation.

24 20th congress of the Soviet Communist party unanimously approved the report of N. S. Khrushchev, party 1st secy., repudiating 1-man rule and draft directives for the 6th 5-yr. plan.

The pictures on this page are, left to right:

SANTEE.....Feb. 19
WYMAN.....Feb. 28
GLUBB.....March 2
HARDING.....March 18
BORGNI.....March 21

25 20th congress of the Soviet Communist party adjourned after electing an enlarged central committee of 133 members, including 53 elected for the first time.

26 Iraq offered Lebanon and Syria any military aid they might request, if Israel should divert the waters of the Jordan river.

27 Pres. Giovanni Gronchi of Italy arrived in Washington, D.C., for an official visit.

South Africa's parliament in joint session approved (174 to 68) a bitterly-fought bill to remove 45,000 voters of mixed blood from the common electoral roll and to restrict the powers of the courts to pass upon the validity of acts of parliament.

28 U.S. Agriculture Secy. Benson announced that all U.S.-owned surplus cotton would be sold in the world market beginning Aug. 1, 1956.

Gen. Willard G. Wyman was named to succeed Gen. John E. Dahlquist as commander of the Continental army command.

29 Somalia, UN trust territory, (formerly Italian Somaliland), held its first national elections.

Pres. Eisenhower announced that he would accept renomination for a 2nd term.

Hobart H. Grooms, U.S. district judge, ordered the University of Alabama to reinstate Negro student Autherine J. Lucy.

Constantin Karamanlis formed a new Greek cabinet composed entirely of members of the National Radical union, which had won a majority in parliamentary elections.

Canada and U.S.S.R. concluded a 3-yr. trade agreement in Ottawa covering the purchase by the U.S.S.R. of 1,200,000 to 1,500,000 metric tons of wheat.

MARCH

U.S. government charged that Soviet balloons had flown over territories of the U.S. and other nations.

University of Alabama trustees permanently expelled Negro student Autherine J. Lucy because of charges made by her against the university.

Iranian government ordered the assistant military attaché of the Soviet embassy in Tehran expelled as a spy.

Afghanistan and U.S.S.R. signed an agreement in Kabul under which the U.S.S.R. agreed to supply materials and equipment for 2 hydroelectric stations and other installations.

2 King Hussein of Jordan summarily dismissed Lt. Gen. John Bagot Glubb, British commander of the Arab legion.

Pakistani constituent assembly completed the adoption of a new republican constitution.

French Foreign Minister Christian Pineau and **Moroccan Premier M'Barek el-Bekai** signed a declaration in Paris recognizing the principle of Moroccan independence.

Karl August Fagerholm, Finnish Social Democrat leader, formed a new coalition cabinet.

Danish Premier H. C. Hansen arrived in Moscow for official conferences with Soviet officials.

3 Jordanian government announced that it would respect its treaty obligations with Great Britain.

4 Several Israeli policemen were reported killed in a clash on the sea of Galilee between Israeli police launches and Syrian shore batteries.

Lt. Col. José María Lemus was elected without opposition to succeed Oscar Osorio as president of El Salvador.

Council of the Socialist International ended a 3-day meeting at Zürich, Switz., by rejecting any form of political co-operation with parties of dictatorship.

5 British Prime Minister Eden announced that 15 top British officers would be withdrawn from the Arab legion as the result of dismissal of Lt. Gen. John B. Glubb.

British Colonial Secy. Alan Lennox-Boyd told the house of commons that negotiations with Greek Cypriot leaders on the future of Cyprus had broken down.

6 Council of the Southeast Asia Treaty organization opened a 3-day meeting in Karachi, Pak.

Pres. Eisenhower in a letter to

Soviet Premier Bulganin published in Moscow and Washington, D.C., called on the U.S.S.R. to join the U.S. in halting production of fissionable materials for war.

King Saud of Saudi Arabia arrived in Cairo for talks with Syrian Pres. Shukri el-Kuwatli and Premier Nasser of Egypt.

Adm. Walter F. Boone was named commander in chief of U.S. naval forces in the eastern Atlantic and Mediterranean areas.

7 Pres. Eisenhower called for urgent and early action by the UN to pacify the middle east.

U.S. and 6 other members of the Southeast Asia Treaty organization promised to stand behind Pakistan in its frontier disputes with Afghanistan.

Virginia constitutional convention adopted a constitutional amendment permitting use of public funds to support private nonsectarian education.

8 Trade agreement between Yemen and U.S.S.R. was announced by the Yemeni legation in Cairo.

Robert Lacoste, French resident minister in Algeria, called for a major military, economic and social effort to check rebellion in Algeria.

Lt. Gen. Henry I. Hodes, U.S. 7th army commander, was named to succeed Gen. Anthony C. McAuliffe as commander in chief of U.S. forces in Europe.

9 King Hussein of Jordan rejected an offer of an Egyptian-Syrian-Saudi Arabian subsidy for the Arab legion conditioned on the dropping of Jordan's British subsidy.

British authorities exiled to the Seychelles Is. in the Indian ocean Archbishop Makarios, Greek political and spiritual leader in Cyprus and head of the anti-British movement.

U.S. consulate general and U.S. information service library in Tunis were wrecked by a French mob.

Lt. Gen. John B. Glubb, former commander of the Arab legion, was knighted by Queen Elizabeth II of the U. K.

10 Cyprus was paralyzed by a general strike protesting the exile of Archbishop Makarios.



MARCH—Continued

11 96 members of U.S. congress issued a declaration pledging themselves to use all lawful means to reverse the 1954 supreme court decision against racial segregation in public schools.

French Premier Mollet arrived in London for conferences with British Prime Minister Eden.

12 U.S. supreme court ordered the University of Florida to admit without delay a Negro applicant to its law school.

U.S. dept. of justice announced seizure of Rumanian gold bullion (frozen in U.S. since 1940) in partial settlement of U.S. war claims against Rumania.

13 French national assembly, approved (455 to 76) the granting of extraordinary powers to Premier Mollet to deal with the Algerian revolt.

U.S. government offered its good offices to find a fair and just solution to the Anglo-Greek dispute over Cyprus.

14 Irish Prime Minister John A. Costello arrived in Washington, D.C., on an official visit.

Jordanian King Hussein and King Faisal II of Iraq, conferred secretly near the Iraqi border.

15 Former Soviet Premier Georgi M. Malenkov arrived in England on a tour of power installations.

Sudan and U.S.S.R. announced an agreement to establish diplomatic relations.

U.S. International Cooperation administration announced that the Philippines had been chosen as the site of the Asian nuclear centre which the U.S. had undertaken to establish.

16 Indian government placed before parliament a controversial draft bill for drastic reorganization of the Indian states.

17 French government announced plans to transfer to Algeria 2 divisions from west Germany and additional troops from West Africa.

18 Field Marshal Sir John Harding, governor of Cyprus, stated that negotiations for self-government would not be resumed until terrorism had been crushed.

19 U.S. state dept. announced that the U.S.S.R. had paid \$724,947.68 in damages for a U.S. navy plane shot down over the Bering sea in 1955.

Pres. Eisenhower in a special

message to congress requested authorization of \$4,672,475,000 for foreign aid in the fiscal year beginning July 1, 1956.

20 Ali Sartromidjojo formed a new Indonesian cabinet without the Communist participation suggested by Pres. Sukarno.

Westinghouse Electric Corp. and International Union of Electrical Workers agreed on contract terms, thus ending a 156-day strike, longest major walk-out in 20 yr.

French Foreign Minister Pin-eau and Premier Tahar ben Ammar of Tunisia signed a protocol in Paris recognizing the sovereignty and independence of Tunisia.

21 U.S. Atomic Energy commission and the British defense ministry announced that the U.S.S.R. had exploded another nuclear device.

Edward Ochab was named to succeed Boleslaw Bierut, deceased, as 1st secy. of the Polish Workers' (Communist) party.

Motion picture "Marty" received the award of the Academy of Motion Picture Arts and Sciences as the best picture of 1955; awards for the best starring performances went to Ernest Borgnine and Anna Magnani.

22 Martin L. King, Jr., Negro minister, was convicted in a state court of illegally conspiring to boycott segregated buses in Montgomery, Ala.

Gen. Ivan A. Serov, head of the Soviet state security committee, arrived in London aboard a Soviet jet air liner to make security arrangements for a visit of top Soviet officials to Great Britain.

23 Pakistan formally became a republic within the commonwealth of nations with Gen. Iskander Mirza as president.

French cabinet approved a series of decrees providing for reforms in Algeria.

British foreign office confirmed reports that several hundred Egyptian officers and soldiers were being trained at Soviet bases in Poland.

24 New east German 5-yr. plan calling for a 55% general production increase, the building of a nuclear power plant and a jet aircraft industry was presented to a special congress of the Socialist Unity (Communist) party.

25 Tunisia's first national legislative elections resulted in complete victory for the National Front.

26 Pres. Eisenhower met at White Sulphur Springs, W.Va., with Canadian Prime

Minister St. Laurent and Mexican Pres. Adolfo Ruiz Cortines.

U.S. supreme court upheld (7 to 2) the constitutionality of the Immunity act of 1954.

Representatives of 11 Communist nations at end of conference in Moscow announced plans for the joint establishment in the U.S.S.R. of an eastern institute for nuclear research.

27 U.S. internal revenue agents seized for nonpayment of taxes the offices of the U.S. Communist party and the *Daily Worker* in New York, N.Y., and several other cities.

U.S. and the Netherlands signed a treaty of friendship, commerce and navigation at The Hague.

U.S. Defense Secy. Wilson appointed Eger V. Murphree, president of Esso Research and Engineering Co., to be czar of U.S. guided missile production.

28 Soviet Communist party newspaper *Pravda* denounced Josef Stalin for having fostered monstrous excesses in his later years.

Iceland's parliament (38 to 18) called for the withdrawal of all U.S. troops from Iceland.

29 Pres. Eisenhower signed a bill extending to April 1, 1957, corporate and excise rates scheduled to be reduced at midnight, March 31, 1956.

Swedish Premier Tage Erlander arrived in Moscow for official conferences with Soviet leaders.

30 East Germany's new armed forces made their first public appearance in east Berlin.

U.S. court of military appeals upheld the authority of military courts to try civilians accompanying the armed forces overseas.

British war office announced plans for the withdrawal from Kenya of 2 battalions of British troops and ancillary units.

31 French police arrested 3,000 persons in Paris to break up an Algerian nationalist parade.

APRIL

1 Argentine government disclosed the arrest of 70 persons for inciting a rebellion in Mendoza province.

2 U.S. supreme court held (6 to 3) that the states had no power to punish persons who advocated the overthrow of the federal government by force or violence.

U.S. Atomic Energy commission announced that the

U.S.S.R. had conducted another nuclear test in its current series.

3 Pres. Eisenhower created a Federal Council on Aging to co-ordinate aid to older people.

4 UN Security council unanimously requested Secy. Gen. Dag Hammarskjöld to survey the middle east situation and attempt to relieve tensions.

Indian government and a British construction syndicate concluded an agreement for the construction of a \$280,000,000 integrated iron and steel plant.

5 Heavy Egyptian-Israeli fighting was reported in the Gaza strip area.

6 Argentine government placed the Argentine armed forces under wartime regulations.

West Germany was revealed to have sent notes to the U.S., Britain, France and Belgium reiterating its refusal to pay the equivalent of \$760,000,000 annually toward support of NATO forces in west Germany.

7 Libyan government announced a major increase in U.S. economic and military aid.

Spain and Morocco signed in Madrid a joint declaration and protocol recognizing in principle Morocco's independence and unity.

8 Spanish Foreign Minister Alberto Martin Artajo arrived in Washington, D.C., for formal talks with U.S. officials.

Soviet communist party and council of ministers told the Soviet people that agricultural production must be raised drastically if a better standard of living were to be achieved.

9 U.S. supreme court held (5 to 4) that New York city did not have the right to dismiss a college professor for invoking the protection of the 5th amendment.

U.S. government pledged opposition to aggression in the middle east within constitutional means.

6 U.S. marine recruits were drowned in a swamp during a disciplinary night march at Parris Island, S.C.

Pres. Eisenhower asked congress to authorize an increase of \$547,100,000 in defense spending in the fiscal year beginning July 1, 1956.

10 Yemen and Saudi Arabia were revealed to have signed a mutual defense agreement.

Pres. Eisenhower in a letter to congressional leaders urged higher pay and better living conditions to halt the heavy turn-

APRIL—Continued

over of trained military personnel.

11 Livingston T. Merchant, U.S. asst. secy. of state, was named to succeed Robert D. Stuart as U.S. ambassador to Canada.

Soviet Premier Bulganin declared that the forthcoming visit of Soviet leaders to Great Britain was not intended to undermine the close ties between the U.S. and British governments.

U.S. senate rejected (59 to 27) a resolution to create a joint congressional committee to supervise the Central Intelligence agency.

Pres. Eisenhower signed a bill authorizing a \$760,000,000 flood control and reclamation project on the upper Colorado river.

12 Federal Reserve board approved increases in discount rates for all but 1 of the 12 U.S. Federal Reserve banks.

Israeli jet fighters shot down an Egyptian jet fighter over the central Negev desert area.

Solomon W. R. D. Bandaranaike formed a new Ceylonese cabinet following a sweeping victory in parliamentary elections.

13 U.S. navy announced the dispatch of a division of 4 destroyers to the Mediterranean.

North Atlantic council announced the retirement at his request of Gen. Alfred M. Gruenther as supreme allied commander in Europe and designated Gen. Lauris Norstad to succeed him late in 1956.

Tunisian constituent assembly approved article 1 of Tunisia's first constitution vesting sovereignty in the people.

Pres. Eisenhower designated James Durfee (Wis.) as chairman of the Civil Aeronautics board.

14 U.S. aircraft carrier "Saratoga," largest and most powerful warship in the world, was commissioned at the New York naval shipyard, Brooklyn, N.Y.

Electronic device for recording TV programs on magnetic tape for immediate or delayed playback was demonstrated in Chicago, Ill.

15 Israeli Premier David Ben-Gurion in an independence day broadcast asserted that Egypt was planning to slaughter Israel.

U.S. senate subcommittee recommended enactment of a total disclosure law requiring all private welfare and pension

plans to open their books to government inspection.

16 Austria was admitted to membership in the Council of Europe at a meeting of its council of ministers.

Pres. Eisenhower vetoed the proposed Agricultural act of 1956 providing among other things for reinstitution of rigid price supports for basic farm commodities.

2nd annual meeting of the Middle East Treaty organization convened at Tehran under the chairmanship of Iranian Premier Hussein Ala.

Chilean government announced sweeping changes in the Chilean foreign exchange system, including the introduction of a free exchange rate.

17 Soviet government offered to support a UN settlement of the Arab-Israeli conflict.

Anton Yugov was named to succeed Vulko Chervenkov as premier of Bulgaria.

Harold Macmillan, British chancellor of the exchequer, presented to the house of commons a budget for the fiscal year beginning April 1, 1956, which estimated revenue at £5,197,500,000, expenditure at £4,737,685,000.

18 Soviet Communist party newspaper *Pravda* announced the dissolution of the Communist Information bureau (Cominform).

U.S. state dept. announced an agreement among 12 nations, including the U.S.S.R., on a charter for the International Atomic Energy agency.

U.S. house of representatives sustained (211 to 202) Pres. Eisenhower's veto of the proposed Agricultural act of 1956.

Cleo F. Craig, pres. of American Telephone and Telegraph Co., announced that his company would spend a record \$2,100,000,000 for expansion during the next year.

Soviet Premier Bulganin and Communist Party 1st Secy. Khrushchev arrived in London on an official visit.

19 Prince Rainier III of Monaco and Grace Kelly, U.S. film actress, were married in a religious ceremony at Monte Carlo.

UN Secy. Gen. Hammarskjöld announced in Jerusalem that Egypt and Israel had agreed to carry out orders for a cease-fire along their border.

Gold Coast government published at Accra a white paper outlining proposals for independence of the Gold Coast as a full

member of the commonwealth of nations.

Secy. of State Dulles in a letter to Cambodian Foreign Minister Nong Kinny denied reports that the U.S. was trying to force Cambodia to join the South East Asia Treaty organization by withholding economic aid.

20 Israeli Premier Ben-Gurion told UN Secy. Gen. Hammarskjöld that Israel felt free to resume work at any time on the controversial Jordan river irrigation project.

21 Egypt, Saudi Arabia and Yemen signed a tripartite military defense agreement at Jidda, Saudi Arabia.

Leonard Ross, 10-yr.-old grade school student of Tujunga, Calif., won the \$100,000 top prize on a TV quiz show for answering questions on the stock market.

22 Leading Soviet legal journal denounced the long-prevalent Soviet practice of trial by confession.

Pres. Eisenhower's commission on veterans' pensions issued a report recommending against general pensions for all veterans and urging a tightening of standards in veterans' benefit programs.

Polish government announced an amnesty for political prisoners providing for reduction of sentences or release.

23 U.S. supreme court in effect condemned racial segregation on intrastate buses by dismissing an appeal from a lower court decision holding such segregation to be unconstitutional.

Presidium of Soviet supreme council was revealed to have created a special committee to check on activities of Soviet security organs, including the secret police.

24 Central statistical board of the Soviet council of ministers announced that Soviet industrial production had increased 85% during the 5th 5-yr. plan (1951-55).

25 U.S. government expelled 2 members of the Soviet UN delegation for their part in sending home 5 Soviet seamen who had previously sought asylum in the U.S.

26 U.S. Vice-Pres. Richard M. Nixon formally notified Pres. Eisenhower that he would accept renomination.

U.S. Secy. of Commerce Sinclair Weeks issued a new general licence export order listing over 700 nonstrategic items allowed to be shipped without specific licence to the U.S.S.R. and its European satellites.

Soviet and British leaders issued a friendly joint communiqué upon conclusion of their discussions in London.

27 Rocky Marciano, heavyweight boxing champion, announced his retirement undefeated.

U.S. army dept. made public an order by Army Secy. Wilber M. Brucker that soldiers were not to be adjudged security risks because of association with an allegedly subversive person or group.

28 Canada and India signed an agreement in New Delhi by which Canada agreed to aid in the construction of an atomic reactor in India.

29 British admiralty announced the disappearance of Cmdr. Lionel Crabb, retired navy diver, in Portsmouth harbour, where a Soviet cruiser had been moored during the visit of Soviet leaders to England.

Francisco Franco, Spanish chief of state, denounced his critics as enemies of the state and indicated that he would strengthen the totalitarian structure of his regime.

30 U.S. government warned Poland against the use of pressure to bring about repatriation of refugees granted political asylum in the U.S.

MAY

1 Georgi K. Zhukov, Soviet defense minister, opened the annual Soviet May day military parade with a pledge that the U.S.S.R. sought friendship and peaceful coexistence with all nations.

U.S. Defense Secy. Wilson conceded that the U.S.S.R. was outstripping the U.S. in production of intercontinental planes capable of carrying hydrogen bombs.

Brazilian government announced that it would continue the sale of thorium to the U.S. for use in atomic reactors.

2 King Mahendra of Nepal was crowned in traditional ceremonies at Katmandu.

3 International Bank for Reconstruction and Development announced the loan of \$25,000,000 to Norway to help finance the Tokke hydroelectric project.

UN Secy. Gen. Hammarskjöld in a progress report to the UN Security council reported assurances of a cease-fire among Egypt, Israel, Jordan, Lebanon and Syria.

French Premier Mollet won 3 confidence votes in the national assembly on proposals for tax in-

MAY—Continued

creases to cover limited pension grants to persons 65 and over.

4 U.S. Atomic Energy commission authorized the construction of the first large scale private atomic power plants.

Presidium of the Soviet supreme council published a decree abolishing the special powers of Soviet security organs to deal with sabotage and terrorism.

Pres. Eisenhower told a press conference that the U.S. should not transfer to the UN any substantial part of its foreign aid program.

UN Disarmament subcommittee negotiations in London ended in a deadlock following renewed Soviet rejection of Pres. Eisenhower's aerial inspection plan.

U.S. state dept. disclosed that it had agreed to Rumanian proposals to discuss improved trade relations and war damage and nationalization claims.

5 Detonation of the first nuclear device in a new series of tests by the U.S. Atomic Energy commission and the defense dept. took place at the Eniwetok proving grounds.

6 North Atlantic council at the conclusion of a meeting in Paris named a 3-man committee to study the expansion of NATO's nonmilitary functions.

7 Pres. Tito of Yugoslavia arrived in Paris on a 5-day state visit.

Columbia university announced the award of the 1955 Pulitzer prizes, including one to MacKinlay Kantor for his novel *Andersonville* and one to Frances Goodrich and Albert Hackett for their play *The Diary of Anne Frank*.

International Bank for Reconstruction and Development announced its first loan to Haiti in the amount of \$2,600,000 to finance highway improvements.

8 International Cooperation administration disclosed that the U.S. would supply grain and dry milk to help alleviate a severe food shortage in southern Peru.

9 French cabinet formally approved the call-up of 50,-

000 additional reservists for service in Algeria.

U.S. Atomic Energy commission issued revised personnel security regulations designed to balance national security and individual rights.

U.S. Information agency offices in Athens and the British consulate in Salonika were damaged in riots protesting British death sentences against 2 Cypriot youths.

Pres. Eisenhower signed a bill to curb expansion of bank holding companies but said it fell short of achieving its objectives because of exemptions and other special provisions.

10 Robert Lacoste, French resident minister in Algeria, placed eastern Algeria under a state of martial law.

UN Secy. Gen. Hammarskjöld reported to the UN Security council that he had re-established a cease-fire between Israel and its 4 Arab neighbours and strengthened the truce supervisory machinery.

Austrian government announced that Hungary had agreed to remove mine fields and other obstacles from the entire length of the Austro-Hungarian border.

11 Greek Cypriot terrorist organization on Cyprus claimed that it had hanged 2 British soldiers in retaliation for the execution of 2 Cypriots.

British government was revealed to have apologized to the U.S.S.R. for unauthorized snooping by a retired navy diver near Soviet warships in Portsmouth harbour.

Presidium of the Soviet supreme council published a decree abolishing a 1940 law prohibiting workers from changing their employment without permission.

British Colonial Secy. Lennox-Boyd announced that Britain was prepared to grant the Gold Coast independence within the commonwealth if requested by the newly elected Gold Coast legislature.

12 Pres. Eisenhower's physicians after a thorough medical examination reported that his general condition continued to be good.

French foreign ministry an-

nounced that France had agreed to deliver 12 more jet fighters to Israel.

13 Ernesto de la Guardia, Jr., the government candidate, was elected president of Panamá in national elections.

14 Soviet government announced plans to reduce its armed forces by 1,200,000 men within a year.

Retiring Sen. Walter F. George (D., Ga.) accepted Pres. Eisenhower's appointment as his personal representative and special ambassador for North Atlantic political and economic developments and unity.

Pope Pius XII approved the transplanting of corneas from the eyes of dead persons to restore the sight of the blind.

Pakistani Prime Minister Chaudri Mohammed Ali proposed a \$2,200,000,000 5-yr. plan of economic development.

15 French Premier Mollet and Foreign Minister Pineau arrived in Moscow for talks with Soviet leaders.

Japan and U.S.S.R. signed in Moscow a 10-yr. fishing treaty and a 3-yr. air-sea rescue treaty.

South Korean Pres. Syngman Rhee won a 3rd 4-yr. term in national elections but opposition leader John M. Chang won the vice-presidency.

Negotiations in London collapsed on demands of the colony of Singapore for self-government.

16 Pres. Sukarno of Indonesia arrived in Washington, D.C., on a state visit.

U.S. government invoked its export control authority to block exchange of technical data on oil-well drills with the U.S.S.R.

British supply ministry announced that an atomic device had been successfully exploded at the Monte Bello proving grounds in western Australia.

Pres. Eisenhower submitted to congress a reorganization plan under which army, navy and air force depts. would receive a new asst. secy. for research and development.

17 Soviet government recognized the sovereignty and independence of Cambodia and agreed to an exchange of ambassadors.

Sir Walter Monckton, British defense minister, told the house of commons that British armed forces would be reduced to 700,000 men by 1958 under a reduction schedule announced in Oct. 1955.

18 U.S. and Turkey signed at Ankara an agreement to facilitate exchange of patent rights and technical information for defense purposes.

19 Pope Pius XII condemned artificial insemination as immoral and absolutely illicit.

20 First U.S. hydrogen bomb to be dropped from a plane was exploded over Namu I. in the Bikini atoll.

21 U.S. supreme court held unanimously that state laws prohibiting railroad union shop agreements were invalid.

Selwyn Lloyd, British foreign secy., declared that Britain intended to retain Cyprus and other strategic points, by force if necessary.

22 U.S. Secy. of State Dulles described Egypt's recognition of Communist China as an action which the U.S. regretted.

King Hussein of Jordan designated Said el Mufti to succeed Samir el-Rifai as premier.

French troops razed the village of Ouled Djerrah near Algiers in retaliation for the massacre of 17 French soldiers.

Queen Elizabeth II's consent to an extension of Gov. Gen. Vincent Massey's term of office by 1 yr. (to the spring of 1958) was announced by Canadian Prime Minister St. Laurent.

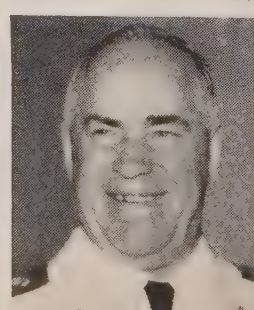
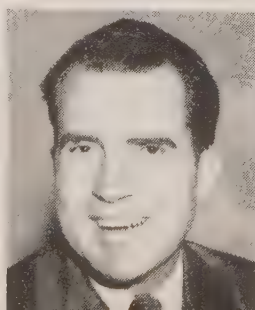
23 UN Educational, Scientific and Cultural organization announced that Bulgaria had become its 75th member.

24 2,500th anniversary of Buddhism was celebrated in ceremonies throughout India.

Maj. Gen. E. L. M. Burns, UN truce chief in Palestine, announced that Egypt and Israel had agreed to implement ar-

The pictures on this page are, left to right:

GRUENTHER.....April 13
NIXON.....April 26
FRANCO.....April 29
ZHUKOV.....May 1
KANTOR.....May 7



MAY—Continued

rangements for establishing UN observation posts along the Gaza strip.

25 British and Soviet governments signed in London an agreement permitting British fishing vessels to come within 3 mi. of the Soviet coast in the Barents sea.

26 Mohammed Ali Ajlouni, Jordanian defense minister, disclosed plans to merge the Arab legion with the Jordanian national guard.

27 French troops sealed off and searched the Casbah of Algiers in a hunt for rebel arms and equipment.

28 France and Morocco signed in Paris accords granting Morocco control over its foreign affairs.

Pres. Eisenhower nominated Frederick A. Seaton of Nebraska to succeed Douglas McKay as secy. of the interior.

India and France signed in New Delhi a treaty effecting the *de jure* transfer to India of the former French Indian settlements of Pondicherry, Karikal, Mahé and Yanaon.

Revised omnibus farm bill was signed by Pres. Eisenhower who deplored the delay of U.S. congress in enacting it.

Chilean and U.S. specialists were revealed to have completed plans for construction of a major airport on Easter I. in the Pacific ocean 2,000 mi. W. of Chile.

29 Execution of D. A. Bagirov, former Soviet leader in Azerbaijan, and 3 other officials for treason and terroristic acts, was revealed.

Pres. Eisenhower requested congress to authorize an additional \$112,500,000 for atomic weapons, military propulsion reactors and an accelerated civilian power reactor program in the 1957 fiscal year.

30 Pres. Eisenhower authorized Gen. Nathan F. Twin-

ing, U.S. air force chief of staff, to accept a Soviet invitation to attend an aviation day show in Moscow.

31 Jordan and Syria announced a military agreement providing for a permanent body for military consultation and joint operations in case of war.

UN command in Korea ordered the withdrawal from South Korea of inspection teams of the Neutral Nations Supervisory commission because of the systematic frustration of its activities by North Korean and Communist Chinese authorities.

JUNE

V. M. Molotov was replaced as Soviet foreign minister by Dmitri T. Shepilov, editor of *Pravda*, but retained his other government and party posts.

Pres. Eisenhower formed a special cabinet-level committee to work on legislative and administrative means of aiding small business.

2 Pres. Tito of Yugoslavia arrived in Moscow for an official visit with Soviet leaders.

Italian government announced a trade agreement with the U.S.S.R. providing for trade increases of 25% in 1956.

3 Soviet government announced the transfer of all-union judicial and certain economic functions to the governments of constituent republics.

Indian Prime Minister Nehru's announcement that the city of Bombay would be under federal control for 5 yr. touched off violent antigovernment rioting.

4 U.S. state dept. released the text of a secret speech by Soviet Communist Party 1st Secy. Khrushchev attacking Josef Stalin at the 20th party congress in Feb. 1956.

UN Security council unanimously adopted a resolution requesting Secy. Gen. Hammarskjöld to continue his good offices toward full compliance with the Israeli-Arab armistice.

Governments of the Malayan federation and Singapore announced that the British colonial office had authorized resumption of rubber exports in reasonable quantities to Communist China.

5 Pres. Eisenhower in a bipartisan meeting with congressional leaders warned that drastic cuts in foreign aid would be dangerous to national security.

Premier Nu of Burma resigned for a 1-yr. period in favour of Defense Minister Ba Swe in order to reorganize the ruling anti-fascist People's Freedom league.

West German Chancellor Adenauer and French Premier Mollet agreed on the political integration of the Saar into west Germany by Jan. 1, 1957.

6 International Bank for Reconstruction and Development announced a loan of \$16,500,000 to Colombia to complete a highway rehabilitation program.

7 Publication of the first Soviet statistical handbook since 1939 was disclosed.

Soviet Premier Bulganin in a letter to Pres. Eisenhower, called on the U.S. to match the announced Soviet reduction of 1,200,000 men in its armed forces.

West Germany agreed to contribute part of the cost of maintaining U.S. troops in west Germany for another fiscal year.

David Marshall, chief minister of Singapore, resigned in protest against British refusal to grant the colony's self-government demands.

8 Queen Elizabeth II of the U.K. and the duke of Edinburgh arrived in Stockholm on a state visit to Sweden.

9 Pres. Eisenhower's condition was termed excellent after an early morning operation for acute ileitis (inflammation of the lower portion of the small intestine).

10 Several rebels were summarily executed as Argentine navy and air force planes crushed an attempted Peronista counterrevolution.

11 U.S. supreme court held (6 to 3) that only those U.S. employees who held sensitive positions could be discharged as security risks.

Pres. Eisenhower rejected as impracticable an informal Soviet offer to invite all 4 members of the U.S. joint chiefs of staff to visit the U.S.S.R.

12 U.S. government rejected a Chinese Communist pro-

posal for an early meeting of their foreign ministers.

Committee of outstanding U.S. scientists reported that atomic radiation, no matter how small the amount, harms not only the person receiving it but also his descendants.

13 Britain's 74-yr. occupation of the Suez canal zone ended as the last token force of British troops sailed for Cyprus from Port Said.

West German Chancellor Adenauer and U.S. Secy. of State Dulles, after a meeting in Washington, D.C., issued a communiqué challenging the U.S.-S.R. to prove its professions of peaceful intention by agreeing to the reunification of Germany.

Judge Victor R. Hansen of the Los Angeles superior court was nominated to succeed Stanley N. Barnes as U.S. asst. atty. gen. in charge of the justice dept's. antitrust division.

Pres. Eisenhower signed a proclamation giving effect to tariff reductions negotiated by the U.S. at the 1956 meetings of the General Agreement on Tariffs and Trade, held at Geneva, Switz.

14 Britain and U.S. signed in Washington, D.C., a new agreement broadening the scope of atomic exchanges between them.

15 France and Tunisia signed in Paris an accord confirming Tunisia's independence in foreign affairs.

Soviet government was revealed to have recognized the independence of Morocco and Tunisia and to have offered to exchange diplomatic representatives.

Central committee of the Czechoslovak Communist party approved a number of changes in the composition of the Czechoslovak government.

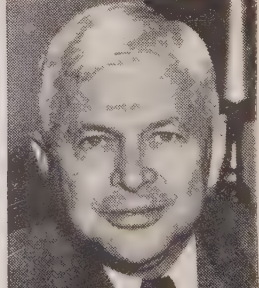
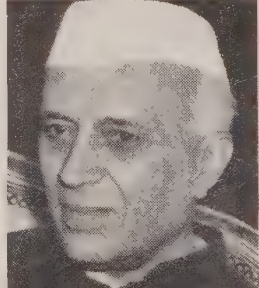
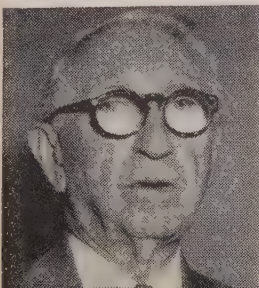
16 Soviet Foreign Minister Shepilov arrived in Cairo as the guest of Egyptian Premier Nasser.

6 employees of the U.S. consulate in Nicosia, Cyprus, were injured, 1 fatally, by terrorist bombs.

17 Golda Myerson (Meir), Israeli labour minister, replaced Moshe Sharett as foreign minister.

The pictures on this page are, left to right:

GEORGE.....	May 14
SEATON.....	May 28
SHEPILOV.....	June 1
NEHRU.....	June 3
WILSON.....	June 29



JUNE—Continued

Bolivian Vice-Pres. Hernán Siles Zuazo, candidate of the ruling National Revolutionary movement, was elected to succeed Víctor Paz Estenssoro as president in national elections.

18 International Cooperation administration announced that the U.S. government would help transport more than 1,000 Afghan Moslems on their pilgrimage to Mecca.

19 Egyptian Premier Nasser proclaimed the end of martial law and press censorship in effect since the overthrow of King Farouk in 1952.

France and U.S. signed in Washington, D.C., an agreement for co-operation in the peaceful uses of atomic energy.

20 Soviet Communist Party 1st Secy. Khrushchev and Yugoslav Pres. Tito signed in Moscow a joint declaration of renewed relations between Soviet and Yugoslav Communist parties.

21 Thailand officially lifted its ban on export of nonstrategic goods to Communist China and North Korea.

East German government asserted that it had released over 19,000 persons from prison following re-examination of their cases.

22 France and U.S. signed in Washington, D.C., a supplementary convention relating to the avoidance of double taxation.

Manuel Prado y Ugarteche (Conservative) was declared the winner of Peru's presidential elections, held on June 16.

23 Egyptian voters ratified the selection of Premier Nasser as president and also confirmed the new constitution drafted by the military junta.

U.S. International Cooperation administration announced that it would provide \$3,670,000 for highway and airport development in Lebanon.

24 Military junta which had ruled Egypt since 1952 was dissolved.

Guatemalan government suspended 13 constitutional rights for 30 days because of an alleged Communist plot to create disturbances.

Headquarters of the Southeast Asia Treaty organization were formally opened in Bangkok, Thai.

25 Shah Riza Pahlavi of Iran arrived in Moscow on an official visit.

International Air Transport assn. formally approved, subject

to government authorization, the institution of 15-day excursions and 3rd-class service across the Atlantic at new low rates.

Yugoslav Pres. Tito and Rumanian leaders signed in Bucharest joint declarations of renewed relations between the Yugoslav and Rumanian governments and Communist parties.

Honduras and U.S. signed in Washington, D.C., a treaty for avoidance of double taxation and prevention of fiscal evasion with respect to taxes on income.

Britain and U.S. signed in Washington, D.C., 2 agreements extending the Anglo-U.S. guided-missile range in the Caribbean to St. Lucia in the Windward Is. and Ascension I. in the South Atlantic.

26 UN Security council declined (7 to 2) to debate the situation in Algeria.

International Bank for Reconstruction and Development announced a loan of \$75,000,000 to Tata Iron and Steel Co. of India to help finance the purchase abroad of equipment for expansion.

27 Pakistan and U.S.S.R. signed in Karachi their first bilateral trade agreement.

U.S. Secy. of State Dulles told his press conference that Soviet attack on Stalin had shaken Soviet control over satellite and western Communist movements.

28 Tanks were used to combat violent rioting which swept the city of Poznan, Pol.

Chou En-lai, Chinese Communist premier, formally offered to negotiate with the Chinese Nationalists on steps and conditions for the "peaceful liberation" of Formosa.

7th postwar conference of the prime ministers of the commonwealth of nations met in London under the chairmanship of British Prime Minister Eden.

Poland and U.S. signed in Washington, D.C., an agreement for the payment of Poland's World War II lend-lease account.

29 U.S. Defense Secy. Wilson in testimony before a senate subcommittee denied charges that the administration had reduced military spending to balance the budget.

Program for increased exchanges of information and persons between the U.S. and the Soviet bloc in Europe was approved by Pres. Eisenhower.

Portuguese defense ministry announced that Portugal had placed at the disposal of NATO 2 strategically important air bases at Montijo and Espinho on the Portuguese mainland.

Pres. Eisenhower approved a bill authorizing \$33,480,000,000 for U.S. highway construction to be supported by federal contributions from increased highway use taxes.

30 United Steelworkers of America went on strike at midnight against U.S. steel companies following the failure of negotiations for a new contract.

Pres. Eisenhower left Walter Reed hospital in Washington, D.C., and was driven to his farm near Gettysburg, Pa.

2 U.S. air liners carrying 128 persons collided and crashed over the Grand canyon area in the worst disaster in the history of commercial aviation.

Text of the long-suppressed testament of Nicolai Lenin in which he proposed the removal of Stalin as gen. secy. of the Soviet Communist party was released in Moscow.

JULY

1 East German government announced its decision to reduce the strength of its army from 120,000 to 90,000 men.

2 Central committee of the Soviet Communist party issued a declaration criticizing Communists abroad who questioned its attacks on Stalin.

Ceylonese Prime Minister Bandaranaike announced in London that the British government had agreed in principle to the evacuation of British bases in Ceylon.

U.S. state dept. denounced as wholly false Soviet charges that the U.S. had financed riots at Poznan, Pol.

Soviet government announced its decision to recognize the kingdom of Laos and to establish diplomatic relations.

3 U.S. Vice-Pres. Nixon announced on his arrival in Manila recognition by the U.S. of full Philippine sovereignty over U.S. military bases in the Philippines.

U.S. Senate passed by voice vote and sent to the White House a bill authorizing a temporary increase of \$3,000,000,000 in the public debt for the 1957 fiscal year.

Pres. Eisenhower approved a bill authorizing payment of \$964,199.35 to the Vatican as damages for the accidental bombing by U.S. aircraft of the summer residence of Pope Pius XII during World War II.

4 U.S. Atty. Gen. Brownell announced on a TV program that the justice dept. would bring an antitrust action against General Motors Corp. charging it

with monopolizing the manufacture of buses.

Pierre Poujade and 6 other leaders of the French Poujadist party were fined by a Paris court on charges of inciting persons to refuse to pay taxes or to delay payment.

5 Abdullah Khalil, Umma party leader, was named to succeed Ismail el-Azhari as premier of Sudan.

U.S. house of representatives rejected (224 to 194) a controversial bill to provide \$1,600,000,000 in aid for school construction.

Nepalese government announced that a plot to overthrow it had been foiled.

6 Soviet Communist party newspaper *Pravda* rejected as contrary to Leninist ideology any action to form opposition parties or political groups in the U.S.S.R.

U.S. state dept. announced the entering into force of an international agreement regarding financial support of the North Atlantic ice patrol.

U.S. navy dept. designated Capt. Finn Ronne to command a U.S. antarctic base to be built late in 1956 at the southwest corner of the Weddell sea.

7 Bill was enacted declaring Sinhalese to be the sole official language of Ceylon.

U.S. Vice-Pres. Nixon delivered to Generalissimo Chiang Kai-shek a letter from Pres. Eisenhower reiterating U.S. support of Nationalist China.

Soviet leaders announced new measures to strengthen the Communist ideological background of older students.

9 U.S. congress passed and sent to the White House a compromise bill authorizing the appropriation of \$4,014,575,000 for foreign economic and military aid for the 1957 fiscal year.

10 Pres. Eisenhower reiterated his decision to seek re-election to a 2nd term.

Soviet government charged that U.S. aircraft had recently violated Soviet air space by flights as deep as 200 mi. within Soviet borders.

British house of lords rejected (238 to 95) a bill approved by the house of commons to abolish the death penalty.

Clarence B. Randall was appointed special assistant to Pres. Eisenhower on foreign economic policy and chairman of the Foreign Economic Policy council.

11 Pres. Eisenhower reported to congress that nearly \$3,-

JULY—Continued

000,000,000 worth of U.S.-owned surplus farm products had been disposed of, mostly by export, since 1954.

12 Egyptian Pres. Nasser arrived in Belgrade on a state visit to Yugoslavia.

Moscow radio announced that the U.S.S.R. and 10 other Communist nations had signed a formal agreement for the creation of a joint institute for theoretical and experimental research in nuclear physics.

13 U.S. government informed the UN Disarmament commission that it would continue nuclear weapons tests until an international agreement had been reached to limit or eliminate such weapons.

14 Pres. Eisenhower's physicians reported that his recovery from surgery had gained momentum and that he was steadily regaining his strength.

16 Pres. Eisenhower vetoed a bill authorizing \$2,136,400,000 for military public works on the grounds that 2 of its provisions constituted a congressional invasion of executive authority.

King Faisal II of Iraq arrived in London on a state visit.

U.S. government charged the U.S.S.R. with holding at least 10 crew members from 2 downed U.S. military aircraft.

Orville E. Hodge, Illinois auditor of public accounts, resigned during an investigation into the issuance, endorsement and negotiation by persons connected with his office of checks totalling \$536,226.

17 Soviet and east German governments issued a communiqué reiterating that reunification of Germany was impossible without direct negotiations between east and west German governments.

18 U.S. defense dept. announced that the U.S. far east command with headquarters in Tokyo would be abolished July 1, 1957.

Pres. Eisenhower approved a bill authorizing the death penalty upon conviction of selling or giving heroin to persons under 18.

American Telephone and Telegraph Co. announced plans to offer 5,750,000 shares of common stock to its shareholders, the largest common stock offering in history.

Indian Prime Minister Nehru, Egyptian Pres. Nasser and Yugoslav Pres. Tito met for a conference on islands off the Yugoslav coast.

19 U.S. budget surplus of \$1,754,000,000 (the 4th surplus since 1930) was reported for the 1956 fiscal year.

British government announced the appointment of Sir Harold Caccia, deputy undersecy. for foreign affairs, to succeed Sir Roger Makins as British ambassador to the U.S.

U.S. government withdrew its offer to assist Egypt in the construction of the Aswan high dam on the Nile.

U.S. Atomic Energy commission announced that recent tests had proved that the fall-out hazard from nuclear explosions could be minimized.

20 UN Security council voted unanimously to recommend the admission of Morocco to the UN.

British government withdrew its offer to help Egypt construct the proposed Aswan high dam.

West German upper house gave final approval (21 to 17) to Germany's first post-World War II military conscription law.

21 Soviet Foreign Minister Shepilov indicated that the Soviet government was not considering aid to Egypt in the construction of the proposed Aswan high dam.

John W. Gwynne, chairman of the Federal Trade commission, announced the initiation of a drive against illegal discrimination in prices and services by large food stores and their suppliers.

22 Pres. Eisenhower and the chiefs of state and presidents-elect of 18 Latin-American republics signed a declaration at Panamá setting forth the political, economic and philosophical principles subscribed to by them.

23 U.S. Securities and Exchange commission adopted a revised regulation tightening the rules applicable to small stock offerings.

Harold E. Stassen, presidential assistant, named Gov. Christian A. Herter (R., Mass.) as a stronger Republican vice-presidential nominee than Vice-Pres. Nixon.

U.S. Atomic Energy commission and the defense dept. announced the successful conclusion of a series of nuclear weapons tests at U.S. proving grounds in the western Pacific.

24 New coalition Icelandic cabinet with 2 Communist members and headed by Hermann Jonasson replaced that of Olafur Thors.

U.S. house of representatives rejected (155 to 135) an administration-opposed bill to direct the U.S. Atomic Energy com-

mission to initiate a \$400,000,000 program for the construction of atomic power reactors.

25 International Bank for Reconstruction and Development announced the formation of the International Finance Corp. and the election of Robert L. Garner of the U.S. as its first president.

Czechoslovak government disclosed that the strength of the Czechoslovak armed forces would be further reduced by 10,000 men.

26 Egyptian government seized the Suez canal and nationalized the Suez Canal Co.

Italian liner "Andrea Doria" sank off Nantucket Island after being rammed July 25 by the Swedish liner "Stockholm."

UN Security council voted unanimously to recommend Tunisia for membership in the UN.

UN Secy. Gen. Hammarskjöld issued an appeal to Israel and the Arab nations to enforce cease-fire promises.

U.S. congress passed and sent to the White House a bill increasing the salaries of cabinet members from \$22,500 to \$25,000 and authorizing increases for other high-ranking federal employees.

27 Memorandum of agreement on terms for ending the strike of United Steelworkers of America against U.S. steel companies was signed in New York, N.Y.

Ecuador's supreme electoral tribunal announced that Camilo Ponce Enriquez had been elected president in elections, June 3, 1956.

U.S. congress passed and sent to the White House a bill providing for an experimental U.S. flood insurance program.

28 British treasury blocked all Egyptian accounts in the U.K. in retaliation for Egyptian action concerning the Suez canal.

2nd session of the 84th U.S. congress adjourned *sine die*, with the senate following the house of representatives into adjournment shortly after midnight.

Peru's newly elected congress legalized the Apra party after an 8-yr. outlawry.

29 British Foreign Secy. Lloyd, French Foreign Minister Pineau and Robert Murphy, U.S. deputy undersecy. of state, began talks in London concerning the Egyptian seizure of the Suez canal.

30 International Cooperation administration announced that 20,000 tons of U.S. surplus wheat would be sent to

Iran to aid victims of severe floods.

British Prime Minister Eden told the house of commons that Britain could not accept unrestricted control of the Suez canal by a single power.

31 Burmese government reported that Communist Chinese frontier troops had occupied a section of northeast Burma.

U.S. Sen. Estes Kefauver (D., Tenn.) withdrew from the race for the Democratic presidential nomination and urged the nomination of Adlai E. Stevenson.

AUGUST

1 Pres. Eisenhower signed the Social Security amendments of 1956 establishing a system of disability insurance and making women eligible for social security benefits at age 62 instead of 65.

Honduran government forces were reported to have suppressed a small-scale army rebellion at Tegucigalpa, the capital.

Czechoslovak national assembly passed a bill extending the powers of the Slovak national council.

2 Bolivia and Japan signed in La Paz an agreement on the immigration of Japanese citizens into Bolivia.

British, French and U.S. governments called for a 24-nation conference in London to consider creation of an international body to control the Suez canal.

Albert Woolson, 109, last surviving member of the Union army in the Civil War, died in Duluth, Minn.

British parliament bill providing for establishment of a British Caribbean federation was enacted following its unopposed passage by both houses.

3 Pres. Eisenhower appointed Leroy E. Burney as surgeon general of the U.S. public health service.

U.S. treasury dept. authorized U.S. shipowners to pay tolls to the new Egyptian Suez canal authority, provided payment was made under protest.

Gold Coast's newly elected legislative assembly unanimously adopted a resolution (boycotted by opposition members) calling for its independence within the British commonwealth.

4 Indonesia repudiated its debts to the Netherlands, reportedly in excess of \$1,000,000,000.

Indian Atomic Energy commission announced the commencement of operation of In-

AUGUST—Continued

dia's first atomic reactor at Trombay, near Bombay.

5 Egyptian government recalled an unspecified number of army reservists to active duty.

Warsaw radio announced that the Polish United Workers' (Communist) party had rehabilitated and readmitted to membership Wladyslaw Gomulka, its former sec. general.

United Steelworkers of America and 12 major U.S. steel companies signed 3-yr. contracts carrying out their memorandum of agreement and effectively settling a 36-day strike.

6 Pres. Eisenhower signed a bill permitting the Federal Bureau of Investigation to begin investigation of kidnapping cases after the expiration of 24 hr. instead of 7 days.

Communist China lifted its ban on visits by U.S. news correspondents, but the U.S. state dept. said its policy of forbidding the use of U.S. passports for travel in Communist China would not be changed.

Jordan and Syria signed an agreement in Damascus providing for the formation of a customs and economic union.

7 Pres. Iskander Mirza of Pakistan arrived in Kabul on a state visit to Afghanistan.

White House made public a letter from Pres. Eisenhower to Soviet Premier Bulganin which made apparent an impasse in direct disarmament negotiations between them.

J. Lee Rankin, chief of the justice dept.'s legal counsel office, was nominated by Pres. Eisenhower to succeed Simon E. Sobeloff as U.S. solicitor general.

8 Canada and U.S. signed in Ottawa a supplementary convention for the avoidance of double income taxation designed primarily to encourage wider Canadian participation in ownership of Canadian subsidiaries of U.S. corporations.

British Prime Minister Eden in a radio-TV address stated that Egyptian Pres. Nasser was Britain's only enemy in the Suez canal crisis.

9 Egyptian Pres. Nasser proclaimed the formation of a

new national liberation army.

3 convicted Greek Cypriots were hanged by British authorities in Nicosia, Cyprus.

Soviet government accepted with reservations an invitation to the London conference on the status of the Suez canal.

10 Six eastern U.S. railroads petitioned the Interstate Commerce commission for a 45% increase in 1st-class passenger fares and a 5% increase in coach fares.

Pres. Eisenhower completed action on bills passed by the 2nd session of the 84th U.S. congress by vetoing a \$1,600,000,000 rivers and harbours authorization bill.

11 Soviet government announced plans to develop through irrigation a vast new cotton-producing region on the steppes of Uzbekistan and Kazakhstan.

12 Egypt rejected an invitation to the London conference on the status of the Suez canal.

Britain initiated a major airlift of troops to the middle east.

Pres. Eisenhower met at the White House with congressional leaders of both parties to review the Suez canal situation.

13 West German Red Cross announced that up to 160,000 Czechoslovak citizens of German descent had been granted freedom to emigrate to west Germany.

U.S. commerce dept. reported that the U.S. gross national product had reached the record annual rate of \$408,000,000,000 in the 2nd quarter of 1956.

U.S. Defense Secy. Wilson set up a special committee headed by Charles A. Coolidge of Boston, Mass., to determine how to halt leaks of secret military documents.

14 Soviet government denied that any U.S. air force or naval aviation personnel were being held in Soviet territory.

Jacques Georges-Picot, director general of the Suez Canal Co., announced that most of its non-Egyptian employees had remained loyal to the company and refused to work for the new Egyptian canal authority.

Bey of Tunis sealed a number

of decrees affecting the status of Tunisian women, including one providing for the prospective abolition of polygamy.

U.S. office of defense mobilization announced the formation of a middle east emergency committee composed of U.S. oil companies engaged in foreign petroleum operations.

15 U.S. government announced in Geneva, Switz., that it regarded as ineffectual, and would not adhere to, a proposed new international convention to outlaw certain indirect forms of slavery, such as debt bondage.

16 Adlai E. Stevenson of Illinois was renamed the Democratic presidential nominee on the first ballot at convention at Chicago; Gov. W. Averell Harriman of New York ran second.

Conference on the status of the Suez canal opened in London with representatives of 22 nations in attendance.

Cypriot terrorist organization (EOKA) announced the suspension of its campaign of violence in order to facilitate a settlement of the dispute with British authorities.

17 U.S. Sen. Estes Kefauver (D., Tenn.) was named the Democratic vice-presidential nominee on the 2nd ballot at convention at Chicago.

UN Truce Supervisory organization reported that 9 Egyptian soldiers had been killed in 2 incidents near the Israeli border in the Gaza area.

West German constitutional court outlawed the west German Communist party and its numerous front organizations.

19 Venezuelan government published decrees granting the first new petroleum concessions since 1945.

20 Malayan Federation government stated in its annual report that Communist terrorists in Malaya had been reduced to more of an annoyance than a threat.

U.S. commerce dept. estimated that U.S. investments abroad totalled \$29,000,000,000 in 1955, an increase of \$2,400,000,000 over 1954.

21 British colonial office announced that Britain would give £500,000 (\$1,400,000) to

Malta to cover urgent financial needs.

22 Pres. Eisenhower and Vice-Pres. Nixon were unanimously renamed the Republican presidential and vice-presidential nominees at convention at San Francisco.

U.S. navy dept. reported that a U.S. navy patrol plane was missing after being attacked by aircraft off the coast of Communist China.

British government offered terrorists on the island of Cyprus 3 weeks in which to surrender with their arms.

23 Federal Reserve board authorized an increase from 2½% to 3% in the discount rate to be charged to banks by Federal Reserve banks in 4 areas, including New York.

18 nations agreed at the London conference to ask Egypt to enter into negotiations with a 5-power committee for international operation of the Suez canal.

25 Afghanistan was reported to have signed agreements with the U.S.S.R. and Czechoslovakia providing for shipment of arms, ammunition and aircraft to Afghanistan.

26 White House announced the explosion of a nuclear weapon in Soviet central Asia by the U.S.S.R. 2 days earlier.

British government charged that exiled Archbishop Makarios had personally directed terrorist activities on Cyprus.

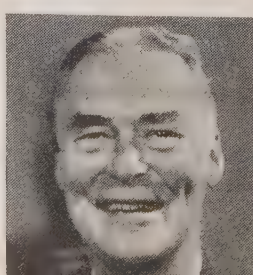
27 International Cooperation administration stopped the initiation of new aid projects in Egypt.

28 British treasury announced final approval of the proposed purchase of Trinidad Oil Co. by Texas Co. of the U.S.

Egyptian Pres. Nasser agreed to discuss settlement of the Suez canal dispute with a 5-power committee headed by Australian Prime Minister Robert G. Menzies.

The pictures on this page are, left to right:

RANDALL.....July 10
FAISAL.....July 16
HERTER.....July 23
BURNEY.....Aug. 3
GOMULKA.....Aug. 5



AUGUST—Continued

29 Demonstrations against admission of Negro students to previously all-white high schools broke out in Clinton, Tenn. and Mansfield, Tex.

British foreign office announced that France had been granted permission to station troops temporarily on Cyprus.

India and U.S. signed in New Delhi an agreement providing for the delivery to India of \$305,900,000 worth of U.S. agricultural surpluses plus the advancing by the U.S. of \$54,200,000 toward transportation expenses.

30 Cypriot terrorists resumed their activities on the island of Cyprus with the mining of a British landing craft at Famagusta.

31 Soviet track team cancelled a meet in London with a British team because of the arrest by British police of a Soviet woman athlete on a shoplifting charge.

Brazilian government suspended export to the U.S. of minerals used for nuclear energy and denounced a Brazilian-U.S. agreement for a joint search for uranium in Brazil.

Pres. Eisenhower announced at his press conference the detonation by the U.S.S.R. of a 2nd nuclear device; the report was later confirmed by a Soviet announcement.

SEPTEMBER

Pres. Eisenhower issued an executive order designating the World Meteorological organization a public international organization with attendant privileges, exemptions and immunities under U.S. law.

Ceylon and U.S.S.R., following a conference in Moscow, announced that they had agreed on plans for economic co-operation and the exchange of diplomatic representatives.

2 James Mitchell, U.S. labour secy., reported that U.S.

employment in Aug. 1956 was at the all-time high of 66,800,000.

National guardsmen took over law enforcement in Clinton, Tenn., following school integration riots.

3 U.S. Atomic Energy commission announced the explosion of a 3rd atomic weapon by the U.S.S.R. in its most recent series of tests.

UN Food and Agriculture organization reported that world agricultural production had risen by 3% in 1955-56.

Robert G. Menzies, Australian prime minister, presented to Egyptian Pres. Nasser an 18-nation plan for international control of the Suez canal.

4 U.S. Civil Aeronautics administration announced plans for establishing an office of air traffic control responsible for safer direction of planes in crowded airways.

Pres. Eisenhower formally offered to Democratic presidential nominee Stevenson periodic briefings by the Central Intelligence agency on international developments.

5 Benjamin F. Fairless was named by Pres. Eisenhower as chairman of a citizens' committee to review foreign aid developments.

Pres. Eisenhower stated at a press conference that he would oppose U.S. intervention in southern school disputes unless the states were unwilling or unable to resist mob violence.

6 Jordanian government awarded a contract to a west German firm for the construction of a port at 'Aqaba at the head of the gulf of 'Aqaba.

National guardsmen with fixed bayonets opened the way for Negro students seeking to attend an integrated high school in Sturgis, Ky.

7 Sherman Minton, associate justice, announced his retirement from the U.S. supreme court, effective Oct. 15.

West Germany called upon the U.S.S.R. to resume energetically efforts to advance reunification of the German people.

Mexico initiated a 5-yr. campaign for the eradication of malaria.

8 Soviet government announced that the Soviet's first minimum wage law would go into effect on Jan. 1, 1957.

9 Atomic laboratory at Los Alamos, N.M., disclosed that for a year it had been working on nuclear-powered rockets.

Negotiations with Egypt over the control of the Suez canal by committee headed by Australian Prime Minister Menzies were revealed to have ended in failure.

10 U.S. Export-Import bank announced a plan of accelerated assistance in financing exports of surplus U.S. farm commodities on a short-term basis.

Tass, Soviet news agency, announced the carrying out of another Soviet atomic weapons test and confirmed a previous test earlier in the month.

Egypt proposed the establishment of a special negotiating body composed of all nations using the Suez canal to work out a settlement of the canal dispute.

H. S. Suhrawardy, leader of the People's league, was named prime minister of Pakistan to succeed Mohammed Ali.

11 British Prime Minister Eden and French Premier Mollet agreed upon a harsh economic campaign to force Egypt to agree to international control of the Suez canal.

12 Jordan claimed that Israeli forces had wiped out a Jordanian police post in the Hebron area.

Pres. Sukarno of Indonesia arrived in Belgrade on a state visit to Yugoslavia.

13 UN Secy. Gen. Hammarskjöld called upon middle east countries to honour their obligations under the Palestine armistice agreements.

14 Egypt took over full control of the Suez canal with almost entirely Egyptian personnel after most foreign employees quit their jobs.

White House announced that Soviet Premier Bulganin in another letter to Pres. Eisenhower had proposed new negotiations to deal with concrete rather than general questions on disarmament.

UN Secy. Gen. Hammarskjöld warned Israel and Jordan

against further outbreaks along their frontier in disregard to UN appeals.

University of California announced the discovery of the antineutron, a new and previously unknown particle, with the property of destroying matter in its ordinary state.

15 Soviet government denounced the Suez Canal Users' assn. proposed by the U.K., France and the U.S.

Indonesia and U.S.S.R. signed in Jakarta an agreement providing for Soviet credits of \$100,000,000 in the form of capital goods, machinery and heavy industrial equipment.

8th national congress of the Chinese Communist party (the first since 1945) met in Peking.

16 U.S. Export-Import bank in its annual report revealed that in the 1956 fiscal year, it had granted 156 loans totalling \$375,900,000 to finance exports of U.S. equipment, commodities and services.

17 Inter-American committee of presidential representatives held its 1st meeting in Washington, D.C., with Milton S. Eisenhower representing Pres. Eisenhower.

U.S. Export-Import bank announced its readiness to extend credits up to \$100,000,000 to Argentina for economic recovery.

18 Poland and U.S.S.R. signed in Moscow an agreement providing for large-scale Soviet aid to Polish economy.

British government announced that, subject to parliamentary approval, the Gold Coast would be granted independence within the commonwealth of nations on March 6, 1957.

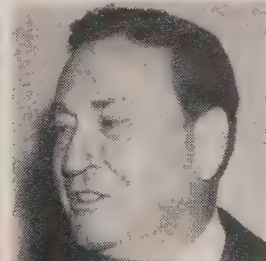
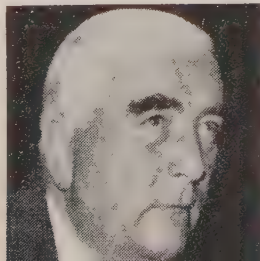
International Bank for Reconstruction and Development made public a loan of \$3,000,000 to the Central Bank of Costa Rica to provide for development of agriculture and light industry.

19 2nd conference on control of the Suez canal opened in London, with representatives of 18 nations in attendance.

International Cooperation administration announced a gift by the U.S. to Tunisia of up to 45,000 tons of wheat to avert a threatening food shortage.

The pictures on this page are, left to right:

MAKARIOS	Aug. 26
MENZIES	Sept. 3
FAIRLESS	Sept. 5
EISENHOWER	Sept. 17
BRENNAN	Sept. 29



SEPTEMBER—Continued

Executive board of the International Monetary fund announced the appointment of Per Jacobsson of Sweden as managing director and board chairman.

20 Argentina became a member of the International Monetary fund and the International Bank for Reconstruction and Development.

White House announced 4 actions to increase availability of mortgage money for housing construction.

Binay Ranjan Sen, Indian ambassador to Japan, was elected director general of the UN Food and Agriculture organization to succeed Philip V. Cardon of the U.S.

International Bank for Reconstruction and Development announced 2 loans totaling \$31,000,000 for electrical power expansion to 2 Austrian concerns in conjunction with an Austrian government-owned agency.

21 3 Greek Cypriot rebels were hanged by British authorities in Cyprus after conviction on charges of violence and murder.

Canadian government announced that it would sell 24 jet fighter planes to Israel.

Draft plan for a Suez Canal Users' assn. which would not bind its members to drastic action was approved at London conference.

South Vietnam became a member of the International Monetary fund and the International Bank for Reconstruction and Development.

George Drew, leader of the Canadian Progressive Conservative party, resigned because of ill health.

22 Princess Margaret of the U.K. arrived in Kenya on a 5-week official visit to British territories in the Indian ocean and east Africa.

U.S. Communists issued a statement confessing past errors and proposing to reform their party.

23 Bolivian government declared a state of siege to quell hunger riots.

British and French governments requested a meeting of the UN Security council to consider the Suez canal situation.

24 Egypt, Saudi Arabia and Syria issued a joint communiqué demanding that the western powers negotiate with Egypt on the Suez canal without pressure.

Belgium and west Germany signed in Brussels an agreement providing for the return to German sovereignty of border areas placed under Belgium military administration in 1949.

U.S. Atomic Energy commission and the state dept. announced the signing of an agreement by the U.S., the U.K. and Canada as to disposition of rights in atomic energy inventions.

25 First telephone cable between North America and Europe was opened with ceremonies in New York, London and Ottawa.

26 Israeli troops were reported to have killed over 50 Jordanians in reprisal attacks on Jordanian army and police posts.

UN Security council voted to consider the Anglo-French complaint against Egypt's nationalization of the Suez canal and also Egypt's countercomplaint.

British government announced its decision to permit Seretse Khama, former chief-designate of the Bamangwato tribe, to return to Bechuanaland as a private citizen.

27 Yugoslav Pres. Tito and Soviet Communist Party 1st Secy. Khrushchev left Belgrade together by air for discussions in the U.S.S.R.

Bolivian plane carrying 47 political prisoners was seized by them and flown to Salta, Arg., where they received political asylum.

Medical authorities in New York city declared after examinations that Javier Pereira, Colombian Indian who claimed to be 167 yr. old, might be more than 150.

First of a new test series of British atomic devices was held at the Maralinga proving ground in the south Australian desert.

28 North Atlantic council issued a communiqué expressing concern over west Germany's decision to reduce from 18 months to 1 yr. the period of military service for conscripts.

Indian Prime Minister Nehru and King Saud of Saudi Arabia ended a 3-day conference in Saudi Arabia with a joint communiqué urging a negotiated settlement of the Suez canal dispute.

29 U.S.S. "Ranger," 3rd U.S. super aircraft carrier, was launched at Newport News, Va.

Soviet government accepted a U.S. invitation to send representatives to observe the 1956 presidential elections.

Luis A. Somoza was elected president of Nicaragua to suc-

ceed his father, Gen. Anastasio Somoza, who died in Panamá of wounds inflicted by an assassin.

Pres. Eisenhower announced the selection of William J. Brennan, Jr., associate justice of the N.J. supreme court, to succeed Sherman Minton as an associate justice of the U.S. supreme court.

West German Chancellor Adenauer and French Premier Mollet concluded in Bonn an agreement for the return of the Saar to west Germany.

30 Pres. Sukarno of Indonesia arrived in Peking on a state visit to Communist China.

OCTOBER

Suez Canal Users assn. was formally inaugurated in London with a membership of 15 nations, including France, the U.K. and the U.S.

National Foundation for Infantile Paralysis announced a campaign to vaccinate everyone, at least through the age of 35, with Salk antipolio vaccine.

2 Italy and Libya signed in Rome an agreement settling a number of problems outstanding since the end of World War II.

Pres. Eisenhower issued an executive order designating the International Finance Corp. as a public international organization with attendant privileges, exemptions and immunities under U.S. law.

3 Israel announced its intention to boycott future meetings of the Israeli-Jordanian Mixed Armistice commission.

Argentina and U.S. signed in Buenos Aires an agreement providing for the assignment to Argentina of a U.S. air force mission.

4 Suez Canal Users assn. adopted resolutions detailing agreements on finance and organization.

Israeli-Jordanian Mixed Armistice commission voted to censure Israel for planned and unprovoked aggression in a raid on Husan, Jordan, in Sept. 1956.

United Mine Workers of America and Bituminous Coal Operators assn. signed a contract providing for an increase in wages and fringe benefits totaling 30 cents an hour for bituminous coal miners.

5 UN Security council opened debate on the Anglo-French complaint concerning Egyptian nationalization of the Suez canal.

6 Albert B. Sabin of the University of Cincinnati (O.) announced that he had developed

an antipolio vaccine to be taken orally.

7 Moroccan foreign ministry announced the renunciation by the U.S. of its extraterritorial treaty rights in Morocco.

U.S. Atty. Gen. Brownell in a memorandum to Pres. Eisenhower stated that the communist threat in the U.S. could be met within the framework of the constitution and judicial processes.

British government was reported to have asked the U.S. to bar its ships from paying tolls to the Egyptian-controlled Suez canal authority.

8 Don Larsen, of the New York Yankees baseball team, in the 5th game of the 1956 world series pitched the first perfect major league baseball game in 34 yr. and the first no-hit game in world series history.

9 U.S. government reported that trade between the communist bloc and the rest of the world increased by 24% in 1955.

10 British colony of Hong Kong was swept by severe rioting and looting.

New York Yankees baseball team defeated the Brooklyn Dodgers, 9 to 0, in the 7th game to win the 1956 world series.

U.S., Britain and France in notes delivered to the Soviet government urged resumption of negotiations on the reunification of Germany.

11 International Bank for Reconstruction and Development announced a loan equivalent to \$74,628,000 to an Italian government agency for agricultural and industrial development of southern Italy.

Pres. Eisenhower announced new steps to help ease acute distress in U.S. drought areas.

UN Truce Supervisory organization reported that 66 persons had been killed in an Israeli reprisal raid into Jordanian territory.

12 Pres. Eisenhower named Bertram D. Tallamy of New York to the new post of federal highway administrator.

British, Egyptian and French foreign ministers agreed in New York city, upon 6 general principles to govern operation of the Suez canal but remained deadlocked on the question of control.

Arthur S. Flemming, U.S. defense mobilizer, was authorized by Pres. Eisenhower to begin a study of U.S. oil tanker requirements.

British government warned Israel that Britain was prepared to fulfill obligations for the de-

OCTOBER—Continued

fense of Jordan under the Anglo-Jordanian treaty of 1948.

Netherlands' parliament resolved the longest crisis in its history with the re-appointment of Willem Drees as premier to head a coalition government.

13 U.S.S.R. cast its 78th veto in the UN Security council to bar a key section of an Anglo-French resolution in the Suez canal crisis.

14 Pope Pius XII in a radio address deplored employment of women in industrial and heavy labour.

15 Burma and Thailand signed in Bangkok a treaty of peace and friendship.

Pres. Eisenhower conditionally authorized the continuance of U.S. economic aid to Yugoslavia but withheld heavy military equipment until the situation could be more accurately appraised.

U.S. Atomic Energy commission and the commerce dept. were directed by Pres. Eisenhower to proceed with the design and construction of the first U.S. atomic-powered merchant ship.

Jordan requested the UN Security council to meet as soon as possible to consider new acts of aggression by Israel against Jordan.

16 Grand Army of the Republic officially went out of existence with the signing of a U.S. federal court order turning over the remainder of its property to the Smithsonian institution.

17 Queen Elizabeth II opened the world's first full-scale nuclear power station at Calder Hall, Eng.

France and Britain in a joint communiqué stated that they were ready to consider together any new Egyptian proposals for settlement of the Suez canal dispute.

18 International Monetary fund approved a stand-by arrangement granting France the right to purchase for francs up to \$262,500,000 from the fund in the next 12 months.

1956 Nobel prize for medicine was awarded to Dickinson W. Richards and André F. Cournand of Columbia university and Werner Forssmann (west Germany) for their work in cardiology.

Antony Head, secy. for war, was named to succeed Sir Walter Monckton as minister of defense in the British cabinet.

19 Eyvind Bartels, Danish consul general in New York,

was appointed administrator of the Suez Canal Users assn.

Japan and U.S.S.R. signed in Moscow a joint declaration ending the state of war between them and re-establishing diplomatic relations.

20 Pres. Eisenhower in a letter to former Pres. Herbert Hoover stated that satisfactory progress had been made in carrying out recommendations of the Hoover commission on the organization of the executive branch of the government but that much remained to be done.

21 Julio Lozano Díaz was forced by a military junta to resign as Honduran chief of state.

Wladyslaw Gomulka was elected to replace Edward Ochab as 1st secy. of the Polish Communist party; former Soviet Marshal K. K. Rokossovsky failed to secure re-election to the Politburo.

Pres. Eisenhower in a letter to Soviet Premier Bulganin angrily denounced as interference in U.S. politics the latter's note to him suggesting that they negotiate an agreement to end atomic weapons tests.

British admiralty announced the promotion to the rank of admiral of the fleet of Earl Mountbatten of Burma, first sea lord and chief of naval staff.

22 Soviet army units were reported to have begun new manoeuvres in Poland.

French authorities seized 5 chief Algerian rebel leaders after ordering diversion to Algiers airport of the plane in which they were flying from Morocco to Tunisia.

23 Hungarian police fired upon a Budapest crowd demonstrating against the Hungarian government and the presence of Soviet troops in Hungary.

Representatives of 82 nations voted unanimously to establish an international agency to promote the peaceful use of atomic energy throughout the world.

White House released to the press a statement by Pres. Eisenhower and 2 related memoranda detailing U.S. policies and actions in the development and testing of nuclear weapons.

24 Indian government announced that the Gregorian calendar would be adopted for all official purposes effective March 22, 1957.

Soviet forces were reported to have quelled anti-Soviet rioting in Budapest as Imre Nagy replaced Andras Hegedus as Hungarian premier.

25 Austria and U.S. signed in Washington, D.C., a con-

vention for the avoidance of double taxation with respect to taxes on income.

Erno Gero was replaced by Janos Kadar as 1st secy. of the Hungarian Communist party amid continued demonstrations.

Egypt, Jordan and Syria signed an agreement placing their armies under a joint command headed by Maj. Gen. Abdel Hakim Amer of Egypt.

Juan Ramón Jiménez, Spanish-born poet residing in Puerto Rico, was awarded the 1956 Nobel prize for literature.

International Bank for Reconstruction and Development announced a loan of \$25,500,000 to an autonomous Uruguayan government agency for electric power development.

26 South Vietnam promulgated a new republican constitution giving broad powers to its president.

Pres. Eisenhower promised to make available 11,000 lb. of uranium 235 to the newly established International Atomic Energy agency.

27 Hungarian cabinet was broadened by the addition of 2 leaders of the outlawed Smallholders' party.

28 Pres. Eisenhower's physicians reported after a thorough examination that he was in excellent health.

UN Security council voted 9 to 1 (U.S.S.R.) to put on its agenda consideration of the situation in Hungary.

Israeli government announced that army reserves had been mobilized and stationed along the borders of neighbouring Arab states.

Stefan Cardinal Wyszynski, Roman Catholic primate of Poland, was released by the Polish government.

Eric Williams, leader of the People's National movement, formed a new government in Trinidad.

29 Israeli forces invaded Egyptian territory in the Sinai peninsula and were reported to have moved to within 25 mi. of the Suez canal.

Declaration abrogating the international status of Tangier was signed there by representatives of Morocco and the 8 nations comprising the International Control commission for Tangier.

30 Soviet government announced its willingness to examine the question of the stationing of Soviet troops in satellite countries.

Anglo-French ultimatum, rejected by Egypt and conditionally accepted by Israel, stated that unless Egypt and Israel ceased hostilities in the Sinai peninsula Britain and France would seize the Suez canal.

Britain and France vetoed 2 UN Security council resolutions with regard to the invasion of Egypt.

Italy and U.S. signed in Rome an agreement for supplying Italy with U.S. surplus agricultural products amounting to \$60,800,000.

31 Pres. Eisenhower in a nationwide TV-radio address pledged that the U.S. would not become involved in hostilities in the middle east.

British bombers raided air fields in Egypt while a British cruiser sank an Egyptian frigate in the gulf of Suez; Gen. Sir Charles Keightley was named commander in chief of the Anglo-French forces moving on Egypt.

Lord Malvern announced his resignation as prime minister of the federation of Rhodesia and Nyasaland after serving 23 yr. as prime minister of Southern Rhodesia (1933-53) and then of the federation.

NOVEMBER

1 Hungarian Premier Imre Nagy asked that the situation in Hungary be put before the UN general assembly as Soviet forces poured back into the country.

UN general assembly met in New York in emergency session to consider the situation in Egypt.

1956 Nobel prize for physics was awarded to William H. Shockley, Walter H. Brattain and John Bardeen, all of the U.S.; chemistry prize went to Sir Cyril Hinshelwood (U.K.) and Nikolai N. Semenov (U.S.S.R.).

2 Pres. Eisenhower offered \$20,000,000 worth of food and medical supplies to Hungary.

U.S. state dept. disclosed that U.S. shipments of military supplies to Israel and Egypt had been stopped.

3 Israeli units were reported to have reached the east bank of the Suez canal.

Anthony Nutting, British minister for foreign affairs, resigned in protest against the government's policy of armed intervention in Egypt.

Iraqi and Jordanian governments confirmed that Iraqi and Syrian troops had entered Jordan.

NOVEMBER—Continued

Britain and France rejected the request of the UN general assembly for a cease-fire in the Suez canal area.

U.S. Secy. of State Dulles underwent an emergency operation in Washington, D.C., for removal of a section of the colon.

4 UN Secy. Gen. Hammarskjöld recommended the immediate establishment of a UN emergency force to supervise the cessation of hostilities in the middle east.

Moscow radio announced the formation of a new Hungarian government headed by Janos Kadar.

Pres. Eisenhower sent an urgent personal message to Soviet Premier Bulganin requesting that Soviet troops be recalled from Hungary.

UN general assembly voted (50 to 8) to send observers to Hungary to investigate the situation there.

5 British and French paratroopers were reported to have seized Port Said at the northern entrance to the Suez canal.

Soviet government announced that it was prepared to use force to crush aggression and restore peace in the middle east; White House warned that the U.S. would oppose any attempt at Soviet intervention.

6 Pres. Eisenhower and Vice-Pres. Nixon won 41 states and 457 electoral votes to win reelection to a 2nd term; Democrats retained control of both houses of congress.

U.S. state dept. issued a statement asserting that any violation of territorial integrity or internal sovereignty of Austria would be a grave threat to peace.

7 Britain and France ceased fire in Egypt at 2 A.M. (Egyptian time) and halted their advance against Egyptian forces in the Suez canal zone.

Nobel peace prize committee announced that it had found no worthy recipient for the 1955 and 1956 prizes.

Soviet troops were reported to have broken Hungarian resistance in Budapest and all other rebel centres except Győr in the northwest.

UN general assembly adopted (65 to 1) a resolution requesting Britain, France and Israel to withdraw their troops from Egypt.

8 Two U.S. Navy balloonists soared to a record altitude of 76,000 ft.

Israel agreed to withdraw its troops from Egypt as soon as satisfactory arrangements were made for a UN police force.

Pres. Eisenhower ordered administrators of the Refugee Relief act to take extraordinary measures to secure the entry of 5,000 Hungarian refugees into the U.S.

9 UN general assembly adopted a resolution calling on the U.S.S.R. and Hungary to cease interfering with the movement of Red Cross supplies into Hungary.

Pres. Eisenhower and his chief advisers briefed 23 congressional leaders on the middle east and east European situations.

10 First contingent of the UN police force to Egypt arrived by air at Naples, It., from Denmark.

White House confirmed selection of the undersecy. of labour, Arthur L. Larson, as director of the U.S. Information agency.

Soviet government said it would permit volunteers to proceed to Egypt if British, French and Israeli forces were not withdrawn.

Pres. Eisenhower rejected a Swiss proposal for a meeting in Switzerland of the heads of government of the great powers.

11 U.S. air force's first supersonic bomber, the B-58, made its maiden flight at Ft. Worth, Tex.

12 Prince Wan Waithayakon of Thailand was elected president of the regular 1956 session of the UN general assembly, opened at UN headquarters in New York city.

UNSecy. Gen. Hammarskjöld announced that Egypt had agreed to the entry into Egypt of a UN police force.

Gen. Alfred M. Gruenther, retiring supreme allied commander in Europe, was elected president of the American Red Cross, effective Jan. 1, 1957.

U.S. commerce dept. announced that the U.S. gross national product had reached the record annual rate of \$414,000,000,000 in the 3rd quarter of 1956.

13 British Colonial Secy. Lennox-Boyd announced the termination of British military operations against the Mau Mau in Kenya.

Polish government relieved former Soviet Marshal K. K. Rokossovsky of his posts as vice-premier and defense minister.

Gen. Alfred M. Gruenther, supreme allied commander in Europe, warned that the U.S.S.R. and the Soviet bloc would be destroyed if they attacked the west.

Raymond J. Saulnier of New York city was named to succeed Arthur F. Burns as chairman of Pres. Eisenhower's council of economic advisers; Paul W. McCracken of Michigan was named to the council.

14 Pres. Eisenhower stated that the U.S. would oppose through the UN any Soviet military intervention in the middle east.

15 Danish and Norwegian units, first contingents of the UN police force, arrived by air near Ismailia on the Suez canal.

Budapest central council of workers voted to continue its general strike until former Premier Nagy was restored and Soviet troops withdrawn from Hungary.

Arab league's nine members voted unanimously in Beirut, Leb., to break off diplomatic relations with Britain and France unless their forces were withdrawn from Egypt.

16 UN general assembly voted (47 to 24) to bar until 1957 debate on admission of Communist China to the UN.

17 Soviet radio broadcast a revised Soviet plan for world disarmament.

Oregon State defeated Idaho, 14-10, to win the Pacific Coast football conference title; Oklahoma defeated Missouri, 67-14, to win the Big Seven title.

Envoys of Israel and 12 NATO members walked out of a Soviet reception at the Kremlin in Moscow following a tirade by Soviet

Communist Party 1st Secy. Khrushchev.

Pres. Eisenhower approved new regulations permitting the U.S. Atomic Energy commission to make uranium available to nations desiring it for nuclear reactors dedicated to peaceful uses.

Soviet news agency announced that another Soviet nuclear test had been carried out at a great height over Soviet territory.

18 Sami es-Solh was named to succeed Abdullah el-Yafi as premier of Lebanon.

Poland was reported to have gained important economic, military and political concessions from the U.S.S.R. in an agreement signed in Moscow.

19 Hungary and U.S.S.R. asserted in the UN general assembly that there had been no mass deportations from Hungary.

Soviet government announced the appointment of former Polish Defense Minister Rokossovsky as a U.S.S.R. deputy minister of defense.

20 Gen. Lauris Norstad (U.S.) assumed command of the allied forces in Europe from Gen. Alfred M. Gruenther.

UNSecy. Gen. Hammarskjöld in notes to Britain, France and Israel asked them to explain the continued presence of their troops on Egyptian territory.

21 British Prime Minister Eden, it was announced, would fly to Jamaica for a 3-week rest.

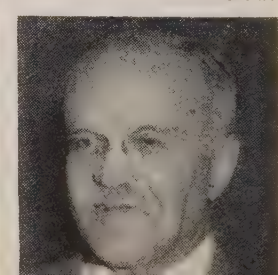
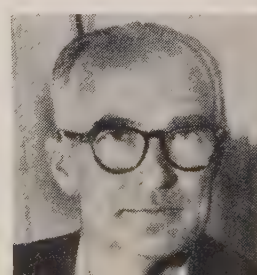
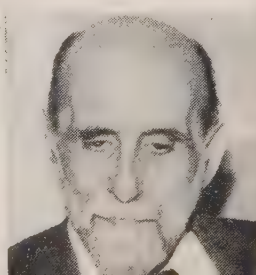
V. M. Molotov was named Soviet state control minister, to succeed V. G. Zhavoronkov.

UN general assembly adopted (55 to 10) a resolution demanding that the U.S.S.R. and Hungary stop mass deportations of Hungarian citizens.

22 Maj. Gen. E. L. M. Burns (Canada) arrived in Cairo to assume field command of the UN police force.

The pictures on this page are, left to right:

EISENHOWER.....Oct. 2
MOUNTBATTEN.....Oct. 21
JIMÉNEZ.....Oct. 25
SHOCKLEY.....Nov. 1
MOLOTOV.....Nov. 21



NOVEMBER—Continued

Pres. Eisenhower acted under the Taft-Hartley law to appoint a 3-man board of inquiry to investigate the longshoremen's strike in east and gulf coast ports.

1956 summer Olympic games were formally opened by the duke of Edinburgh at Melbourne, Austr.

23 Yugoslav Communist press reported that Soviet security police had kidnapped former Hungarian Premier Nagy.

24 Longshoremen's strike in east and gulf coast ports was enjoined under the national emergency provisions of the Taft-Hartley law.

Pres. Eisenhower named James D. Zellerbach to succeed Clare Boothe Luce as U.S. ambassador to Italy.

Yale defeated Harvard, 42-14, to win the Ivy league football championship; Michigan defeated Ohio State, 19-0, to give Iowa the Big Ten championship.

25 Britain and France announced that they would accept unlimited numbers of refugees from Hungary.

26 U.S. Defense Secy. Wilson ended a long-standing dispute by ruling that the air force should control all missiles with over 200-mi. range.

27 Pres. Eisenhower issued a statement reaffirming U.S. friendship for Britain and France.

Jordanian government announced its determination to end its treaty of alliance and friendship with Britain.

Union of South Africa announced that it would withdraw from the UN in all but token activities in protest against debate on its racial problems.

28 Chou En-lai, Chinese Communist premier, arrived in New Delhi, India, for political talks.

White House announced the appointments of Lawrence G. Derthick as U.S. commissioner of education and Ellsworth Bunker as ambassador to India.

U.S. government was revealed to have expressed to Syria concern over substantial shipments of Soviet arms to Syria.

29 Pres. Eisenhower appointed Tracy S. Voorhees as his personal representative to co-ordinate Hungarian refugee problems.

U.S. government announced that it would view with utmost gravity any hostile move against Iran, Iraq, Pakistan or Turkey.

French government completed ratification of a treaty providing for evacuation of French forces from Libya.

Texas A. and M. defeated Texas, 34-21, to win the Southwest conference football title.

30 Floyd Patterson defeated Archie Moore in a bout at Chicago, Ill., to win the world heavyweight boxing title vacated by Rocky Marciano.

U.S. government put into operation an emergency plan for shipment of oil to Europe.

U.S. Secy. of Agriculture Benson removed peanuts and extra-long staple cotton from the soil bank program.

DECEMBER

King Faisal II of Iraq issued a decree suspending parliament for 1 month and placing Iraq under martial law.

Pres. Eisenhower increased to 21,500 the number of Hungarian refugees to be given asylum in the U.S.

Tennessee defeated Vanderbilt, 27-7, to win the Southeastern football conference title.

2 Cuban planes and ground troops were reported to have wiped out a force of 42 exiled revolutionaries who landed on the coast of Oriente province.

3 Federal Reserve board and Federal Deposit Insurance Corp. announced that U.S. commercial banks would be allowed to pay a maximum 3% interest rate on savings deposits effective Jan. 1, 1957.

Rumania and U.S.S.R. signed

a new agreement to continue their economic co-operation and permit Soviet troops to remain in Rumania.

Hungarian government reiterated its refusal to permit UN observers to enter Hungary.

British and French governments pledged complete withdrawal of their troops from Egypt without delay.

U.S. state dept. suspended cultural exchanges with the U.S.S.R. in protest against Soviet actions in Hungary.

4 Douglas MacArthur II, counselor of the state dept., was named U.S. ambassador to Japan.

U.S. army announced plans to deactivate its messenger pigeon training centre.

Oklahoma was selected as the best team in U.S. college football in 1956 by the Associated Press poll of sportswriters and broadcasters and the United Press board of coaches.

British government presented to the U.S. treasury dept. a request that 1956 interest payments on U.S. loans to the U.K. be waived.

5 Hungarian government rejected UN Secy. Gen. Hammarstrand's plan to visit Budapest.

6 U.S. government protested to the U.S.S.R. concerning the use of Soviet tanks against civilians in Hungary.

U.S. state dept. announced that Iceland had withdrawn its request that U.S. forces leave Iceland.

Pres. Eisenhower ordered an air- and sealift to bring 21,500 Hungarian refugees to the U.S. by Jan. 1, 1957, or shortly after.

7 Philippines was elected a nonpermanent member of the UN Security council by the UN general assembly (51 to 20) over Czechoslovakia.

Board of trustees of Princeton university elected Robert F. Goheen, a member of the faculty, to succeed Harold W. Dodds as president in June 1957.

8 Gov. Christian A. Herter of Massachusetts was named to succeed Herbert Hoover, Jr., as undersecy. of state.

1956 summer Olympic games ended in Melbourne, Austr.; in unofficial press scoring Soviet athletes scored 722 pt., U.S. athletes 593 pt.

10 Pres. Eisenhower catalogued a list of human rights which he said had been denied to the people of Hungary by Soviet terror and brutality.

Motion-picture industry revised and relaxed its code of morals and taboos for the first time since its adoption in 1930.

UN general assembly approved the nomination of Auguste R. Lindt (Switz.) as UN high commissioner for refugees.

International Monetary fund announced approval of a request by Britain to purchase with sterling from the fund up to the full amount of its \$1,300,000,000 quota.

11 U.S. interior dept. released a plan of action for assisting Britain and other European nations with increased oil shipments.

12 Paul E. Magloire, Haitian chief of state, resigned in the face of a nationwide general strike.

UN general assembly (55 to 8) censured Soviet intervention in Hungary and called for withdrawal of Soviet forces under UN supervision.

U.S. Atomic Energy commission announced that it was opening to the public a large volume of secret atomic information.

UN Security council voted unanimously to recommend Japan for membership in the UN but again rejected the application of Outer Mongolia.

13 U.S. defense dept. announced the formation of an expanded military air transport service under air force management.

UN general assembly approved the termination of trusteeship for British Togoland and its merger into the Gold Coast.

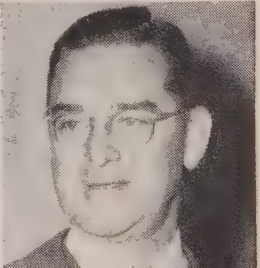
Hans Streuli was elected president of the Swiss confederation for 1957 at a meeting of the joint federal assembly.

14 Brazil was revealed to have purchased a 19,000-ton aircraft carrier from the U.K.

North Atlantic council concluded a 4-day meeting in Paris

The pictures on this page are, left to right:

BURNS	Nov. 22
LUCE	Nov. 24
HOOVER	Dec. 8
ISHIBASHI	Dec. 20
WHITNEY	Dec. 27



DECEMBER—Continued

with a statement declaring its members in general agreement on issues confronting NATO.

John Diefenbaker of Saskatchewan was elected leader of the Canadian Progressive Conservative party at a conference in Ottawa.

15 Pres. Eisenhower made available \$4,000,000 to the UN fund for aid to Hungarian refugees in Austria.

Soviet troops were reported to have been driven out of Miskolc, near the Czechoslovak border, in a pitched battle with Hungarian rebels.

British army commander in northern Ireland ordered his troops to take action against Irish Republican attacks believed to originate in the republic of Ireland.

16 British forces turned over control of most of Port Said to UN forces and retired to a narrow waterfront perimeter.

Indian Prime Minister Nehru arrived in Washington, D.C., for talks with Pres. Eisenhower.

17 Gasoline rationing was resumed in Britain for the first time since May 1950.

Brazil agreed to permit the U.S. to install a guided-missile tracking station on Fernando de Noronha island in the South Atlantic.

A Soviet-Polish accord signed in Warsaw defined conditions for the temporary stationing of Soviet troops in Poland under the Warsaw pact.

18 UN general assembly elected (77 to 0) Japan as the 80th member of the UN.

Bowden Wyatt of the University of Tennessee was named football coach of the year in a poll of the American Football Coaches Assn.

19 British government issued a white paper proposing limited self-government for Cyprus under a strong governor.

UN general assembly elected Colombia, Iraq and Sweden to nonpermanent seats on the UN Security council.

U.S. Vice-Pres. Nixon arrived in Austria by air to survey the Hungarian refugee situation.

C. D. Howe, Canadian defense production minister, announced that Canada would sell 225 jet fighters to west Germany.

20 Japanese diet (291 to 150) elected Tanzan Ishibashi to succeed Ichiro Hatoyama as premier.

Hungarian government reinstituted a decree permitting the jailing without trial of those who disturbed the public order or production.

Chou En-lai, Chinese Communist premier, arrived in Karachi on a 10-day official visit to Pakistan.

21 U.S. Export-Import bank offered Britain a credit of up to \$500,000,000 for purchases in the U.S.

22 British and French troops completed their evacuation of Egypt and UN forces took over the policing of occupied areas.

Col. Maludin Simbolon, 37-yr.-old Indonesian army commander, proclaimed himself military and political leader of central Sumatra in the wake of a bloodless army coup.

Mickey Mantle of the New York Yankees baseball team was named the male athlete of the year in a poll of sportswriters and sportscasters.

23 Soviet Communist party denounced elements inside the communist world who placed nationalism above unity with the U.S.S.R. and other communist nations.

24 Egypt submitted a resolution to the UN general assembly demanding reparations from Britain, France and Israel for their military attacks.

Central committee of the Soviet Communist party issued a call for strenuous efforts to improve economic conditions within the U.S.S.R.

25 U.S. Vice-Pres. Nixon in a nationwide radio-TV address urged all Americans to contribute freely to Hungarian relief agencies.

Mikhail G. Pervukhin was named to replace Maxim Z. Saburov as chairman of the Soviet state commission for current planning.

Indonesian Pres. Sukarno declared a state of emergency and siege in north and central Sumatra.

26 A large number of Negroes in Birmingham, Ala., defied the city law requiring racial segregation on buses.

Egyptian Suez canal authority reported that clearance of the canal had started in 2 places.

Associated Press reported a record 883 persons killed accidentally in the U.S. over the Christmas weekend.

Arthur S. Flemming, U.S. defense mobilizer, announced that he had refused to approve about \$2,300,000,000 worth of pending applications by the steel industry for accelerated tax amortization certificates.

27 Pres. Eisenhower announced the selection of John Hay Whitney of New York to succeed Winthrop W. Aldrich as U.S. ambassador to Britain.

28 Chinese Communist party in a radio broadcast reaffirmed its approval of Soviet military activities in Hungary and denounced Titoism.

Pres. Eisenhower authorized a

2nd U.S. round-the-world air line by permitting Trans World Airlines to link its international operations with Northwest Airlines.

29 Hungarian government announced mass dismissals of industrial workers and government employees effective Jan. 1, 1957.

Pres. Eisenhower designated fire-damaged regions around Malibu, Calif., as a major disaster area.

Federal Bureau of Investigation reported that more major crimes were committed in the U.S. in 1956 than in any previous year.

Official announcement stated that former Burmese Premier Nu would rejoin the government and resume the premiership.

30 Egyptian government consented to the immediate start of full-scale clearance of the Suez canal.

New York Giants defeated the Chicago Bears, 47 to 7, to win the National Professional Football league championship.

Budapest radio announced a Soviet loan to Hungary of the equivalent of \$50,000,000 for purchases in the west.

31 Brazil and U.S. signed an agreement providing for sale to Brazil of \$138,700,000 worth of U.S. surplus farm products.

U.S. Interstate Commerce commission authorized a 5% passenger fare increase on all western railroads and 8 eastern railroads and a 7% increase in Pullman fares.

Sabri el-Assali, Syrian premier, announced formation of a new cabinet including several leftists.

U.S. Secy. of State Dulles stated that in 1957 the U.S. would have to accept an increasing responsibility to assist free nations in the middle east and elsewhere to maintain their freedom and develop their welfare.

Football Bowl Games, Dec. 29, 1956

Gator Bowl (Jacksonville, Fla.)—Georgia Tech, 21; Pittsburgh, 14.

Jan. 1, 1957

Rose Bowl (Pasadena, Calif.)—Iowa, 35; Oregon State, 19.

Sun Bowl (El Paso, Tex.)—George Washington, 13; Texas Western, 0.

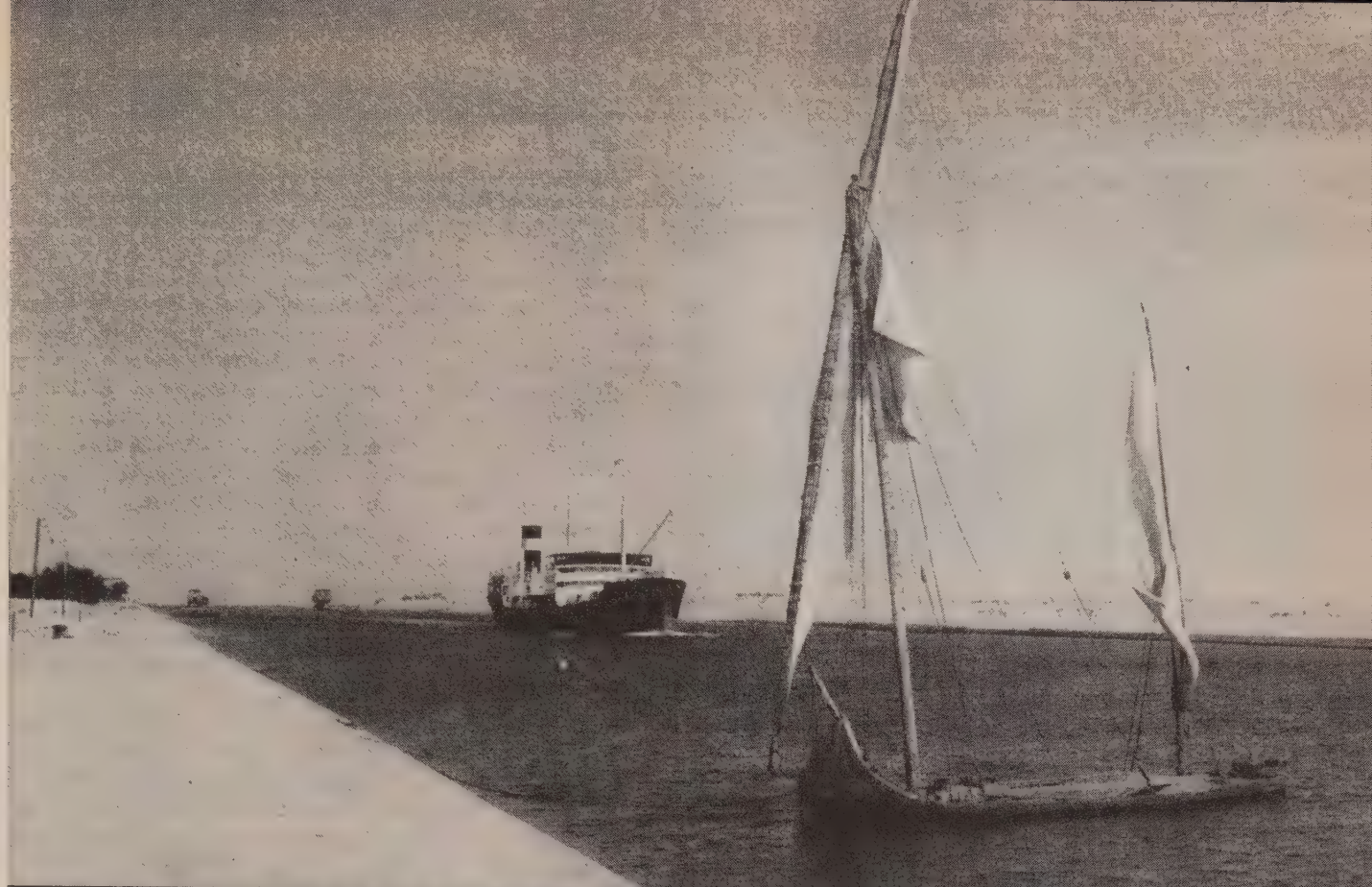
Tangerine Bowl (Orlando, Fla.)—West Texas, 20; Mississippi Southern, 13.

Prairie View Bowl (Houston, Tex.)—Prairie View A. and M., 27; Texas Southern, 6.

Cotton Bowl (Dallas, Tex.)—Texas Christian, 28; Syracuse, 27.

Sugar Bowl (New Orleans, La.)—Baylor, 13; Tennessee, 7.

Orange Bowl (Miami, Fla.)—Colorado, 27; Clemson, 21.



BOOK OF THE YEAR

Abyssinia: *see* ETHIOPIA.

Academy of Arts and Letters, American: *see* SOCIETIES AND ASSOCIATIONS, U.S.

Academy of Political and Social Science, American: *see* SOCIETIES AND ASSOCIATIONS, U.S.

Accident Insurance: *see* INSURANCE.

Accidents. The death toll from accidents in the United States in 1955 was 93,489, an increase of 4% over 1954. There were 9,350,000 nonfatal injuries, about 340,000 of which resulted in some degree of permanent disability. Information available through Aug. 1956 indicated that the 1956 accidental death toll would be higher than in 1955, probably by about 3%.

The annual accidental death toll in recent years has been exceeded only by deaths from heart disease, cancer and cerebral haemorrhage. However, a study by the American Medical association revealed that accidents rob the nation of more working years than any disease. The reason is that most accident victims are struck down before or during their productive life, while disease deaths occur when the working years are largely past.

The 44th National Safety congress, held in Chicago, Ill., in Oct. 1956, marked 44 years of the organized national safety movement, of which the hub has been the National Safety council and affiliated local safety organizations.

Safety work is carried on continuously by progressive industries and by a large number of organizations, both governmental and private, operating in their particular fields of activity, such as industry, street traffic, school, home and farm.

Serving as a clearinghouse for all accident prevention activity, the National Safety council attempts to discover the facts

of accident occurrence; to devise or help devise engineering, educational and enforcement measures for prevention; to assist in determining engineering requirements for the safe design, construction and use of machines and equipment; to help formulate model safety legislation; to participate in planning and executing training and educational programs; to disseminate information to interested groups and to the general public, and to encourage and assist the establishment and functioning of community and state safety organizations. The council is chartered by the federal government.

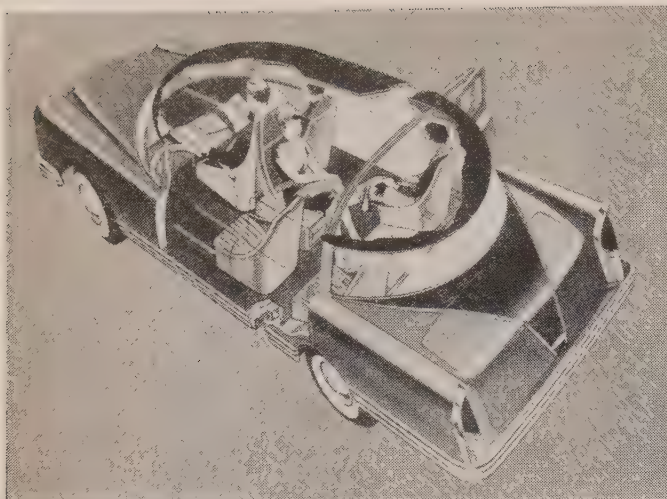
Work Safety.—At the end of the first eight months of 1956 the occupational death toll was slightly less than in 1955. Deaths of this type in 1955 totalled 14,200.

Most progressive industries were engaged in vigorous safety efforts in 1956. Many of them carried their activities beyond the plant gates, both as a community obligation and because they realized that off-the-job accidents seriously disrupt in-plant operations.

The National Safety council conducted a special emphasis campaign in 1956 against roof fall accidents in mines, the chief cause of death and serious injury in mining. Such accidents dropped 29% during the campaign, with 122 of the 250 enrolled mines achieving a reduction of 50% or more. A follow-up survey six months later of a 50-mine sample showed an average reduction of 32%, proving the continuing effect of the campaign.

The success of this single-hazard approach prompted the launching late in 1956 of a nationwide campaign against falls, second only to motor vehicle accidents as an accident killer.

Traffic Safety.—During the first eight months of 1956, there were 25,350 motor vehicle deaths in the United States, an increase of 8% over the comparable period of 1955. The eight-month total was the largest for that period on record, the previous high



SAFE SEATING for automobile passengers, a design resulting from a joint study by Cornell Aeronautical laboratory and the Liberty Mutual Insurance company in 1956. A full scale model of the car was to be built in 1957

being in 1937. At the rate of increase, a new all-time high of between 41,000 and 42,000 was anticipated.

On a mileage basis the traffic accident picture also was unfavourable. Mileage was up about 6%, resulting in a mileage death rate (deaths per 100,000,000 mi.) of about 6.0, an increase from 1955.

In May 1956 the President's Committee for Traffic Safety sponsored four regional conferences, in Atlantic City, N.J., Miami, Fla., Chicago, Ill., and San Francisco, Calif., to stimulate the formation of state and city public support groups for traffic safety. During the summer, the State Safety Coordinators conducted a "Slow Down and Live" campaign. Late in the year the National Safety Council launched a "Back the Attack on Traffic Accidents" which was to continue through 1957, designed to stimulate public officials to more vigorous control measures and to enlist the support of citizens.

The council declined to grant its top award to any state or city for all-around traffic safety performance in 1955. However, Minnesota and four cities, Dallas, Tex., Seattle, Wash., Oklahoma City, Okla., and Palo Alto, Calif., were granted awards of merit.

Farm Safety.—Three more states organized state farm safety committees in 1955, bringing to 38 the number of states with functioning farm accident prevention organizations. Seventeen states had full-time farm safety specialists. These committees and individuals worked through many public and private agencies

to spread information on the farm accident problem and its solutions.

The Farm clinic, held in conjunction with the President's Occupational Safety conference in Washington, D.C., in May, drafted a set of farm safety recommendations which were being put into effect by the department of agriculture, co-operating agencies and farm organizations.

For the 13th consecutive year, the president of the United States proclaimed a National Farm Safety week, in July 1956, which focused attention on accidents to rural residents.

School and Child Safety.—Accidents rank first as a cause of death to children and young people from 1 to 24 years of age. Nevertheless, it is in this age group that the most dramatic reductions in the accidental death rate have been made.

For children under 5 years of age, the accidental death rate in 1956 for all types of accidents was less than half the rate at the turn of the century, while the motor vehicle rate alone was about 15% lower than the 1928-32 average rate, the highest on record. For children 5 to 14 years old the 1955 total rate was 51% less than the 1903-12 average, while the motor vehicle rate was about half the 1923-27 average, the peak for this age group.

Home Safety.—The 1955 death toll in home accidents in the United States was 28,000. The majority of the fatalities were among the very young and elderly persons. Falls were the chief cause. Estimates for 1956, based on the first eight months, indicated that home fatalities in 1956 would be slightly higher than in 1955.

A new home safety inventory plan to tabulate home safety activities and evolve standards of performance promised further progress in this field.

Canada.—In Canada there were 8,380 accidental deaths in 1954 (the latest year for which complete figures were available as of late 1956). This was a slight decrease in number, and a reduced average of 55.2 deaths per 100,000 population. As in the United States, accidents ranked fourth as a cause of death to persons of all ages. Motor vehicle accidents were the most important type in Canada in 1954, causing 2,867, or about 34% of all accidental deaths. Falls were second with 1,496 deaths. Other leading causes were: drowning, 1,107; burns, 513; railroad, 309, and poison gases, 176.

(See also DEATH STATISTICS; DISASTERS.) (M. E. Hr.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Anyone At All* (1954); *Casualty Insurance* (1954); *Insurance Against Fire Losses* (1952).

ACTH: see ENDOCRINOLOGY.

Aden. Aden is the name of a British colony and a protectorate on the south coast of Arabia. Governors in 1956: Sir Tom Hickinbotham and (from August) Sir William Luce.

Colony.—Area: 108 sq.mi., including Perim Island (5 sq.mi.) and Kuria Muria Islands (28 sq.mi.). Pop.: (1946 census) 80,876, Perim 360, Kuria Murias about 2,200; (1955 census) 138,441, excluding Perim (Arabs 75.2%; Indians and Pakistanis 11.4%; Somalis 7.7%). Languages: Arabic, also Indian languages and Somali. Religion: Moslem 91.3%, Hindu 3.5%. Chief towns (pop., 1955): Aden (Crater, etc.) 99,285; Sheikh Othman 29,879. Administration: governor; executive council; legislative council with equal official and nominated unofficial representation; Kuria Murias are administered for Aden by British Persian gulf residency.

Protectorate.—Area: about 112,000 sq.mi. Pop. (1955 est.): 800,000. Language: Arabic. Religion: Moslem. Administration: by rulers, with British political officers' advice.

Western Area.—Eight sultanates, one amirate, one sharifate and eight sheikhdoms. Total pop. (1955 est.): 450,000. Headquarters of adviser and British agent: Lahej (pop. about 12,000).

Principal Types of Accidental Deaths in U.S., 1903-1955

Year	Motor-Vehicle	Falls	Burns*	Drownings†	Rail-road	Fire-arms	Poison Gases	Poisons (Except Gas)
1903-1912 av. . .	1,200	†	†	9,000	10,700	2,100	†	†
1913-1922 av. . .	9,600	13,500	9,200	7,900	8,900	2,600	†	3,000
1923-1927 av. . .	21,700	15,500	8,800	7,400	7,300	2,900	2,900	2,700
1928-1932 av. . .	30,900	17,800	7,800	7,700	6,100	3,100	2,400	2,600
1933-1937 av. . .	36,313	21,442	7,314	6,950	5,338	2,883	1,641	2,148
1938-1942 av. . .	33,549	23,100	7,106	6,550	5,068	2,565	1,502	1,832
1943-1947 av. . .	28,458	23,820	8,192	6,708	4,882	2,477	1,978	1,879
1948 (5th rev.) . .	32,259	24,800	7,668	6,500	3,976	2,270	2,002	1,713
1948 (6th rev.) . .	32,259	22,000	6,800	6,500	3,800	2,330	2,020	1,600
1949	31,701	22,308	5,982	6,684	3,571	2,326	1,617	1,634
1950	34,763	20,783	6,405	6,131	3,667	2,174	1,769	1,584
1951	36,996	21,376	6,788	6,489	3,631	2,247	1,627	1,497
1952	37,794	20,945	6,922	6,601	3,189	2,210	1,397	1,440
1953	37,955	20,631	6,579	6,770	3,187	2,277	1,223	1,391
1954	35,586	19,771	6,083	6,334	2,616	2,281	1,223	1,339
1955	38,426	19,800	6,300	6,500	2,850	2,200	1,100	1,250

*Includes burns by fire and deaths resulting from conflagration, regardless of nature of injury; also burns by chemicals, steam, hot substances in 1948 (5th revision) and earlier years.

†Includes drownings in water transport accidents.

‡Comparable data not available.

Source: National Office of Vital Statistics, except that railroad estimates prior to 1933 are based on data from Interstate Commerce Commission. From 1903 to 1932 the other figures are estimates based on data for states in the official registration area. From 1933 to 1948 (5th revision) the figures are those published by NOVS plus National Safety Council estimates of falls in agricultural accidents and drownings in water transport accidents. 1949 to 1954 figures are NOVS totals. 1948 (6th revision) and 1955 figures are NSC estimates.

Premier chief, Ali Abdulkarim, sultan of Lahej; British agent in 1956, G. K. N. Trevaskis.

Eastern Area.—Seven sultanates and two sheikhdoms (including the Hadhramaut). Total pop. (1955 est.): 350,000. Chief towns: Mukalla (port; headquarters of resident adviser and British agent); Saiun; Tamridah (Socotra). Premier chief, Sir Salih bin Ghalib al-Qu'aiti, sultan of Shihr and Mukalla; British agent in 1956, Col. J. E. H. Boustead.

Kamaran (area 22 sq.mi.; pop. about 2,200) is in the Red sea off the Yemen coast. Governor, governor of Aden ex officio; commissioner in 1956, Lieut. Col. R. G. W. E. Alban.

History.—In March the governor met the rulers of the eastern and western protectorates to discuss the formation of some form of closer association between the various territories of each protectorate for their mutual assistance and support and to strengthen their internal economy and social organization. A statement signed in April by all the protectorate rulers who had attended the meeting affirmed their belief that the development and progress of their countries depended on close association and co-operation, and they welcomed the British government's assurance that they and their peoples would be free to negotiate among themselves the most appropriate form of association.

In the colony the development of Little Aden, where the new oil refinery was sited, was furthered by a British government loan of £4,000,000 repayable over 30 years. In August Sir Tom Hickinbotham was succeeded as governor by Sir William Luce.

Education.—(1954) *Colony:* Schools: primary 32, pupils 7,157, teachers 293; secondary (including one technical college with 150 students) 14, pupils 2,277, teachers 112. Teachers' training classes two, students 20. Aden college provides postsecondary education for men. *Protectorate:* Schools (excluding private): primary 107, pupils 7,110, teachers 288; secondary 6, pupils 400, teachers 30.

Finance and Trade.—Monetary unit: East African shilling valued at 14 cents U.S. Budget (1954–55): revenue £2,813,824; expenditure £2,929,079. Foreign trade (1955): imports £73,600,000; exports £62,700,000. Principal products (1955): salt, 275,000 long tons; salted fish. Entrepôt trade.

Adenauer, Konrad (1876–), German lawyer and statesman, was born at Cologne, Jan. 5. He was educated at the Gymnasium St. Aposteln, Cologne, and at the universities of Freiburg im Breisgau, Munich and Bonn.

In 1906 he was elected councillor and deputy mayor of Cologne, becoming lord mayor (*Oberbürgermeister*) in 1917. A leading member of the Catholic Centre party, he was a member of the Prussian *herrenhaus* from 1917 to 1918 and Prussian *staatsrat* from 1918 to 1933 (president 1928–33). He was dismissed by the nazis from the position of lord mayor in July 1933 and a year later was imprisoned for a short time during a drive against Catholic leaders. He was again imprisoned in 1944 after the attempt on Adolf Hitler's life. The U.S. occupation authorities made him mayor of Cologne in the spring of 1945, but in October the British, who had taken over the area, dismissed him, forbidding him to take part in politics; however, this prohibition was soon removed. A foundation member of the Christian Democratic union in Sept. 1945, he was president (1948–49) of the parliamentary council of the three western zones which drafted the constitution of the German Federal Republic. He became chancellor of the republic on Sept. 15, 1949.

Adenauer's chancellorship was marked by the substantial economic recovery of the republic and by renewed German participation in international affairs. Having triumphantly won the general election of Sept. 6, 1953, he remained federal chancellor. By signing in Paris, on Oct. 23, 1954, a series of agreements with the western powers, Adenauer succeeded in restoring German sovereignty, getting the right to rearm and obtaining membership in the North Atlantic Treaty organization (NATO) for the German Federal Republic.

On May 5, 1955, at Bonn, he presided over the ceremony of the formal attainment of sovereignty by the German Federal Republic. Four days later, in Paris, he attended a meeting of the NATO council at which the German Federal Republic joined the organization as its 15th member.

On June 5, 1956, at Luxembourg, together with Guy Mollet, the French premier, he signed an agreement on political integration of the Saar with the German Federal Republic. A few days later he visited the United States where on June 14 he conferred with Pres. Dwight D. Eisenhower. On Oct. 16 he reshuffled his cabinet; among others, he dropped his minister of defense, Theodor Blank, replacing him with Franz Josef Strauss.

In a foreign policy statement in November, he deplored the intervention of France and Great Britain in Egypt as an inadmissible use of force, and Soviet oppression in Hungary as a violation of the United Nations charter and of international law.

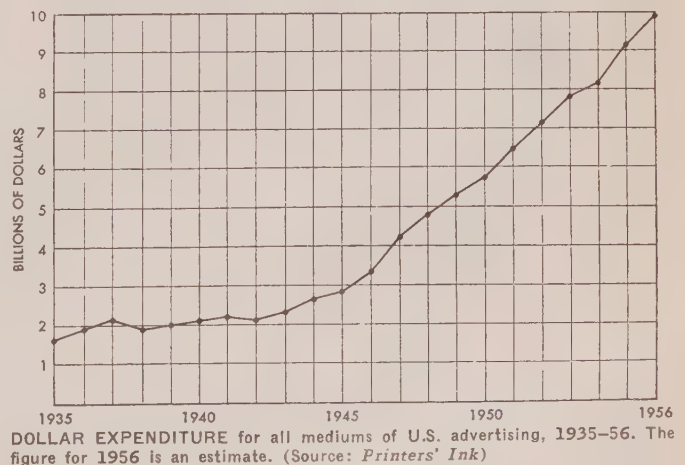
Adult Education: see EDUCATION; LIBRARIES.

Advertising. The year 1956 was marked in the United States by the rise of total advertising expenditures to almost \$10,000,000,000, by higher unit costs for advertisers, and by the imposition of various restrictions upon the operation of advertising mediums and agencies as the result of a federal antitrust action.

The estimated total investment in advertising in 1955 was \$9,194,400,000, or 12.6% more than in the year before. It was forecast that these expenditures might increase by \$800,000,000 during 1956, to reach a total of almost \$10,000,000,000 for the year. Estimates of advertising volume during recent years are as follows: 1950—\$5,710,000,000; 1951—\$6,426,100,000; 1952—\$7,156,200,000; 1953—\$7,755,300,000; 1954—\$8,164,100,000; 1955—\$9,194,400,000.

It was estimated that 59% of total 1956 expenditure was in national advertising, such as network television and radio, magazines, and in newspapers where the advertising was placed at national rates, as by advertisers other than local merchants. The breakdown of the total figure including both national and local advertising by expenditures in the various mediums was as follows: newspapers, 33.6%; magazines, 7.9%; television, 11.1%; radio, 5.9%; farm publications, 0.4%; direct mail, 14.1%; business publications, 4.9%; outdoor, 2.1%; miscellaneous, 20.0%.

Part of the increased volume of advertising resulted from higher charges for space and time. An estimate made at mid-1956 by Standard Rate and Data service revealed that time charges had been boosted by 146 television stations for an average increase of 21.6%; 487 newspapers had raised rates an average of 11.4%; 275 business publications had increased rates and 6 had



lowered them, but that the over-all average rise was 16.5%; and 100 consumer magazines had increased their rates while 11 were lowering them, the over-all rise being 14.1%. Radio was the only major medium showing an over-all reduction in rates, registering a drop of 6.7%.

Newspapers.—An estimate based upon a study by the Association of National Advertisers showed that the cost of reaching 1,000,000 newspaper readers in 1956 was 20% higher than in 1950, newspapers' rates having risen 28% during that period while circulations had gone up only 6%.

Advertising volume in newspapers in 1955 was \$695,000,000, a new high, and almost 17% greater than the \$594,120,000 total for 1954. In the first six months of 1956 the lineage of national newspaper advertising was 7.14% higher than for the comparable period of 1955.

The number of newspapers offering colour for run-of-paper advertising continued to increase, standing at 539 compared with 499 the year before. Colour lineage figures compiled for 50 leading newspapers in cities measured by Media Records revealed total lineage for 1955 nearly 30% higher than for 1954, with this rate of gain being maintained for the first three months of 1956.

Although there was considerable alarm over the possible effect of the newsprint shortage on advertising volume and other aspects of newspaper publishing, there were only scattered instances where papers had to reduce advertising for one or more issues because of lack of paper.

Paid circulation of daily papers exclusive of Sunday editions in 1955 was 55,837,834, compared with 54,860,429 in 1954. There were 1,963 dailies published, compared with 1,999 in 1954.

Magazines.—Magazine advertising volume and advertising rates continued to increase during 1956. The Magazine Advertising bureau reported that the increase in advertising volume in the first six months of the year was the largest on record, with gains of 7% in pages of advertising and 13.5% in revenue over the same period of 1955. The bureau expected that the volume of advertising of \$650,000,000 achieved in 1955 would be in-

creased by approximately \$100,000,000 in 1956.

A comparison with 1950 showed that by 1956 magazine costs to advertisers had risen faster than readers, with the result of an increase in cost per 1,000 circulation of 26%. Magazine circulations in general were 9% larger.

Crowell-Collier Publishing company ceased publication of the *American Magazine*, stating that its larger and more influential magazines duplicated the editorial function of the suspended publication. The Federal Trade commission ruled that the acquisition by *Farm Journal* of Curtis Publishing company's *Country Gentleman-Better Farming* was a violation of the antimerger provisions of the Clayton act, in that it eliminated one of only two substantial nation-wide general farm magazines, resulting in a tendency toward monopoly.

Television and Radio.—Advertising volume in television was estimated at \$1,005,000,000 in 1955, compared with \$803,600,000 in 1954. Of this total, approximately half was spent in network and half in spot and local television. Data issued by the Television Advertising bureau showed that 3,000 national and regional advertisers spent a total of \$103,872,000 in national and regional spot television in the last three months of 1955, and that 2,702 invested \$100,209,000 in the first quarter of 1956. These estimates of the bureau were for time and facilities only.

According to the Advertising Research foundation, 73% of households had television in 1956, or 35,495,330 of the 48,784,600 U.S. total. The number of television stations operating commercially was set at 427 at the beginning of 1956, compared with 410 as of May 1, 1955.

The audiences of network television had grown rapidly, with the result that the cost to the advertiser per million home hours of television viewing was calculated in 1956 at little more than a third of what it was in 1950, although the average hourly rate had almost quadrupled during that time. The index of home hours of television use in 1956 was estimated at 1,054, compared with 100 in 1950.

Colour television was not selling so rapidly as had been expected. A poll of customers showed that most objections were based upon high price of sets, defect in colour and inadequate colour programming.

The Station Representatives association reported that national spot time sales of radio reached \$10,601,000 in Aug. 1956, or 28.5% ahead of Aug. 1955. For the first eight months of 1956, spot radio was 21.5% ahead of the comparable period for 1955, standing at \$86,366,156.

Network radio continued its decline. The volume of advertising in this medium was estimated at \$90,000,000 in 1955, compared with \$114,500,000 in 1954. Competition with television was causing cuts in network radio rates, with the result of reducing the cost to the advertiser of an hour of network time by about 44% since 1950. However, the reduction in the home hours of radio listening per day caused a slight rise of 2% in the cost to the advertiser per million home hours of listening.

Other Mediums.—Direct mail was expected to reach a volume of \$1,750,000,000 in 1956, an increase of \$250,000,000 over 1955, according to the Direct Mail Advertising association. A bill to increase postal rates failed of passage in the 84th congress.

Business publications also improved their advertising volume during the year, and it was estimated that \$440,200,000 would be invested in this medium during 1956. With the inclusion of about \$50,000,000 additional in production costs, the total figure would total 10% more than in 1955. It was announced by Printers' Ink Publishing company that the magazine *Printers' Ink*, founded 68 years earlier, would be acquired by a nonprofit foundation.

Outdoor advertising in 1955 touched a record high of \$114,-



"DON'T YOU HAVE SOMETHING THAT JUST SMELLS NICE AND LADY-LIKE? . . . I'm a little old for all this action!" a 1956 cartoon by Lichty of the Chicago Sun-Times syndicate

464,812, compared with \$111,500,000 the year before. During the year there was a merger of Outdoor Advertising, Inc., and the Standard Group of Outdoor Advertising companies, both organizations having been engaged in the selling and promotion of the medium.

Advertising Agencies.—The bureau of the census issued data on advertising agencies that it had collected in the 1954 census of business. Different techniques in enumeration and compilation invalidated some comparisons with data from the 1948 census of business. However, it was indicated that the number of agencies with payrolls increased from 2,906 in 1948 to 3,268 in 1954, a rise of 12.5%, and that the number of paid employees rose from 38,739 to 46,046 during these six years. The total number of agencies was given as 5,077, compared with 3,279 in 1948.

It was found that New York contained almost one-fourth of the agency establishments, followed by California with 11.8%; Illinois, 10.7%; Pennsylvania, 6.1%; Ohio, 5.8%. The 10 leading states accounted for 74.7% of all establishments and 91.3% of all agency receipts.

Advertising Research.—The Advertising Research foundation published its study on Printed Advertising Rating Methods, the study having been carried out by Alfred Politz Research, Inc., under foundation auspices. It concerned the three major methods of measuring impressions left on readers of printed advertisements, specifically those in a single issue of *Life*. The methods studied were aided-recall, of Gallup-Robinson; recognition, of Starch; and reader-interest, of Readex.

A survey by the Association of National Advertisers showed that the positioning of newspaper advertisements is considered of importance by 92% of the 133 member companies of the association reporting on the subject. The study showed that 88% of the companies make requests for particular positions on all or most of the advertising they place. However, readership findings from Advertising Research foundation studies which supplemented those of the A.N.A. investigation show that readership is from 2% to 4% higher for left-hand pages, whereas most advertisers request positions on right-hand pages.

Government.—During the year consent decrees were signed by the American Association of Advertising Agencies and five associations of mediums as the result of an antitrust action instituted by the government in May 1955, in which the associations were charged with collusion and conspiracy in restraint of trade. First the American Association of Advertising Agencies agreed to the terms of the decree, in which it was restrained from taking any action toward fixing, establishing or stabilizing agency commissions; requiring or advising any advertising agency to refrain from rebating or splitting agency commissions; and requiring, urging or advising any advertising agency to refrain from submitting advertising copy, art work, illustrations or similar material to advertisers in the solicitation of new accounts.

The American Newspaper Publishers association also signed a consent decree in which it was enjoined from establishing or stabilizing agency commissions or attempting to do so; urging any agency to refrain from rebating or splitting agency commissions; requiring or urging any medium to deny or limit credit or agency commission due or available to any advertising agency; requesting any medium not to do business with or not to recognize any advertising agency. Similar decrees were imposed upon the other mediums that were parties to the suit.

This victory for the government touched off a debate among advertisers, agencies and mediums as to the justification of the traditional 15% agency commission. The Association of National Advertisers formed a committee to study the whole question of agency compensation.



ADVERTISING STUNT In San Diego, Calif. During a gasoline sales price war in 1956, one service station owner prepared the dummy prop on the right and placed it in the engine compartment of an old car to attract customers

Canada.—In 1956 Canada enacted a 20% tax on advertising in Canadian editions of United States magazines, effective Jan. 1, 1957. It was calculated that the tax would produce \$1,500,000 revenues for Canada. 80% of this from *Reader's Digest* and *Time*. It was expected that the U.S. magazines would raise their rates as the result.

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ENCYCLOPEDIA BRITANNICA FILMS.—*The Importance of Selling* (1952); *Industrial Purchasing* (1952); *Modern Lithographer* (1940).

Aeronautics: see AVIATION, CIVIL; AVIATION, MILITARY.

Afghanistan. An independent kingdom in central Asia, Afghanistan is bounded north by the U.S.S.R., west by Iran, south and southeast by Pakistan and east by China. Area: about 251,000 sq.mi. Pop. (1953 est.; no census ever taken): 13,000,000. Races: Pakhtu or Pathan 60.5%, Tajik 30.7%, Uzbek 5%, Hazarah (Mongoloid) 3%. Languages: Pakhtu and Persian. Religion: Sunni (Hanafi) Moslem. Chief towns (pop., 1953 est.): Kabul (cap.) 310,000; Kandahar 195,000; Herat 150,000; Mazar-i-Sharif 100,000. King, Mohammed Zahir Shah. Prime minister in 1956, Mohammed Daud Khan.

History.—On Dec. 18, 1955, during the visit to Kabul of N. A. Bulganin, the Soviet premier, and N. S. Khrushchev, first secretary of the Communist party of the Soviet Union, a protocol was signed extending for ten years the Soviet-Afghan treaty of neutrality and nonaggression of 1931. On the same day it was announced that the U.S.S.R. granted to Afghanistan a 30-year credit of \$100,000,000 at an annual rate of interest of 2%.

On Jan. 28, 1956, a joint Soviet-Afghan statement said that the U.S.S.R. would ensure delivery of "equipment and materials" on account of this credit, and would also grant "other services connected with technical assistance in building certain installations" in many branches of Afghan economy.

According to Pakistani sources, \$40,000,000 of the Soviet credits was earmarked for arms from the U.S.S.R. and Czechoslovakia and \$60,000,000 for building airports and roads.

On his way to India, A. I. Mikoyan stayed in Kabul on March 21-22. Adnan Menderes, the Turkish prime minister, paid a five-

day visit to Afghanistan in July. In August Maj. Gen. Iskander Mirza, the president of Pakistan, stayed four days in the Afghan capital. It was believed that both Menderes and Mirza discussed at Kabul the possibility of Afghanistan's joining the Baghdad pact, the problems of the Pathan or Pakhtu tribesmen and their aspiration for a "Pakhtunistan" state.

On Jan. 27 King Zahir approved the new cabinet still headed by Mohammed Daud Khan, a king's cousin, who also held the portfolio of defense; Naim Khan, another king's cousin, continued as foreign minister and second deputy premier; Ali Mohammed Khan became first deputy premier. Daud had thus finally succeeded in ousting from the government the supporters of Gen. Mohammed Arif, minister of defense, who had been dismissed and put under arrest at the beginning of Dec. 1955. At the same time more than 70 other persons, both army officers and civilians, had also been arrested.

Education.—Schools (1955): primary 360, pupils 210,000; secondary 25, pupils 22,000; vocational 7, pupils 1,850; teacher training 4, students 2,460. Students at institutions of higher education (including University of Kabul) 2,700 in 1955.

Finance.—Monetary unit: afghani, with an exchange rate of 16.80 afghani to the U.S. dollar. Budget (1954-55 est.; 1955-56 est. in parentheses): revenue 746,000,000 afghanis (878,000,000 afghanis); expenditure 1,141,000,000 afghanis (1,301,000,000 afghanis). Currency circulation: (March 1954) 922,000,000 afghanis (March 1955) 1,083,000,000 afghanis. Deposit money: (March 1954) 415,000,000 afghanis (March 1955) 885,000,000 afghanis.

Foreign Trade.—(March 1954-55): imports 1,000,000,000 afghanis, exports 1,403,000,000 afghanis. Principal imports (chiefly from U.S., German Federal Republic, Pakistan, India, U.S.S.R.): sugar, cotton textiles, building materials, petroleum products. Principal exports (chiefly to India, Japan, U.S., German Federal Republic, Pakistan, U.S.S.R.): karakul (Persian lamb) skins (2,000,000), cotton (12,500 metric tons), carpets (150,000 m. in 1952), wool, fresh and dried fruit.

Transport and Communications.—Roads (1955): 5,111 km., gravel. Motor vehicles in use (1952): passenger 880, commercial 4,360. Telephones (Jan. 1955): 8,452. Radio receiving sets (1955): 25,500.

Agriculture.—Production (metric tons, 1955; 1954 in parentheses): cottonseed 39,000 (39,000); lint cotton 20,000 (20,000); raw beet sugar, 6,000 (6,000); wool (clean basis) 3,000 (3,000); rice (1954) 270,000 (330,000 in 1948); wheat (1954-55) 2,100,000 (2,320,000 in 1953-54); maize (1954-55) 664,000; barley (1954-55) 279,000. Livestock (1952, standing estimate): horses 500,000; asses 1,000,000; mules 200,000; cattle 2,500,000; sheep 14,000,000; goats 6,000,000; camels 350,000; chickens 40,000,000.

Industry.—Production (census 1954-55): refined sugar 5,487 metric tons; cotton textiles 17,280,000 m. Electricity (Kabul and vicinity, 1954-55) 9,900,000 kw.hr. Total annual installed capacity 14,000 kw.

A. F. of L.: see LABOUR UNIONS.

Africa: see BRITISH EAST AFRICA; BRITISH SOUTH AFRICAN TERRITORIES; FRENCH UNION; PORTUGUESE OVERSEAS TERRITORIES; SPANISH COLONIAL EMPIRE; TRUST TERRITORIES; also articles on the various countries.

Agricultural Research Service. This agency conducts all of the U.S. department of agriculture's production and utilization research (except forestry research) and crops and livestock regulatory programs. Much of its work is co-operative with other federal, state or private agencies.

Crops Research.—A rare and little-known substance, gibberellic acid, offered unusual possibilities as a growth-regulating chemical. A single application of minute amounts doubled or tripled heights of various kinds of plants.

It was shown that two insects, the peach aphid and the potato aphid, can transmit internal cork virus from diseased to healthy sweet potatoes. A quick, positive way was found to check plant breeding lines and commercial varieties for their immunity or resistance to the disease.

Productive single-germ hybrids of the sugar beet were developed for the first time, giving promise of complete mechanization of sugar-beet production. A system of inheritance was discovered in castor beans that resembles, in effect, the male-sterility character used so successfully for breeding high-yielding and disease-resistant varieties of onions, sorghum, sugar beets and other crops.

A new systemic insecticide, Dow ET-57, administered orally in capsule form, showed promise for control of the cattle grub, but further investigations were needed.

An outstanding repellent was discovered that was highly effective against mosquitoes, stable flies, deer flies, ticks, fleas and chiggers.

The only nematode known to be beneficial to plants was found to transmit a bacterial disease that is highly destructive to several injurious insects, among them the codling moth, corn earworm and pink bollworm. Several virus diseases proved potentially capable of controlling tent caterpillars, corn earworm and cabbage looper. The Virginia pine sawfly was readily infected by a virus sprayed on pines by aeroplane.

Crops Regulatory Programs.—Within ten days following discovery on April 13, 1956, of the Mediterranean fruit fly, a destructive fruit and vegetable pest, in Florida, manpower and equipment were being mobilized for an all-out federal-state eradication effort. Two powerful new weapons, developed through U.S.D.A. research in Hawaii, were in use—an attractant bait-insecticide spray, and an effective lure for male flies eventually used in about 35,000 survey traps over the state.

Aircraft sprayed DDT on almost 1,000,000 ac. of land in ten northeastern states during the summer in a federal-state effort to halt the southerly advance of the gypsy moth and to cut down its numbers.

Plant quarantine inspectors intercepted at U.S. borders about 17,500 lots of material containing dangerous plant pests—insects, nematodes and diseases. For the past few years, passengers on 38% of the planes and 27% of the vessels had carried unauthorized plant material.

Livestock Research.—U.S.D.A.'s long-awaited, critically needed Plum Island (New York) Animal Disease laboratory, a \$10,000,000 research building, was dedicated in September. One strain of foot-and-mouth disease virus was propagated at Plum Island in cultures of kidney cells, affording an economical and controllable source of material for fundamental studies.

Seeking to develop meatier hogs, U.S.D.A. scientists found that Duroc and Yorkshire hogs selected for high backfat thickness by the probe method generally were shorter, lower and wider of body than those selected for low backfat thickness. By putting animals to sleep with certain anaesthetics, researchers were able to correlate length of their sleep with fat content. The shorter the sleep, the more fat. This unique method held potential significance in beef and pork marketing.

Feeding stilbestrol experimentally to dairy cows did not increase milk production or efficiency of feed utilization. Dairy herd improvement and sire-proving work was at its highest level in history, with more than 1,400,000 cows on Standard Dairy Herd Improvement association test. They had an average production of 9,363 lb. of milk and 372 lb. of butterfat, an all-time-high level of production. Daughters of proved sires averaged 10,236 lb. of milk and 415 lb. of butterfat, as against the national average for all cows of 5,815 lb. of milk and 232 lb. of butterfat.

Livestock Regulatory Programs.—The accelerated program to eradicate bovine brucellosis began to pay dividends. By June 1956, five states were certified as modified brucellosis-free, with about 20 others aiming for the same status in their dairy and beef cattle herds during the next five years. Incidence of the disease declined more than one-fifth during the first 18 months of the intensified campaign, with tests showing that less than 2% of all U.S. cattle remained infected. The fact that 89% of the reactors found were reported slaughtered showed that owners were becoming more convinced that it is unprofitable to permit brucellosis to remain in their herds.

Selected veterinarians, U.S.D.A.-trained in the differential diagnosis of vesicular diseases, were located strategically through-

out the country and placed on call 24 hours a day. They constituted a vital first line of defense against the dread foot-and-mouth disease—should it again invade the country—as well as against animal diseases already in the United States.

An animal disease reporting system was inaugurated in Jan. 1956 to collect and disseminate to veterinarians throughout the country information on occurrence of important animal diseases. This system proved a valuable aid in planning and directing animal disease eradication programs.

Utilization Research.—Potato flakes that form mashed potatoes when mixed with hot milk or water were market-tested, and a number of processors were considering commercial production. A new two-stage cooking procedure controlled texture of the product to meet geographical preferences and also made possible use of eastern potato varieties previously considered unsuitable. Research-developed equipment for superdrying dehydrated mashed potatoes was now used by all United States potato-granule manufacturers. Potato puffs and bars made from crushed potato chips were also developed.

A new treatment for making wool permanently shrink-resistant, even after repeated washings, chemically anchors small amounts of a resin to the wool structure. Evaluation of the process for commercial use was under way. Another new chemical treatment increases wool's resistance to acids and caustics without affecting its other characteristics. Research made progress in producing wool that is softer, better able to hold creases and pleats, less easily discoloured and more resistant to soil, moths and micro-organisms. A sound analyzer, the "rustleometer," helped to evaluate "handle" or feel, by which experts judge drape, softness, warmth and texture of wool fabric.

Home Economics Research.—An energy-saving kitchen workroom was designed for ill or aged housewives. It requires fewer steps, less reaching and standing.

A daily food plan developed for use in nutrition programs presented a four-food-group point system rating common foods as nutrient sources.

Certain nutrients consumed by people in specific age groups were studied to establish standards and spotlight deficiencies in nutrition—the amino-acid requirements of young women, children's requirements for fatty acids, and the milk- and variety-deficient meals of older low-income families.

Useful to both homes and institutions were studies on correct use of detergents in laundering, on properties and serviceability of household and clothing fabrics, on home freezers, on bread, on edible yields of market-purchased foods and on waste of fat beef from packing plant to dinner table to garbage can.

Farm and Land Management Research.—Agricultural engineers developed mechanical means of doing farm jobs more efficiently—among them a bladeless potato digger, a moisture-measuring instrument for use in drying grain, a seed reclaimer to reduce losses from shattering, electric insect traps and a cell for measuring pressures in soil.

New systems helped increase farming efficiency—corn "ridge farming" for humid areas, "land forming" for sugar cane fields, a three-team apple-picking method, and handling of apples in bulk boxes with fork-lift equipment.

A simplified hooded-pipe spillway was developed that was expected to save hundreds of thousands of dollars a year in dam and reservoir construction costs.

With drought still the primary agricultural problem in many areas, research on conserving soil and water assumed increasing importance. Plans were made for launching a nation-wide, three-year inventory of soil and water conservation needs, county by county. An analysis of 20 years' accumulated watershed data from 27 states, a nation-wide summary of soil and water loss data and studies of the frequency and intensity of droughts over

a 25-year period in several states were under way.

(See also CHEMISTRY.)

(B. T. S.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Antibiotics* (1952); *Atom and Agriculture* (1953); *Improved Strains of Livestock* (Applications of Genetic Principles) (1954); *Science and Agriculture* (1953).

Agriculture. Despite extensive acreage and marketing controls, a late, wet spring in the northeast, a severe and widespread drought in the Great Plains, and diversion of more than 12,000,000 ac. of cropland to the acreage reserve phase of the soil bank, early indications of crop reductions were mostly revised upward after midsummer, and 1956 proved to be a very productive agricultural year in the United States. Total crop production was only slightly below the record production of 1948. The wheat harvest was 975,517,000 bu., in spite of reduced acreage, marketing quotas and drought, 3% more than 1955 but 16% below the high average for the previous decade. The second largest corn crop on record of 3,412,183,000 bu. was produced on the smallest acreage harvested in the 20th century; corn did much to balance the smaller production of other feed grains. In spite of significantly smaller oat and barley crops and a sharply reduced grain sorghum crop of 169,815,000 bu., as compared with a record 241,100,000 bu. in 1955, total feed grain production was indicated at about 127,000,000 tons, only 2% below the big 1955 crop. The hay crop of 110,383,000 tons, the second largest of record, included an all-time high of 59,536,000 tons of alfalfa.

The new record soybean crop of 457,394,000 bu., 23% more than the previous record crop of 1955 and 80% above average for the previous decade, plus a linseed crop one-fourth larger than in 1955, did much to counterbalance an 8% reduction in peanuts and a 10% reduction in the cottonseed crop. Reduction of about 16% in the rice crop lessened surplus pressure.

Total deciduous fruit production was about 1% smaller than in 1955; the peach crop was notably improved. Tree nut crops were about 6% more plentiful than in the previous year. Larger vegetable crops than in 1955, especially of processing vegetables, did much to hold the line on food prices. The indicated white potato crop was 11% larger than in 1955, but sweet potatoes were about one-fifth less abundant than average. The sugar beet crop increased to a level 8% above 1955 and 18% above the average for 1945-54, but the sugar cane crop was reduced about 10% by unfavourable weather conditions in Louisiana. The tobacco crop of 2,124,767,000 lb., grown on 8% fewer acres than in 1955, provided some new record yields, especially of the important flue-cured type.

Livestock Production.—Livestock and poultry on U.S. farms and ranches at the beginning of the year showed a net increase of nearly 2%, as compared with 1955, but were 7% below the

Table I.—U.S. Production and Yield Per Acre

	1956*		1955	
	Yield	Production in thousands	Yield	Production in thousands
Field Crops				
Corn, bu.	44.0	3,412,183	40.6	3,241,536
Wheat, bu.	19.3	975,517	19.8	936,761
Oats, bu.	32.6	1,154,595	38.3	1,499,282
Barley, bu.	28.8	370,254	27.5	400,295
Rye, bu.	12.7	21,961	14.2	29,678
Flaxseed, bu.	9.1	51,948	8.3	41,258
Rice, bags (yield in lb.) . . .	2,885	46,225	2,931	53,532
Hay, all, tons	1.46	110,383	1.49	112,782
Beans, bags (yield in lb.) . . .	1,166	16,977	1,100	16,968
Soybeans, bu.	21.8	457,394	19.9	371,106
Peanuts, lb.	986	1,488,575	925	1,564,530
Potatoes, cwt.	174.2	244,150	160.6	227,046
Sweet potatoes, cwt.	58.0	16,634	61.4	20,946
Tobacco, lb.	1,540	2,124,767	1,467	2,195,788
Sugar beets, short tons	16.4	12,962	16.5	12,228
Colton, bales (yield in lb.) . .	403	13,303,000	417	14,721
Fruit Crops				
Apples, bu. . . . .	...	96,145	...	106,234
Peaches, bu. . . . .	...	68,285	...	51,827
Pears, bu. . . . .	...	32,307	...	29,622
Grapes, tons . . . . .	...	2,994	...	3,237
Oranges, boxes . . . . .	...	136,800	...	132,715
Grapefruit, boxes . . . . .	...	43,900	...	45,280

*Indicated figures.

record level of Jan. 1944. Meat animals (cattle, hogs and sheep) increased 2%, whereas milk cattle were down about 1%, poultry about 2%, and the now only slightly significant work stock were down 8%. Hogs and stock sheep declined in price per head and in total value, cattle showed little change, and other types showed some increase. Production rates for most products continued at record or near record levels.

Total cattle reached a new high level of 97,465,000 head at the beginning of the year, thus continuing the expansion phase of the cycle begun in 1949, and repeated for the sixth time since 1880. The increase was in beef cattle; milk cows declined to the second lowest level since 1930. The 1956 calf crop was indicated at 43,272,000 head, 1% more than the 43,001,000 calves born in 1955. Though cattle slaughter in the first half of 1956 averaged about 4% above the corresponding period of 1955, it included more steers, slightly more heifers and fewer cows. With no major liquidation of breeding cattle resulting from the Great Plains drought, it appeared that cattle numbers were near stability at a very high level, leaving open the important question of when the anticipated declining phase of the cycle might begin.

Milk production continued at a record high rate, the increased feeding of concentrates and improvement in quality of dairy stock outweighing the decline in dairy cow numbers.

Hogs, of which 55,088,000 head were on U.S. farms at the beginning of the year, as compared with 50,474,000 head a year earlier, declined during 1956. The 1956 spring pig crop totalled only 53,085,000 head, a decline of 8% from the spring of 1955. These, plus about 35,000,000 fall pigs, gave a total of about 88,000,000 as compared with 95,604,000 in 1955. The decrease resulted from a severe decline in hog prices in 1955 together with a continued unfavourable corn-hog price ratio which in September stood at 10.8 as compared with an average of 13.5 for the decade 1945-54.

Stock sheep on farms and ranches declined slightly to 27,009,000 head at the beginning of the year, from 27,137,000 a year earlier. However, the number of breeding ewes was somewhat increased and the 1956 lamb crop was indicated at 20,428,000, as compared with 20,187,000 in 1955. Shorn wool production of 232,000,000 lb. was 1% less than the 1955 clip, in spite of a government wool incentive payment of 44.9% of the average price received on the open market, bringing the total to about 62 cents per pound for grease wool. The same rate was announced for 1957.

About 382,218,000 chickens were on farms at the beginning of the year, as compared with 390,708,000 a year earlier. Turkeys also showed some decrease, to 4,892,000 head from 4,917,000 head. Broiler production continued in 1956 at a record level, exceeding 1955 by perhaps 20%. Egg production also exceeded that of 1955 by a small margin. Turkeys raised were 76,300,000 head, 10% more than the 65,600,000 of 1955. Heavy breeds were up 29% over the previous year, and light-breed birds down 19%.

Table II.—Index Numbers of U.S. Farm Output, Gross Production of Livestock and Crops, by Major Groups
(1947-49=100)

Item	1956 Indicated	1955	Average 1952-54
Farm Output	113	112	108
All livestock and products	123	121	115
Meat animals	126	127	116
Dairy products	111	108	105
Poultry and eggs	124	123	128
All Crops	106	105	102
Feed grains	110	111	102
Hay and forage	115	114	107
Food grains	81	80	95
Vegetables	105	100	98
Fruit and nuts	111	107	104
Sugar crops	112	110	106
Cotton	92	103	105
Tobacco	105	112	108
Oil crops	155	129	108

Source: Agricultural Research Service and Agricultural Marketing Service, U.S. Department of Agriculture.

In more than 600 counties the drought situation after mid-1956 became so serious that, in order to keep breeding herds intact, farmers were permitted to graze their livestock on land designated for the acreage reserve of the soil bank. In addition, government-held surplus feeds were provided under subsidy and transportation costs reduced.

Agricultural Stocks and Foreign Trade.—Stocks continued to be superabundant in 1956, though considerable progress was made in export.

The size of stocks may be in some degree surmised from the Commodity Credit corporation (CCC) holdings or commitments of \$8,257,308,000 total value on June 30, remaining after vigorous disposal efforts. In quantity terms, carry-over stocks included 1,022,000,000 bu. of wheat and 14,100,000 bales of cotton, amounting approximately to a large crop of each, with little apparent likelihood of major reduction in the year ahead. Corn carry-over was also at a record level of about 1,200,000,000 bu., but dairy products and fats and oils, formerly at worrisome levels, were much reduced; special sales of butter stocks were discontinued. The surplus of feed grains, other than corn, was somewhat reduced. Hogs, in substantial surplus early in the year, were cut back, but cattle remained at or near record levels. The CCC was authorized to buy up to 100,000,000 bu. additional of grain storage bin capacity. On balance, pressure for surplus disposal did not abate, but mounted during 1956. Distribution, sale at market prices, triangular arrangements, and an International Food Commodity board were proposed.

U.S. agricultural exports in 1955-56 were valued at \$3,475,000,000, a 10% increase over the \$3,145,000,000 of 1954-55. In quantity, shipments increased by 13%, to the third largest total since 1925. Grain and feed exports, spurred by winter damage in Europe and sales under public law 480, were increased by 33% over the previous year, to \$1,170,000,000. Wheat exports of 345,000,000 bu. were the largest in four years, and feed grain exports were a record 8,300,000 tons, 84% more than the 4,500,000 tons of 1954-55. Vegetable oils and oil-seed exports increased 32% to \$400,000,000; exports of 69,000,000 bu. of soybeans and 1,000,000,000 lb. of cottonseed and soybean oils set new records. Tobacco outgo increased by 24% to \$380,000,000; livestock products by 18% to \$545,000,000; and fruits and vegetables by 19% to \$325,000,000 (fresh oranges set a new record of 1,330,000,000 lb.); but cotton lagged seriously, declining by 55% to \$375,000,000, as compared with \$684,000,000 in 1954-55. Japan, the United Kingdom, Canada, the Netherlands, and western Germany were the best customers for U.S. agricultural surplus, taking nearly half of the total exports in 1955-56.

Agricultural exports under government programs accounted for about \$1,316,000,000, or 38% of the total, in 1955-56. Exports under title I of public law 480 were 3,599,287 metric tons. Barter contracts totalled approximately \$315,800,000, as compared with \$281,800,000 the previous year. Donations of surplus foods were 2,015,200,000 lb., about 95% more than in 1954-55. In the early part of fiscal 1956-57, farm exports were nearly 25% larger than for the same months of 1955.

Total agricultural imports in 1955-56 were valued at \$4,080,376,000, as compared with \$3,779,604,000 in 1954-55. Supplementary products were valued at \$1,581,128,000, of which sugar valued at \$440,524,000 was a major item. Coffee accounted for \$1,450,796,000, more than half of the complementary total of \$2,499,248,000, and rubber for another \$453,368,000. Increased imports of Polish ham and Japanese cotton textiles were widely controversial during 1956, as was cargo preference legislation on agricultural exports. Attempts to further restrict dairy products imports, especially some types of Italian cheeses, were overruled.

Farm Product Prices.—A five-year decline was interrupted by generally rising market prices for farm products during the first half of 1956, after which prices again dipped. The index of prices received, which stood at 223 in Dec. 1955 (1910-14=100), had by June 1956 rebounded to 247, which was, nevertheless, far below the record 313 of Feb. 1951. By October it had dipped to 234, causing no little concern as hog and crop marketings underwent the usual seasonal increase. Meanwhile, the index for food in the consumer price index in September rose to 113.1 (1947-49=100), as compared with 111.4 a year earlier, but was 3% below the Aug. 1952 peak level. The farmers' share of the retail food dollar increased slightly from the 39-cent average for the first quarter of 1956.

Farm Income.—Farmers received about \$17,100,000,000 from marketings in the first eight months of 1956, 2% more than in the corresponding period of 1955. Increase in the volume of marketings more than offset a 2% decline in average prices. Receipts from livestock and products were approximately \$10,400,000,000, slightly more than in 1955. Crop receipts of \$6,700,000,000 were up 3%, as compared with the same period of 1955.

Prices paid by farmers for commodities, interest, taxes and wages involved in farm production (the parity index) stood at 287 in October, as compared with 280 a year earlier, and a record high of 290 in May 1952. A few products, mostly those which some farmers purchase from other farmers, were less costly.

The parity ratio, which measures prices received in relation to costs sustained, stood at 82 in October, the same as a year earlier and compared with the record high, representing the most favourable condition for farmers, of 123 in Oct. 1946. It was preliminarily estimated that farmers' realized net income for 1956 would slightly exceed the \$11,700,000,000 of 1955; the peak was \$16,774,000,000 in 1947.

Farm Values and Finances.—Somewhat paradoxically, in view of the recession in farm income, demand for farm land continued strong in 1956. The annual removal of more than 1,000,000 ac. of land from agricultural to industrial, residential and road uses contributed to the demand. The average value of U.S. farms in July was 3% higher than a year earlier, rising to a new record high of 140% of the 1947-49 base. Total estimated value of land and building in March was \$102,412,000,000, up from \$98,500,000,000 in 1955; buildings accounted for \$24,293,000,000. The average per acre value was \$88.40, as compared with \$85 a year previous. The value of all farm assets in the U.S. stood at an all-time peak of \$170,100,000,000 at the beginning of 1956. The increase from Jan. 1, 1955, of \$3,600,000,000 or 2% was accounted for by an increase in farm real estate from \$98,800,000,000 to \$102,700,000,000. Though much of this was, strictly speaking, a book value tied to the farm real estate market, proprietors' equities were \$151,300,000,000, as compared with \$148,800,000,000 a year earlier.

Total farm mortgage debt outstanding at the beginning of the year was estimated at \$8,962,000,000, the highest since 1932 and the tenth consecutive year of increase, up 10% from a year earlier. The increase was estimated at a somewhat lower rate during 1956. Interest rates averaged 4.8%, slightly higher than a year earlier.

Short-term credit, including CCC loans, also was used in larger amounts, the non-real estate debt rising to \$7,900,000,000 as of Jan. 1, 1956, up 8% as compared with a year earlier.

Farm Labour.—About 10,428,000 persons were working on U.S. farms during the autumn harvest of 1956, 4% fewer than a year earlier. The number of hired workers, 2,926,000, was slightly larger than in 1955, the over-all decrease being entirely accounted for by fewer family workers. Farm wage rates averaged 5% higher than a year earlier. The average wage of hired labour was \$6 per day without board or room for a workday of about



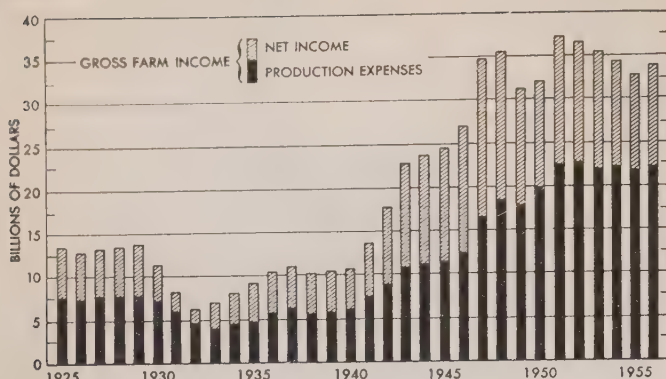
CRUSHED ICE being sprayed on young cotton plants, the first step in a study of hail damage to cotton crops, an experiment conducted in 1956 by Texas A. & M. college. Results indicated that farmers did not need to plow under and replant if hail strikes the crop early in its growth

nine hours, or \$161 per month with house.

Farm Costs—Machinery, Fertilizer, Taxes, etc.—Prices paid by farmers for industrial commodities, farm wage rates, taxes and interest were higher in 1956, whereas prices paid for feed, seed and livestock, though lower, tended to increase as the year advanced, the parity index advancing from 279 in Dec. 1955 to 287 in Oct. 1956. Small chance of a decline in costs, to offset depressed income, was foreseen.

Farm machinery shipments were about 15% below 1955 in dollar value. Farm machinery prices, 4% higher in March 1956 than a year earlier, were generally increased later in the year because of rising costs. Meanwhile, it became increasingly evident that mechanization of agriculture had resulted in some problems, particularly with respect to capital requirements and debt as well as efficient unit size of operation. Electric power, a cash expense, turned to profitable use on many farms, was reported as available to nearly 95% of U.S. farms.

Fertilizer costs were down about 2%, as compared with the previous year. Yet the post-World War II boom in fertilizer use, which increased consumption in 1955 to record levels nearly 4%



GROSS FARM INCOME: net income and production expenses of U.S. farm operators, 1925-56, including government payments from 1933. Compiled by U.S. bureau of agricultural economics. Data for 1956 are estimates

over the previous year, was reported as fading, with some producers cutting output as sales showed a larger than seasonal dip. The use of higher-analysis fertilizers continued to increase. Agricultural chemicals used were valued at perhaps \$200,000,000 at the manufacturer's level.

Interest paid by farmers increased by 7% as compared with 1954, to \$950,000,000 in 1955; a larger rise was indicated for 1956 as a result of increased borrowing and higher interest rates. Property taxes paid by farmers to state and local governments were indicated as at least 3% higher than in 1955, when levies totalled about \$927,000,000. Taxes payable by farmers on employees in 1956 were indicated as about three times as high as in any previous year—a result of increased coverage of hired farm workers under the federal old age and survivors program.

Commodity Credit Corporation.—Price supports extended on 1955 crops through June 30, 1956, were about 20% larger than for the previous year; of the total of \$3,519,000,000 loans were \$2,967,959,115, purchase agreements \$288,211,271 and purchases of commodities not under purchase agreements amounted to \$262,844,271. Leading items among 1955 crops supported, in order of value, were: cotton, 7,200,000 bales and \$1,177,200,000; wheat, 320,000,000 bu. and \$656,900,000; corn, 420,700,000 bu. and \$650,900,000; tobacco, 364,400,000 lb. and \$241,000,000; and rice, 26,300,000 cwt. and \$139,100,000. Of the more significant 1955 crops, 49.1% of the rice, 49% of the cotton, 44.1% of the grain sorghums, 42.7% of the rye, 34.1% of the wheat, 23.9% of the barley, 20.8% of the flaxseed, 20.5% of the beans, and 13% of the corn, were extended support.

The net realized program loss on price-support operations for the fiscal year ended June 30, 1956, was \$974,767,365, as compared with \$799,061,464 for the previous fiscal year. Including some other items, the resulting net loss from operations, expenses and increases to reserves totalled \$1,335,782,753.

In addition, the Commodity Credit corporation was reimbursed in full for surplus commodities valued at \$459,281,096 disposed of in fiscal 1956 under titles I and II of public law 480, the Agricultural Trade Development and Assistance act of 1954.

Total investment in commodities in price-support inventory or pledged for outstanding loans at the end of fiscal 1956 was \$8,257,308,000, as compared with \$7,069,277,000 a year earlier. The borrowing power of the CCC on Aug. 1 was increased to \$14,500,000,000 from \$12,000,000,000, by public law 864. As of April, nearly all of the \$12,000,000,000 was pledged. In the autumn of 1956, it appeared that record amounts of corn, soybeans and cotton would seek shelter under the support program.

Legislation and Administration.—Even before the second session of the 84th congress began in Jan. 1956, it was indicated that the agricultural situation had become sufficiently critical, economically and politically, to guarantee major remedial at-

tention. The program as finally enacted was in its general emphasis fairly close to what had been requested by the administration.

The Agricultural act of 1956 approved May 28, provided for a soil bank in two phases. The Acreage Reserve program authorized payments to farmers for reducing production of the six basic crops, by reducing crop acreage below the farm acreage allotment. This program, voluntary in nature except for corn, was to begin with 1956 and extend through 1959. Over-all limits on the program were set at \$750,000,000 per year with specified limits for each commodity. Civil penalties were imposed for violation of prohibition against cropping or grazing. Corn constituted a special case in 1956, with a referendum vote of farmers to be held late in 1956 to determine the nature of the program for subsequent years.

This part of the program got under way on June 8, and about 12,300,000 ac. were contracted. Corn farmers signed 270,161 agreements covering 5,450,194 ac., with maximum possible payments of \$180,629,284; wheat farmers, 162,574 agreements covering 5,654,507 ac. for possible payments of \$44,490,882; cotton farmers, 95,954 agreements on 1,113,789 ac. for a possible \$27,281,778 payment; tobacco farmers, 19,994 agreements covering 31,671 ac. for possible payments of \$6,618,699; peanut growers, 5,303 agreements on 43,645 ac. for a possible \$591,437 payment; rice growers, 1,112 agreements on 28,003 ac. for possible payments of \$1,386,667. The grazing restriction was removed later in the year on many reserve acres in drought-stricken areas. Approximately 10,000,000 ac. of winter wheat acreage were contracted for the 1957 reserve.

The second phase, the conservation reserve, was not officially opened until Aug. 16, and was expected to apply mostly to years after 1956. The secretary of agriculture was authorized to enter into contracts with agricultural producers, not restricted to producers of the basic crops, for a minimum period of three years and a maximum period of ten years (15 years in the case of tree cover), under which the producer would devote a designated part of his crop land to conserving uses, trees, grass or water facilities, agreeing not to pasture or harvest any crop therefrom except under certain emergency conditions. The secretary, in turn, would agree to pay a fair share of the costs of establishing the conservation use and, in addition, make an annual payment to the producer to provide a fair and reasonable annual return for the land diverted to conservation uses, with an over-all limit on the program of \$450,000,000.

In addition, the Agricultural act of 1956 raised support levels on several 1956 feed grains from the previously announced 70% of parity to 76% of parity; froze the 1957 and 1958 national acreage allotments for cotton at no less than the 1956 allotment; froze transitional parity for the basic commodities for 1957; set rice acreage allotments for 1956 at no less than 85% of 1955, and held 1957 and 1958 allotments at the 1956 level; authorized an expanded sec. 32 program, particularly for perishable commodities, with \$500,000,000 to be appropriated annually with limitation of 50% on the amount of such funds which may be used for any one commodity; directed the CCC to sell cotton at prices at which cottons of comparable qualities are offered down to a "comparable minimum of 25.5 cents per lb."

Drought, Flood and Famine.—The U.S. did not escape natural disaster in 1956. Most severe in its results was the continuation and intensification of the drought in the Great Plains: wind and dust damage in some areas was more severe than in the 1930s, spreading even to Iowa, and involving nearly 700 counties and half the farm land west of the Mississippi in one or another of the relief programs initiated by the federal government acting in conjunction with state and local agencies. A Great Plains Conservation program was legislated in July, authorizing \$150,000,-



"CONSERVATION CITY," site of the 1956 national field days and plowing matches near Colfax, Ia. Both major U.S. presidential candidates addressed assemblies at this site during the election campaign

ooo over a 10-year period, mostly to convert marginal crop land to pasture.

Floods in Pennsylvania and some other parts of the northeast, plus delay in seeding and early frost, lessened production and quality in that area. Winter vegetables and citrus fruits were damaged in Florida and other parts of the south in January. A flood insurance program got under way in 1956.

In other countries intense winter frost of nearly a month's duration and gales lashed western Europe early in 1956, resulting in hundreds of deaths, great damage, perhaps \$2,000,000,000 in total, with some crops, especially wheat and olives, hard hit. One result was much increased shipment, from North America, of grains and edible fats and oils.

Drought with food shortages in parts of Andean South America, and in Pakistan, were noted as were reports of famine and floods in Red China. There were some food riots, especially in Poland.

Canada.—Canadian farmers in 1956 reaped abundant harvests in the face of a tightening cost-price squeeze not unlike that confronting U.S. farmers. Though spring sowing of some major crops was delayed and quality of the harvest somewhat lowered by rain and frost, agriculture experienced a highly productive year. The wheat crop was indicated at 535,000,000 bu., higher than the 494,116,000 bu. of 1955, or the previous 10-year average of 463,659,000 bu., but far less than the record 702,000,000 bu. of 1952. Oat production was indicated at 535,000,000 bu. against 403,835,000 bu. in 1955; flaxseed at 34,057,000 bu., as compared with 19,748,000 bu. in the previous year. Rye was down to 8,600,000 bu. from 14,744,000 bu. in 1955. Fruit crops were generally smaller than in 1955, apples (11,600,000 bu.) only three-fifths as productive as in the previous year.

Total Canadian grain stocks on July 1 prior to the new harvest were estimated at 22,959,000 short tons, as compared with 20,708,000 short tons a year earlier and 25,569,000 short tons in 1954. Wheat stocks of 560,000,000 bu. were particularly abundant in relation to annual domestic consumption of about 160,000,000 bu. but only moderately in excess of the 530,000,000 bu.

of July 1955 and below the 615,000,000 bu. carry-over of July 1954. Wheat and wheat flour exports increased to 309,000,000 bu. in the 1955-56 marketing year (August-July), as compared with 252,000,000 bu. the previous year. A Canadian-U.S.S.R. trade agreement, signed in February 1956, called for the U.S.S.R. to take a minimum of 400,000 tons (nearly 15,000,000 bu.) of wheat each year for three years.

The government continued its price-support programs on several of the more important agricultural products. In addition, it initiated short-term farm loans up to \$1,500 on grain stored on farms, stepped up financial payment on some previous wheat crops and introduced government payment of grain storage costs.

Latin America and Southern Hemisphere.—Latin-American agriculture in 1956 made substantial gains. Argentina's agricultural exports were expected to equal in value those of 1955, in spite of a big decline in wheat, normally a major item of surplus. Increases were noted in corn, in meat and in livestock products, including wool. Though about \$25,000,000 worth of fats and oils were purchased from the U.S. earlier in the year, the oilseed harvest provided a significant export surplus, especially of sunflower. Brazil, faced with a mounting coffee surplus, utilized controls effectively; but, in view of a serious cost-of-living situation, took steps to increase production, even by having the army raise its supplies, to control prices and improve the transportation of foodstuffs. Chile, using international experts as advisors, also made a firm attack on the inflation problem by establishing export quotas, increasing the wheat price support by 50%, fixing the price of bread and increasing contributions to family allowance funds. Bolivia, with a severe drought in the highlands, maintained a precarious equilibrium while attempting monetary stabilization, mostly by benefit of food stocks and technical assistance, in total about \$23,000,000, provided by the U.S. A severe drought in Peru also reduced domestically produced food supplies. Middle America benefited from the tight supply-demand situation with respect to mild types of coffee and from firm sugar markets. Mexico increased its exports of agricultural commodities, meanwhile managing to hold the line on imports. It found U.S. efforts to export larger amounts of cotton disturbing, reduced its own cotton plantings, and for a time put retaliatory measures into effect.

The southern hemisphere, especially Australia and New Zealand, protested U.S. export policies as "farm surplus dumping." They, too, had generally favourable production, and wool exports were large, but concern was expressed about their European markets, also about the wheat market in India. Africa in general continued in an era of prosperity and agricultural expansion, except for a few crops such as cocoa. South Africa had accumulated some refractory surpluses in spite of losses from drought, and experienced the now almost universal cost-price squeeze.

Western Europe.—Overall, farmers in this area experienced the most difficult season since 1947. A long and severe winter freeze did great damage, especially to wheat in France, and to citrus, nut and olive production in the western Mediterranean area. Losses, not all agricultural, were estimated as high as \$2,000,000,000. The area continued to be the world's major import area for agricultural products.

The United Kingdom continued to be the world's largest import market for meat and livestock products. Average daily caloric consumption per person continued above 3,100, in spite of the fact that food prices rose more sharply than other consumer prices. The declared intention to cut agricultural subsidies was abandoned. The year's subsidy bill at £215,000,000 was a bit lower than had been anticipated and farming costs were up by £35,000,000 on products covered. Increased subsidies of £25,000,000, rearranged rather drastically among products, followed the trend of increase in number and value of direct subsidies paid to producers.

In the Netherlands, work was started on the first mattress in the Haringvliet, one of the three big inlets to be cut off from the sea, in a 25-year project to reclaim as much as 37,000 ac. at a cost of about 2,000,000,000 guilders.

Finnish farmers engaged in a retaliatory four-day stoppage of food deliveries in March after a general strike was ordered by the Trade Union federation. In May, parliament sanctioned an agricultural price bill in which agricultural income was based on the price and cost level of Feb. 1956.

West Germany's harvest was reported as approximating that of 1955 with fodder and industrial grains increased and bread grains reduced. The cost-price squeeze worsened, resulting in an annual 3% drop in farm workers and rumblings of complaint. The parliament approved a plan to ease farm costs by extending to farmers 1,000,000,000 marks in direct aid and noninterest-bearing credits.

France reported a very short wheat crop and a much expanded barley harvest. An extensive farm strike in May was used to buttress demands for more aid. Spain absorbed rather large amounts of U.S. surplus agricultural products as did Austria. Italy reported a satisfactory year in general and an exceptionally good wheat year.

Middle East and India.—Much of this diverse area experienced comparatively favourable production conditions in 1956 and, as a result, supplied more of its own needs. The wheat crop was a large one in many areas. Turkey reported larger crops of pistachio nuts and almonds as well as a bumper crop of filberts. The wheat crop of 240,000,000 bu. was large, but not quite so large as the record 260,000,000 bu. of 1955. Egypt's cotton crop was as large as that of 1955 and more of it was of superior long-staple lengths; the wheat crop of 56,840,000 bu. was a large one. Syria had a wheat crop of 32,150,000 bu., as compared with only 22,040,000 bu. in 1955; that of Iraq increased to 27,550,000 bu., against 17,390,000 bu. in 1955. Iran had a record large raisin crop and a large rice crop. Pakistan experienced famine and food riots in the late spring, but the wheat harvest was a favourable one of 126,934,000 bu., as compared with 118,420,000 bu. in 1955. A draft of the first five-year plan was released calling for a 13%



"HORN OF OUR DILEMMA," a cartoon of 1956 by Haynie of the *Greensboro Daily News* (N.C.)

increase in production of food grains and large increases in some other crops, and a large expansion by 1,174,000 ac. of land under irrigation by 1960.

India reported over-all improvement by the close of its first five-year effort in June 1956, yet agricultural output for 1956 was estimated at 65,800,000 tons, or about 2,900,000 tons less than in 1954. The plan for the next five years called for an 18% increase in farm production. In August it was announced that the largest agreement ever negotiated for the sale of U.S. agricultural commodities under public law 480 had been reached with India, for a total of \$360,100,000 (cost to the CCC, \$652,300,000), including \$200,000,000 worth of wheat (130,000,000 bu.); \$70,000,000 worth of cotton (500,000 bales); \$26,400,000 worth of rice; \$6,000,000 worth of tobacco and \$3,500,000 worth of dairy products.

Eastern Europe and the U.S.S.R.—The agricultural situation in the Iron Curtain countries continued in 1956 to present several imponderables. Official statements and travellers' accounts were far from agreement as to the facts or their proper interpretation. There was little official assistance to the outside world in its attempts at an understanding. True, the first Soviet statistical handbook since 1939 was published. But with respect to crop production, the new publication restricted itself to a simple table showing percentage increase of grain, cotton and other crops from 1950 to 1955, without revealing the bases on which the percentages were computed.

Late in Dec. 1955 there were official denials of a food crisis, following what appeared to be near failure in the new lands program in 1955 when hoped for rains did not come. Yet western observers were hardly prepared to understand the grain target for 1960 under the sixth plan, which was set at 180,000,000 tons, a figure previously published for 1955. Shortly thereafter, Nikita S. Khrushchev strongly denounced bureaucrats in farming, and there were indications that the virgin lands program would not be expanded beyond the target of 30,000,000 hectares (74,130,000 ac.) to be sown by the end of 1956.

Spring crops were reported as off to a poor start, and in April

Table III.—Index Numbers of Volume of Food Production

Region	(Prewar average=100) Total food production			Per capita food production		
	1955-56*	1954-55	Average 1948-49 to 1952-53	1955-56*	1954-55	Average, 1948-49 to 1952-53
Western Europe	125	124	107	109	109	97
North America	158	150	141	121	117	118
Latin America	142	141	125	94	95	93
Oceania	127	121	112	93	91	93
Far East (excluding China)	119	116	104	92	91	86
Near East	139	141	120	106	109	99
Africa	140	143	125	106	110	103
World†	126	123	110	104	102	96

*Preliminary, †including estimates for the U.S.S.R., eastern Europe and China.

Source: United Nations Food and Agriculture Organization, *The State of Food and Agriculture, 1956* (Rome, 1956).

there was a new official appeal to farmers to spur output. By late July, Moscow expected a record harvest, particularly from the virgin lands of Siberia. But by early autumn much of a fine crop was reported yet unharvested and in peril because of weather.

Following the investigations of U.S. corn production in 1955 by an official delegation from the U.S.S.R., substantial amounts of hybrid seed corn were purchased. Intentions to plant 7,000,000 hectares (17,297,000 ac.) to corn in 1956 were indicated, as compared with only 2,000,000 hectares (4,942,000 ac.) in 1954.

A project to increase irrigated cotton acreage by some 647,000 ac. was announced, to be completed by 1962.

It was generally believed that the riots in Poznan, Pol., in June 1956 were in some degree bread riots, following a bitter winter. Yet, U.S. offers of free food were rejected, with the observation that gifts or charity could not be accepted. But Polish authorities said that they would like to purchase grain on the basis of equality with other nations, meaning, possibly, under public law 480 for local currencies. Some grains were purchased on credit from Canada.

Far East.—The situation in the far east during 1956 remained unclear, but spring famine was reported from Red China and North Korea. Nevertheless, later in the year an increase in food rations was reported for some groups in North Korea. August floods damaged thousands of acres of farm crops as far north as Harbin. About 60% of the peasant households in Red China were reported as recent members of the land-pooling agricultural producer collectives, with prospects that this halfway status might be virtually completed during 1956. In April it was announced that China had been a large purchaser of Egyptian cotton.

The agriculture of the Republic of Korea continued to be a bright spot in that economy. That area and Japan continued to absorb quantities of U.S. agricultural surplus, especially cotton, wheat, barley and soybeans; yet Japan found it increasingly difficult to market its cotton textiles in world markets. The crop production was favourable, but not up to the record year 1955.

Philippine production of coconut products increased, with larger movement into the export market. Production of flue-cured tobacco increased to a level more than twofold that of the previous year. Thailand, with a balanced budget and a program of agricultural expansion and diversification, exported 605,000,000 lb. of rice in the first half of 1956 at sharply higher prices. Exports to Japan declined; those to Indonesia were heavy. Indonesia purchased \$91,800,000 worth of U.S. agricultural surplus under public law 480, including 550,000,000 lb. of rice, 206,000 bales of cotton, and some leaf tobacco and wheat flour. The five-year plan was concerned primarily with the production of required food and fibre for its 82,000,000 persons on its many small farms. Burma exported its rice surplus of about 1,900,000 long tons, the largest amount to move in postwar years. Japan was the largest recipient, but about 12% was exported to "iron curtain" countries.

International Organizations.—In March, Philip V. Cardon of the U.S. resigned, because of ill health, as director general of

the 72-nation Food and Agriculture organization (FAO) of the United Nations. Sir Herbert Broadley became acting chief, and B. R. Sen of India was elected to the post in September.

The International Wheat Agreement of 1956, after prolonged discussions, was formulated at the UN Wheat conference in Geneva, Switz., which concluded in April, after which it remained open for signature through May 18 and was signed by plenipotentiaries of 40 governments, including the U.S. and 5 other exporting countries and 34 importing countries.

The International Federation of Agricultural Producers, representing 35,000,000 farm families in 26 countries, announced its ninth general conference would be held at Purdue university, West Lafayette, Ind., in May 1957.

The United Nations Sugar conference, convened in May in New York city and continued at Geneva in October, considered mostly quotas and prices.

(See also AGRICULTURAL RESEARCH SERVICE; BUDGET, NATIONAL; CENSUS DATA, U.S.; FARM CREDIT SYSTEM; FRUIT; HORTICULTURE; IRRIGATION; LIVESTOCK; METEOROLOGY; PRICES; SOIL CONSERVATION; VEGETABLES; etc.; and also under principal crops.) (J. K. R.)

ENCYCLOPEDIA BRITANNICA FILMS.—*Atom and Agriculture* (1953); *Corn Farmer* (1939); *Irrigation Farming* (1951); *Production of Foods* (1946); *Science and Agriculture* (1953); *Truck Farmer* (1954); *Wheat Farmer* (1956).

Agriculture, U.S. Department of: see GOVERNMENT DEPARTMENTS AND BUREAUS, U.S.

Aircraft Manufacture. The year 1956 could be called the year of the turbine transport in the aircraft manufacturing industry of the United States; for, although such planes had been in development for some time, it was during 1956 that orders for three types of pure jet and two types of turboprop transports started pouring in. The five types under development and in production included the Boeing 707, the Douglas DC-8, the Convair 880 Golden Arrow (all jets) and the turboprop Lockheed Electra and Fairchild Friendship, the latter a medium-range plane designed by the Dutch Fokker company and licensed to Fairchild Engine and Airplane corporation for U.S. production.

The three jets and the Electra were all scheduled to start in air line service in 1959; the Friendship was slated for use in late 1957. By the end of 1956, only the Boeing 707, the first jet transport of the United States, and the Friendship had completed first flights.

Meanwhile, however, the demand for piston-engine air liners continued to be strong. A third-quarter report showed that U.S. transport manufacturers still had orders for more than 500 piston-powered air liners, chiefly the Douglas DC-6 and DC-7, the various versions of the Lockheed Constellation and the Convair 440. More than 50 air lines had placed orders for these planes.

In all, including piston and turbine-powered transports, the aircraft manufacturing industry boasted a backlog, as of Oct. 1956, of about \$1,200,000,000, by far the largest nonmilitary backlog the industry had ever seen.

Military production made up the bulk of the industry's business. As the air force approached its authorized strength of 137 wings, the industry was gradually "transitioning" from the build-up rate to the sustaining rate, bringing about a gradual decline in volume. The Aircraft Industries association estimated that military production for 1956 would amount to about 7,800 units, down from 8,400 planes the previous year. In addition, the association estimated that the industry would turn out 4,500 utility aircraft and more than 150 air line transports, an over-all production of about 12,450 aeroplanes. This compared with 13,153 in 1955.

The decline in production was not expected to affect materially the industry's sales position, although a slight drop was anticipated. The Aircraft Industries association estimated that 1956 sales would total slightly more than \$8,000,000,000 compared with \$8,500,000,000 in 1955 and \$8,300,000,000 in 1954. Although a greater decline might have been expected, to match the drop in production figures, two trends changed the balance: the increasing complexity of aircraft with heavily stressed air frames and new electronic equipment pushed the unit price upward; and guided missiles, not reflected in the unit inventory because of security, contributed more and more to sales volume as new missiles were readied for production. There were 7 missiles in operational status and about 20 in various stages of production, late in 1956.

Despite the drop in production units, air frame weight, an industry yardstick, was expected to be higher in 1956 because of a greater emphasis on the massive Boeing B-52 and the increasing weight of fighter aircraft. The Aircraft Industries association estimated that the 1956 air frame weight produced would be closer to 1954's 140,000,000 lb. than to 1955's 124,200,000 lb. (these figures include military and civil aircraft, but not missiles).

The industry's profit margin was expected to remain at its 1954 and 1955 levels, which was slightly less than 4% of sales. The figure would be somewhat lower for the companies engaged in turbine transport manufacture, since they would have to divert some of their profits to tooling and materials for the new planes.

Although employment in the air frame and engine industry had been expected to drop as the military authorized goals were neared, the upsurge in guided missile production and in civil airplane production had raised employment from 764,100 at the end of 1955 to 773,067 by mid-1956; and it was expected to reach 780,000 by the end of the year.

Major aircraft types in production at the end of 1956 included Boeing Airplane company's eight-jet B-52 bomber and KC-135 aerial refuelling tanker (military version of the model 707 jet transport); Convair's F-102A all-weather interceptor and the TF-102A, the trainer version; Douglas Aircraft's B-66B and RB-66B air force jet bombers and the giant C-133A turbine-powered cargo transport built for the U.S. air force; Fairchild Aircraft division's C-123B assault transport (U.S.A.F.); Grumman Aircraft Engineering's F9F and F11F series of navy shipboard jet fighters; the Lockheed F-104 air force interceptor,

fastest plane in the military inventory, and Lockheed's C-130 turboprop transport; the Glenn L. Martin company's P6M Seamaster water-based bomber; North American Aviation's F-100 series of air force interceptors; Chance Vought Aircraft's F8U navy supersonic interceptor; and McDonnell's F-101 air force long-range interceptor.

Principal engine types in production status included Pratt & Whitney's 10,000-lb.-thrust J-57 and 15,000-lb.-thrust J-75; General Electric's J-79, power plant for the Lockheed F-104, rated at 15,000 lb.; Curtiss-Wright's J-65; and the turboprops T-56 and model 501 being built by Allison division of General Motors Corp.

(See also AVIATION, CIVIL; AVIATION, MILITARY; JET PROPULSION; MUNITIONS.) (J. J. Hy.)

Air Crashes: see DISASTERS.

Air Force, U.S. Department of: see GOVERNMENT DEPARTMENTS AND BUREAUS, U.S.

Air Forces of the World: see AVIATION, MILITARY.

Air Mail: see POST OFFICE.

Air Pollution: see PUBLIC HEALTH ENGINEERING.

Airports and Flying Fields: see CIVIL AERONAUTICS ADMINISTRATION.

Air Races and Records.

Lieut. Col. Frank K. (Pete) Everest of the United States air force flew a Bell X-2 to a new world speed record of approximately 1,900 m.p.h. late in July 1956. The air force announcement of Aug. 2 told how the swept-wing plane, powered with a Curtiss-Wright rocket engine, had been carried aloft under a B-50 and then released for its test run at Edwards air force base, Calif. The previous mark was 1,650 m.p.h., established by Maj. Charles Yeager on Dec. 12, 1953. The official speed record for planes taking off under their own power is 1,132 m.p.h., made by Peter Twiss of Britain on March 10, 1956. Twiss achieved his feat in a Fairey Delta II. Lockheed F-104s had achieved 1,400 m.p.h., but not in flights under the official international rules that cover speed tests from conventional take-offs.

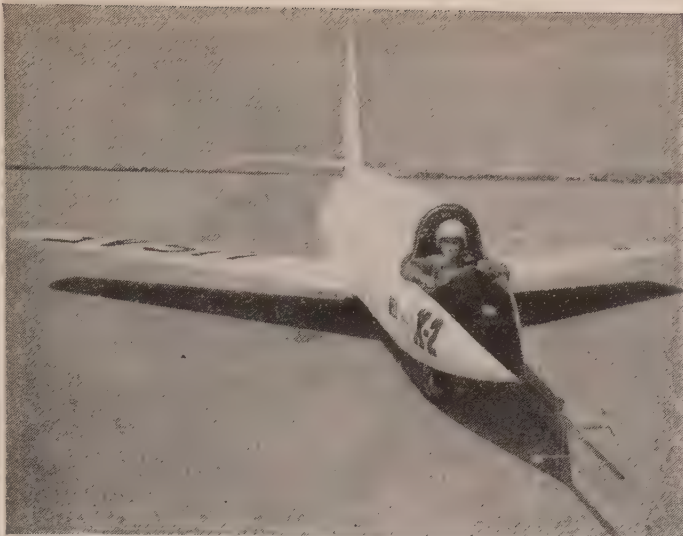
Early in September, the Bell X-2 soared to about 126,000 ft., or almost 24 mi., for a new altitude mark. The pilot on the record-breaking climb was Capt. I. C. Kincheloe. The former standard of 90,000 ft. was set by Maj. Arthur Murray in a Bell X-1A in 1954. The great performances of this Bell X-2 came to an end on Sept. 27, 1956, when the plane crashed over the Mojave desert, killing its pilot Capt. Milburn G. Apt of Buffalo, Kan.

The Bendix trophy race was among the features of the National Aircraft show at Oklahoma City, Okla., Sept. 1-3. A new mark for the event was set when Capt. Manuel J. Fernandez, Jr., triumphed at an average speed of 666.661 m.p.h. Six planes, all North American F-100C Super Sabre jets, made the 1,120-mi. flight from George air force base in California to the Will Rogers base, where the show was held. Capt. Fernandez was timed in 1 hr. 40 min. 38.8 sec. All six contestants broke the former record of 616.208 m.p.h. that had been set by Capt. E. F. Kenny in the race from Edwards base to Dayton, O., in 1954. Capt. Robert A. Madden was a close second to Fernandez with an average of 656.250 m.p.h.

In the North American race on Sept. 1, four navy pilots from Moffet field, Calif., took part in an FJ-3 Fury jet race from the carrier "Shangri-La," standing in the Pacific off Mexico, to Rogers field. The victor was Lieut.(j.g.) David K. Grosshuesch, who averaged 537.849 m.p.h. The B-47 jet event for the General Electric trophy marked the second day of the show. Flying from Bermuda to Oklahoma City in the elapsed time of 3 hr. 8 min. 43.6 sec., Maj. Joseph Schreiber of the 22nd bomb wing, March air force base, Calif., was the winner. He averaged 601.187 m.p.h.



TEST SECTION of supersonic wind tunnel opened at Lewis Flight Propulsion laboratory, Cleveland, O., in 1956. Designed to test both full-sized and scale models of ramjet, turbojet and other engines for supersonic aircraft and missiles, the tunnel had a Mach number range from 2.0 to 3.5 and could simulate altitudes as high as 160,000 ft. The photo shows a 16-in. ramjet being elevated into position for testing



BELL X-2 ROCKET PLANE which was flown at a world-record speed of about 1,900 m.p.h. in July 1956. During a later trial flight the plane crashed with another pilot, who was killed

A close second was Lieut. Col. John C. Lewis of Barksdale air force base in Louisiana. His speed was 600.058 m.p.h. and his elapsed time was 3 hr. 9 min. 4.9 sec. In the McDonnell F3H Demon race from the "Shangri-La" off San Francisco, Lieut. (j.g.) Ralph Carson of navy fighter squadron 124 of Miramar, Calif., was first. He averaged 566.007 m.p.h. and had an elapsed time of 2 hr. 32 min. 13.45 sec. for the 1,436-mi. flight.

The announcement Sept. 3 of a new national speed record of 1,015.428 m.p.h. marked the closing day of the show. The mark was made by Comdr. Robert W. (Duke) Windsor on Aug. 21 and was the first time the United States record for planes taking off under their own power had surpassed 1,000 m.p.h. Commander Windsor flew the navy's fighter, a Chance Vought F8U (Crusader. As a result of his feat over the Mojave desert near China Lake, Calif., Commander Windsor won the Thompson trophy for 1956.

A Bell H-13 helicopter, aloft since the first day of the show, set a new world helicopter endurance record of 57 hr. 50 min. An H-21 helicopter made the first nonstop transcontinental flight in August, flying 2,610 mi. from San Diego, Calif., to Washington, D.C., in 31 hr. 40 min. The Douglas trophy event, a race for navy planes from the "Shangri-La" off Oregon, was taken by a crew led by Capt. J. Blackburn. The Douglas A3D Skywarrior from the navy squadron at Jacksonville, Fla., triumphed with an average speed of 606.557 m.p.h. The Allison trophy again was won by the Webb air force base ground crew from Big Spring, Tex. The team, headed by Staff Sgt. Eugene F. Bleckler, made an engine change in the record time of 8 min. 18.8 sec. The three-day show attracted more than 191,000 spectators.

Air force Col. Horace A. Hanes, for his record flight of 822.135 m.p.h. of 1955, received the de la Vaulx medal of the International Aeronautic federation and the Mackay trophy. The 11th bombardment wing from Carswell air force base at Fort Worth, Tex., won the Muri S. Fairchild trophy. The prize is a symbol of the air force bombing championship.

Two bombers flew cross-country at an average speed of 670 m.p.h. on Feb. 26, but the time was not confirmed then as a new record. The recognized cross-country mark was set by Lieut. Col. Robert R. Scott of Des Moines, Ia, on March 9, 1955, when three United States air force F84F jets all improved on the then existing standard. Lieut. Col. Scott, first to finish, established the new record with an estimated average of 652 m.p.h. and an elapsed time of 3 hr. 44 min. 53 sec. on the flight from Los Angeles to New York.

Top prize in the tenth annual All-Woman Transcontinental Air race from San Mateo, Calif., to Flint, Mich., was taken by the California sister team of Mrs. Frances Bera, Los Angeles, and Mrs. Edna Bower, Long Beach, her co-pilot. Mrs. Bera thus became the most successful flyer in the history of the Powder Puff derby, having won in 1955 and 1953, and co-piloting the winning plane in 1951. The race standing is computed on a handicap basis. The novice award was won by Mrs. Betty Miller of Santa Monica, Calif., and Mrs. Helen Dodson of Marysville, Calif. Forty-seven of the 49 starting planes completed the 2,366-mi. contest.

The seventh international race for women from Hamilton, Ont., to Varadero Beach, Cuba, was won by Mrs. Marion Schorr Betzler of Columbus, O. The victor, at the controls of a Luscombe 8-E, flew alone in the 1,526-mi. event. Eighteen of 25 starters finished.

(See also AVIATION, MILITARY.)

(T. V. H.)

Air Travel: see AVIATION, CIVIL.

A.L.A.: see AMERICAN LIBRARY ASSOCIATION.

Alabama. Alabama, the "heart of Dixie," was a part of the Mississippi territory when it was admitted to the union on Dec. 14, 1819, as the 22nd state. Located in the southeastern part of the United States, it is bounded by Tennessee on the north, Georgia on the east, Florida and the Gulf of Mexico on the south and Mississippi on the west. Known as the "Cotton state" or "Yellow-hammer state" (from the state bird, the yellow-hammer or flicker), Alabama's area includes 51,078 sq.mi. of land and 531 sq.mi. of water. The 1950 census population of Alabama was 3,061,743, of which 1,340,937 was urban and 1,720,806 rural; 2,079,591 white and 982,152 nonwhite. The census bureau's provisional estimate of the population July 1, 1956, was 3,135,000. Montgomery, the state capital, had a population of 106,525 in 1950. Other major Alabama cities and their population (1950 census): Birmingham 326,037, Mobile 129,009, Gadsden 55,725, Tuscaloosa 46,396, Bessemer 28,445, Anniston 31,066, Dothan 21,584, Decatur 19,974, Huntsville 16,437, Phenix City 23,305, Selma 22,840 and Florence 23,879.

History.—The history of Alabama in 1956 was written to the theme of industrial growth and expansion. This was the continuation of a trend which had been building for a decade. In the nine-year period which ended in 1956 Alabama led all southeastern states in the percentage of industrial employment increases, ranked second in the entire south and eighth in the nation. In 1956 new industry came into Alabama at the rate of \$6.708,000 per month for a total of \$61,116,000 through September. Industry already in Alabama expanded at the rate of \$21,903,000 per month for a total of \$197,123,000 through September. This made a grand total for industrial growth of \$258,239,000 for the state through the month of September.

With the support of Gov. James E. Folsom and the legislature, the Alabama state planning and industrial development board pressed forward in its efforts to develop Alabama's inland waterway system. Alabama's state docks in the port of Mobile provided berths for 22 ships and an expansion program was under way to increase this to 25 berths. The board initiated plans for docks on Alabama's rivers: the Tennessee in north Alabama; the Coosa, Alabama, Black Warrior and Tombigbee in central Alabama, all of which converge on the port of Mobile; and the Chattahoochee in the southeastern part of the state.

On Jan. 3, 1956, Governor Folsom called the legislature into special session for the purpose of submitting the question of a constitutional convention to the people of Alabama. One of the prime reasons for the convention was to bring about a reapportionment of Alabama's legislature, which according to the constitution of 1901 was to be done every ten years based on the



PROTESTING ENROLMENT OF A NEGRO, students of the University of Alabama burned desegregation literature in a demonstration at Tuscaloosa, Ala., in Feb. 1956

federal census. This had never been done. The legislature did not call a convention, but on Feb. 3, 1956, an amendment to the constitution was approved which was to be submitted to the voters on Nov. 6, 1956.

Principal state officials during the period Jan. 1955 to Jan. 1959 were: governor, James E. Folsom; lieutenant governor, W. Guy Hardwick; attorney general, John Patterson; state auditor, Mrs. Agnes Baggett; commissioner of agriculture and industries, A. W. Todd; secretary of state, Miss Mary Texas Hurt; state treasurer, John Brandon; state education superintendent, Austin R. Meadows.

Of the votes cast in the 1956 presidential election in Alabama, 56% were Democratic, 39% were Republican and the remainder were Independent. Lister Hill (Dem.), was returned to the U.S. senate unopposed. Alabama congressmen, all Democrats, returned to office were Robert E. Jones, Kenneth Roberts, Albert Rains, Carl Elliott, George Huddleston, Jr., Armistead I. Selden, Jr., Frank W. Boykin, George Grant and George W. Andrews. Other state officials, all Democrats, elected to office were: Davis S. Stakely and James S. Coleman, associate justices of the supreme court; and Aubrey M. Cates, Jr., court of appeals.

Education.—In the 1954-55 school year, Alabama operated a total of 2,781 schools in the public school system (elementary and high schools). There were 1,395 elementary schools, but 2,632 of the schools had some elementary grades. There were 450,840 elementary pupils taught by 13,940 teachers, plus 412 supervising principals. There were 282,552 high school pupils and 10,482 high school teachers, plus 515 supervising principals. State expenditures for education (secondary system, colleges, trade schools, etc.) in the fiscal year ended Sept. 30, 1956, amounted to \$110,800,000.

Social Insurance, Public Welfare and Related Programs.—During the fiscal year ended Sept. 30, 1955, annual expenditures for Alabama's department of pensions and security totalled \$44,930,332.85. Expenditures for public assistance with the average number of persons receiving assistance in parentheses were as follows: old-age assistance \$26,553,344.77 (68,911); aid to the blind \$665,966.95 (1,583); aid to the totally and permanently disabled \$4,161,978.03 (9,736); aid to dependent children \$9,168,080.43 (17,645);

aid to children in foster care \$342,710.54 (915); and temporary aid \$42,940.99 (149).

Alabama in 1955 operated 7 prisons and 31 road camps. The total number of prisoners on Sept. 30, 1956, was 5,336. Total expenditures for the prison system during the fiscal year ended Sept. 30 were \$6,529,088.82. State appropriations for the 1955-56 fiscal year amounted to \$1,295,000.

Public health expenditures for the 12-month period ended June 30, 1956, totalled \$6,586,750. This figure included \$2,904,218 in state funds, \$1,787,792 federal funds and \$1,894,740 local funds.

Maternal and child health services included 2,519 maternity clinic sessions in 47 counties, with 40,953 patients admitted; 501 well-baby clinic sessions in 18 counties, with 9,317 patients admitted; and 1,111 dental clinic sessions in 26 counties with 10,651 patients admitted.

Communication.—All highways and roads in the state, as of Dec. 31, 1955, (federal, state and local combined) totalled 63,085 mi., of which 18,386 mi. were paved and 29,273 mi. were either soil-surfaced or graveled.

State and federal disbursements for highways and roads totalled \$111,261,000 in the 1955-56 fiscal year (estimated). New road and highway construction completed in the 1955-56 fiscal year aggregated 1,600 mi. (approximately). Alabama's railroad mileage during the year was 5,102.5. There were 551,326 telephones in the state. Alabama had 108 airports composed of 43 public fields, 8 private fields, 8 military bases, 18 commercial airports and 31 personal fields. There is heavy barge traffic on the Tennessee river in north Alabama.

Banking and Finance.—As of Sept. 30, 1956, Alabama had 168 state banks with three branches with total deposits of \$429,948,918. Total resources were \$473,739,202. There were 69 national banks with 40 branches with total deposits of \$1,163,320,000 and total resources of \$1,273,787,000. The state also had seven state chartered savings and loan associations with total resources of \$27,994,207; 26 federal chartered savings and loan associations with total resources of \$69,186,774; 112 state chartered credit unions with total resources of \$23,388,520; and 62 federal chartered credit unions with total resources of \$7,845,000.

Total state (government) receipts in the fiscal year ended Sept. 30, 1955, were \$266,483,451.55. Total state expenditures for that period were \$276,808,848.27. The state's gross debt was \$42,528,000 and the net debt was \$37,849,000.

Agriculture.—Alabama's total agricultural production in 1955 was valued at \$550,141,000, an increase of 8.5% over 1954. The cotton crop (lint and seed) grossed \$145,854,000 compared with \$143,327,000 in 1954. Peanuts grossed \$24,021,000 compared with \$12,050,000 in 1954. Cash receipts from marketings to Alabama farmers from crops in 1955 were \$268,585,000 compared with \$208,772,000 in 1954; from livestock and livestock products \$190,980,000 compared with \$182,465,000 in 1954.

Table I.—Production of Leading Crops in Alabama

Crop	Indicated 1956	1955	Average, 1945-54
Cotton, bales	730,000	1,045,000	880,000
Corn, bu.	56,100,000	68,010,000	44,008,000
Peanuts, lb.	203,775,000	213,750,000	258,000,000
Hay, tons	822,000	879,000	671,000
Potatoes, Sweet, bu.	720,000	936,000	995,000
Oats, bu.	5,445,000	4,420,000	3,686,000
Soybeans, bu.	2,090,000	2,162,000	1,128,000
Sorghum grain, bu.	558,000	874,000	445,000
Peaches, bu.	600,000	*	753,000
Pecans, lb.	22,000,000	8,000,000	15,266,000

*Less than 500 bushels.

Source: U.S. Department of Agriculture.

Manufacturing.—Alabama in 1955 had an estimated 4,700 manufacturing establishments employing approximately 251,000 persons, the payroll profit income of which was \$1,230,000,000. The output value was \$3,255,000,000. Primary metals provided employment for 48,000 people and had a payroll-profit income of \$399,000,000. Textiles employed 50,000 people with a payroll-profit income of \$155,000,000. Lumber employed 34,000 with a payroll-profit income of \$74,000,000. Food products employed 16,000

Table II.—Principal Industries of Alabama

	All em- ployees 1954	Salaries and wages 1954 (in 000s)	Value added by manu- facture 1954 (in 000s)	Value added by manu- facture 1953 (in 000s)
Food and kindred products	16,206	\$ 46,315	\$ 96,545	\$ 75,982
Textile mill products	45,874	109,789	167,183	205,134
Apparel and related products	17,915	33,556	63,794	49,352
Lumber and products (except furniture)	28,521	52,294	86,590	101,424
Paper and allied products	8,674	35,008	77,078	69,279
Petroleum and coal products	3,091	13,353	64,274	75,308
Stone, clay and glass products	7,278	24,135	57,862	52,724
Primary metal industries	37,430	159,556	314,192	319,857
Fabricated metal products	8,707	33,195	68,116	60,102
Machinery (except electrical)	5,987	24,209	35,049	39,187
Transportation equipment	11,033	43,912	57,901	*

*Withheld because the estimate did not meet publication standards, either on the basis of the associated standard error of estimate or on the basis of a consistency review.

Source: U.S. Department of Commerce, 1954 Census of Manufactures, preliminary report.

people and its payroll-profit income figure was \$64,000,000. The output value of primary metals was \$768,000,000; textiles \$526,000,000; lumber \$224,000,000; food products \$293,000,000. (RH. H.)

Mineral Production.—Table III shows the preliminary data on Alabama minerals for 1954, the latest available, compared with 1953. It includes all minerals valued at \$100,000 or more. In 1954 Alabama was 3rd in output of graphite and crude iron ore, 3rd in output and 4th in consumption of coke, 5th in pig iron production, 6th in lime output, and was 20th in value of its mineral production, with 1.08% of the U.S. total.

Table III.—Mineral Production of Alabama

(In short tons, except as noted)

Mineral	Quantity	Value	Quantity	Value
	1953	1953	1954*	1954*
Total		\$187,087,000		\$151,330,000†
Cement (bbl.)	10,427,000	25,701,000	11,122,000	28,583,000
Clays	1,198,000	1,816,000	1,331,000	2,258,000
Coal	12,532,000	79,370,000	10,283,000	64,030,000
Coke†	6,278,000	72,502,000		
Ferrous†	124,000	20,433,000		
Iron ore	7,446,000	55,640,000	5,913,000	33,327,000
Iron, pig†	4,669,000	217,757,000		
Lime	471,000	5,018,000	422,000	4,488,000
Petroleum (bbl.)	1,694,000	3,290,000	1,584,000	3,690,000
Sand and gravel	3,711,000	3,003,000	3,966,000	3,451,000
Stone	3,957,000	8,154,000	7,394,000	11,609,000
Other minerals	...	5,095,000	...	4,860,000

*Preliminary. †The total has been adjusted to eliminate duplication in the value of clays and stone. ‡Values for processed materials are not included in the totals.

Source: U.S. Bureau of Mines.

ENCYCLOPEDIA BRITANNICA FILMS.—*Southeastern States* (1956).

Aland Islands: see FINLAND.

Alaska. Alaska, the northernmost territory of the United States, is separated from Siberian U.S.S.R. by Bering strait. The boundary line follows the international date line between Big Diomed Island, which is soviet soil and in the eastern hemisphere, and Little Diomed Island, which is United States territory and in the western hemisphere. These islands are about three miles apart. Alaska has an area of 586,400 sq.mi. Its population in 1950 was 128,643, including military personnel. The 1954 estimated population was 208,000, including approximately 80,000 military personnel and their dependents. The largest city is Anchorage (1955 est. 40,000) with Fairbanks (12,000) second. Other centres of population are Juneau, Ketchikan, Kodiak, Seward, Sitka, Wrangell, Petersburg, Nome and Palmer. The Aleutian Islands, extending about 1,200 mi. westward from the extremity of the Alaska peninsula, are part of Alaska.

History.—The most significant political event of 1955–56 was the drafting of a constitution for the proposed state of Alaska and the ratification of this draft by the voters. Fifty delegates to the constitutional convention assembled at the University of Alaska at College, near Fairbanks, on Nov. 8, 1955, for a session of 75 days. The constitution, modelled on those of other states, provided for the legislative, executive and judicial departments of government. The legislature would have 60 members, 20 in the senate and 40 in the house. The executive department would have only two elective officials, the governor and the secretary of state. The governor, who could serve not more than two successive terms, would appoint other state officials and department heads, subject to confirmation by the legislature. The judiciary provided by the Alaska constitution would consist of a supreme court of three justices, and a superior court of five judges. Justices and judges would be appointed by the governor but subject to approval or rejection by the voters after three years, and again at intervals thereafter. The constitution set the voting age at 19 years, prohibited state debt except for capital improvements when authorized by law and ratified by a majority of the voters, provided for the initiative, referendum and recall and for local government. The proposed constitution was ratified on April 27, 1956, by a vote of 17,447 to 7,180. The constitutional convention, by ordinance subject to ratification by the voters, provided for the immediate election of two United States senators and a congressman. This proposal was ratified by a vote of 15,011 to 9,556, and the two major political parties nominated candidates for these offices at territorial conventions.

Exploration for oil and gas continued in several areas during 1956 and there was continued interest in forest resources. The U.S. forest service contracted during the year for the sale of 7,500,000,000 bd.ft. of timber for a pulp mill at Juneau and for 5,250,000,000 bd.ft. for a pulp mill at Sitka, both sales from Tongass National forest. Late in the year, neither mill had started

construction. Military construction of the radar Distant Early Warning (DEW) line and other defense installations continued at a high level.

Alaska officials in 1956, appointed by the president, were B. Frank Heintzleman, governor, and Waino E. Hendrickson, secretary. Elected officials were J. Gerald Williams, attorney general; Henry E. Benson, labour commissioner; Hugh J. Wade, treasurer, and Irving M. Reed, highway engineer.

The vote in Alaska's general election, held on Oct. 9, 1956, was heavily Democratic. The new offices provided by the constitutional convention, two senators and a representative, were filled by Democrats, as were a substantial majority of the seats in the Alaska legislature.

Education.—During the 1955–56 school year a total of 36,340 students were enrolled in elementary and secondary schools operated under the direction of the Alaska department of education. Approximately 5,000 were enrolled in grades 1 through 12 in 84 day schools and two boarding schools operated by the Alaska native service, a division of the U.S. bureau of Indian affairs. On-campus registration at the University of Alaska was 556.

Communications.—The Alaska railway, owned by the federal government, extending from Seward and Anchorage on the coast to Fairbanks, had 470 mi. of main track. The White Pass & Yukon railway, operating between Skagway, Alaska, and Whitehorse, Yukon Territory, Can., had 20 mi. of track in Alaska. Alaska had no rail connection with the U.S.

The territory had approximately 1,000 mi. of through roads, 700 mi. of which were paved. There were 1,200 mi. of feeder roads and 1,500 mi. of local roads. The Alaska highway running through Canada connected with highways to the U.S.

Most passenger travel in Alaska and between Alaska and the U.S. was by plane. Nine certificated mail carriers, two certificated nonmail carriers, 10 exempted carriers, and 115 pilot-owners were engaged in air transportation within Alaska or between Alaska and other points during the year 1956.

Radio and telegraphic communication with Alaska and between Alaska and other places was handled by the Alaska Communication system, operated by the signal corps of the U.S. army. There were 14 radio broadcast stations and 6 television stations in operation in Alaska in 1956. Six daily and 14 weekly or semiweekly newspapers and several periodicals were published in the territory.

Banking and Finance.—In the fiscal year ended June 30, 1956, territorial tax collections amounted to \$18,342,874, up from \$14,945,331 the previous fiscal year. At the end of the fiscal year the territory's cash balance was \$7,103,906 and its general fund balance was \$4,069,123.32. Both were down from the previous year's totals. The territory has no bonded indebtedness. On June 30, 1956, 6 national and 12 territorial banks in Alaska had a combined capital of \$3,213,000, surplus of \$3,227,640, deposits of \$155,111,053 and undivided profits of \$2,188,442.

Agriculture.—The territory produced \$2,815,763 worth of agricultural products in 1955, with dairy products accounting for nearly half the total. Cropland in the territory totalled 14,764 ac.

Timber.—A total of 220,000,000 bd.ft. of timber, valued at \$502,000, was cut from Alaska's two national forests during the fiscal year ended June 30, 1956, an increase of 20% over 1955. An additional 22,000,000 bd.ft., valued at \$52,878, was cut from public lands.

Fisheries.—Products of the Alaska fishing industry in 1955 amounted to 186,159,932 lb., with a wholesale value of \$69,722, 887. In 1956 the Alaska salmon fisheries produced approximately 3,000,000 cases of canned salmon, an increase of 700,000 over the poor pack of 1955. (B. F. Hn.)

Mineral Production.—The accompanying table shows the tonnage and value of those mineral commodities produced in Alaska in 1953 and 1954 whose value exceeded \$100,000, with the exception of mercury.

Mineral Production of Alaska

(In short tons, except as noted)

Mineral	Quantity	Value	Quantity	Value
	1953	1953	1954*	1954*
Total		\$24,252,000		\$24,412,000
Chromite	...	...	3,000	208,000
Coal	861,000	8,452,000	665,000	6,442,000
Gold (oz.)	254,000	8,882,000	249,000	8,698,000
Mercury (76-lb. flasks)	40	8,000	1,000	277,000
Sand and gravel	7,689,000	5,080,000	6,640,000	6,302,000
Stone	47,000	170,000	284,000	465,000
Tin concentrate (long tons)	49	106,000	199	410,000
Other minerals	...	1,554,000	...	1,610,000

*Preliminary.

Source: U.S. Bureau of Mines

ENCYCLOPEDIA BRITANNICA FILMS.—*Alaska* (1941); *Alaska: Reservoir of Resources* (1955).

Albania. This people's republic in the western part of the Balkan peninsula is bounded north and east by Yugoslavia, south by Greece and west by the Adriatic sea. Area: 11,100 sq.mi. Pop.: (1945 census) 1,112,355; (1955 census) 1,394,310. Language: literary Albanian and two spoken dialects, Gheg north of the Shkumbi river and Tosk in the south. Religion: Moslem 65%, Eastern Orthodox 23%, Roman Catholic 11%. Chief towns (1949 est.): Tirana (cap.) 80,000; Scutari or

Shkoder 30,000; Koritsa or Korce 28,000. First secretary of the Albanian Workers' (Communist) party in 1956 was Enver Hoxha; chairman of the presidium of the people's assembly, Haxhi Leshi; chairman of the council of ministers, Mehmet Shehu.

History.—During 1956 Albania underwent no major change in its Communist regime and the government continued in uneasy control of the country. Even the Soviet denunciation of J. V. Stalin had relatively few repercussions in Tirana, where the Communist party and its policy could be described as "Stalinist." On April 14 the first secretary of the Communist party, Enver Hoxha, wrote an article in the press admitting that the "cult of the individual" had penetrated into the Albanian party, but he made no promises to improve the situation by policy or personnel changes. At the third congress of the party, which opened on May 25, Hoxha again evaded the issues raised at the Soviet party congress. He was firmly against any rehabilitation of purged "Titoists" in Albania and specifically refuted any suggestion of awarding that distinction to Koci Xoxe, who had been executed as a "Titoist" in 1949. At the end of the congress the Albanian Communist leadership emphasized its policy of resisting change by re-electing to the Politburo both the first secretary, Hoxha, and the prime minister, Mehmet Shehu. Government changes announced on June 4 represented a reallocation of duties among existing leaders.

There were, however, some practical changes in industry and agriculture. The prime minister revealed that the first five-year plan which came to an end in 1955 had been too ambitious and that several important projects had had to be abandoned. In agriculture a reversal in policy on collectivization occurred. The government announced that full-scale collectivization of the land was to be resumed. The number of collective farms was to be doubled during 1956, and by 1960 about 70% of arable land instead of the present 27% should be cultivated by collective farms.

In a reference to the contradiction with the previous year's decision to ease the burden of collectivization, the Communist party paper *Zeri i Popullit* explained that many party leaders had "misunderstood" the decision, which did not mean that the setting up of collective farms would cease.

Some progress was made in Albania's relations with Greece. For the first time since 1939 direct contact was temporarily established between the two governments over an Albanian offer to repatriate Greek soldiers who had been held in Albania since their capture during the Greek Communist rebellion of 1947-49. On Aug. 21 a Greek ship sailed for Athens from Durazzo with 217 Greek soldiers on board. The occasion was used by the Albanians for a further appeal for the resumption of diplomatic relations between Albania and Greece. (M. MACK.)

Education.—Schools (1954): primary 2,140, pupils 136,800; higher primary 315, pupils 39,700; secondary 28, pupils 8,600; teachers' training college and five institutions of higher education, all students 1,200.

Finance.—Budget (1954 est.; 1955 est. in parentheses): revenue 10,109,000,000 leks (12,300,000,000 leks); expenditure 9,000,000,000 leks (11,600,000,000 leks), including 3,519,000,000 leks (4,575,000,000 leks) invested in the national economy. Monetary unit: lek with official exchange rate, high and fictitious, of 50 leks to the U.S. \$1.

Foreign Trade.—Estimated imports in 1952: 908,700,000 leks. Main sources of imports: U.S.S.R., Czechoslovakia, Rumania, Poland. Main imports (1952): machinery, textiles, petroleum products, wheat (30,000 tons), maize (20,000 tons), cement (18,000 tons), paper (13,000 tons), window glass (60,000 sq.meters). Main exports: crude oil, pig copper, chrome ore.

Transport and Communications.—Highways (1955) 1,716 mi. Licensed motor vehicles (Dec. 1955): cars 800, commercial 1,700. Railways (1951): 81 mi. linking Duresi (Durazzo) with Tirana and Elbassan via Kavaja-Peqini. Telephones (1954 est.): 1,700. Radio receiving sets (1950): 40,025.

Agriculture.—Grain crop, including about 70% maize: (1934-38 average) 192,000 metric tons; (1955) 318,000 metric tons. Livestock (1938; 1950 est. in parentheses): sheep 1,573,900 (1,707,000); goats 932,000 (830,000); cattle 134,000 (129,000); pigs 15,300 (47,000); horses 54,400 (50,000); asses 44,600 (40,000).

Industry.—Production (1950; 1955 in parentheses): crude oil 132,000 (263,000) metric tons; electricity 21,000,000 (57,000,000) kw.hr.; cement

15,000 (34,000) tons; cotton and woollen textiles 1,100,000 (17,900,000) metres; footwear 272,000 (563,000) pairs.

Alberta. Most westerly of Canada's prairie provinces, Alberta, formerly a part of the Northwest Territories, celebrated its 50th anniversary as a province in 1955. Area: 255,285 sq.mi., of which 6,485 sq.mi. are water. Pop.: June 1, 1955 (official figures), 1,066,000. Largest city: provincial capital, Edmonton, pop. 209,353, metropolitan area, 229,000. Second largest city: Calgary, pop. 168,840, metropolitan area, 180,000.

History.—Agriculture still held a dominant place in Alberta's economy during 1956, but the rapid development of oil and other natural resources in the last few years had made an important contribution to its economy. Increased economic activity was evident in all sectors except the farming community. Mineral production, manufacturing, electric power consumption, construction, retail and wholesale trade and forestry production all exceeded previous post-World War II records, and business conditions were stable. The Mahaffy commission (provincial), formed to investigate charges of maladministration brought against the provincial government during the 1955 election, exonerated all charges. But it was noted that security pledged by members on loans from provincial government banks was inadequate, including such items as hypothecation of future indemnities for parliamentary services, etc.

The Social Credit government (elected June 1955) was comprised of: Ernest Manning, premier, minister of mines and minerals and attorney general; W. W. Cross, minister of health; A. J. Hooke, minister of municipal affairs and provincial secretary; G. E. Taylor, minister of highways, railways and telephones; A. O. Aalborg, minister of education; L. C. Halmrast, minister of agriculture; N. A. Willmore, minister of lands and forests; R. D. Jorgenson, minister of public welfare; E. W. Hinman, provincial treasurer; J. Hartley, minister of public works; F. C. Colborne, minister without portfolio; A. R. Patrick, minister of economic affairs; R. Reiersen, minister of industries and labour.

Education.—Schoolrooms in operation June 30, 1955, totalled 7,368 compared with 6,946 in 1954. Estimated enrolment was 214,000; estimated teachers, 8,191. Estimated school grants (operational) 1955-56, \$25,760,000.

Public Health and Welfare.—Hospitalization expenditures (1954) totalled \$15,335,816. The hospitalization estimate (1955) was \$19,100,000. Public welfare expenditures (1954) amounted to \$8,632,815 to 11,900 recipients.

Transportation and Communication.—In 1955 there were 32,059 mi. of gravelled or surfaced roads and highways in the province compared with 29,861 mi. in 1954. Motor vehicles licensed totalled approximately 354,000 as compared with 338,541 in 1954. Railway traffic reports for 1955 showed that 11,300,000 tons of revenue freight were loaded and 6,100,000 tons unloaded at Alberta stations; exports approximated 5,300,000 tons. Latest telephone statistics (1951) listed approximately 165,000 instruments.

Banking and Finance.—Bank clearings (1954) were \$4,584,000,000. The budget estimate for over-all revenue for the 1956-57 fiscal year was \$208,760,610, an increase over the \$177,400,000 of 1955-56. Total estimated expenditures were \$242,400,000.

Agriculture.—Total farm value of agricultural production in 1955 was \$409,595,000, including wheat \$180,880,000, oats \$60,900,000, barley \$83,000,000, rye \$2,808,000, mixed grains \$16,123,000, root crops \$65,794,000. The value of livestock and livestock products was \$239,296,000.

Fisheries, Fur and Forestry.—Fisheries produced (1955) 8,731,264 lb., valued at \$1,143,499. The number of furs trapped was 1,755,876 valued at \$2,136,851; the fur trade remained in the doldrums with trappers unable to cover expenses because of adverse market conditions. The 136,245 animals pelted on Alberta fur farms (1955 season) were valued at \$2,504,556. Sales of wild animals from fur farms were \$215,850. Forestry production was 430,000,000 f.b.m. compared with 366,000,000 f.b.m. in 1954. The value of lumber and forestry products increased from \$18,236,000 (1954) to \$21,300,000 (1955).

Manufacture and Industry.—During 1955, 1,496 companies were incorporated or registered with authorized capital of about \$139,946,515. The value of manufactured products for 1955 was \$647,500,000 compared with \$570,000,000 (1954). Petrochemical plants accounted for the single largest increase, but all industrial groups showed gains. The index of industrial employment at Oct. 1, 1955, was 10% higher than 1954. Electric power consumption rose from 1,500,875,000 kw.hr. in 1954 to 1,738,868,000 kw.hr. in 1955, a 16% increase.

The value of building construction (1955) was \$309,030,000; that of engineering construction was \$290,289,000, including salaries and wages \$186,066,000 and cost of material \$267,469,000.

Minerals and Mining.—Mineral production for 1955 was worth about



BARBED WIRE in the Casbah section of Algiers. Barricades were erected by French police in 1956 to prevent fugitives from escaping through the narrow streets of the city's Moslem quarter

\$323,740,702, of which the following were major items: coal, 4,344,377 tons, valued at \$23,216,397; natural gas, 126,750,000 m.c.f., valued at \$9,506,250; crude petroleum, 112,200,000 bbl., valued at \$273,094,800. Not included was 29,000 tons of elemental sulphur produced by gas-absorption plants. The gross production of crude oil increased (in quantity) 28% over 1954. (P. H. GL.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Prairie Provinces of Canada* (1943).

Alcoholic Intoxication: see INTOXICATION, ALCOHOLIC.

Alcoholic Liquor: see BREWING AND BEER; LIQUORS, ALCOHOLIC; WINES.

Alcoholics Anonymous: see SOCIETIES AND ASSOCIATIONS, U.S.

Aleutian Islands: see ALASKA.

Alfalfa: see HAY AND PASTURES.

Algeria. A French territory of North Africa. Algeria is situated between Morocco (west) and Tunisia (east), with the status of government general of the French union. Total area: 846,124 sq.mi., administered in two parts: northern Algeria (80,966 sq.mi.), comprising 12 overseas *départements*, and four territories of southern Algeria (765,158 sq.mi.). Pop. (1954 census): 9,528,670, including 9.6% in the southern territories; Moslems (Arabs and Berbers) 8,448,259; French (predominantly Roman Catholic) 934,069; other Europeans 49,979; counted apart (members of armed forces) 96,363. Chief towns (1954 census, urban agglomerations): Algiers (cap.) 355,040; Oran 291,812; Constantine 143,334; Bône 112,010. Governors general (after Feb. 1 known as minister resident in Algeria) in 1956: Jacques Soustelle; Gen. Georges Catroux (Feb. 1); Robert Lacoste (from Feb. 9).

History.—On the settlement of the Tunisian and Moroccan questions, the problem of Algeria became outstanding. On the one hand there was Moslem nationalism, which found its expression in the armed rising of the *fellaghas* and in sporadic assassinations; on the other, the opposition of 950,000 Frenchmen, most of them representing families settled in the country for several generations. The French government's decision not to give up Algeria necessitated the dispatch of large forces (estimated by the end of 1956 at 400,000) and considerable national expenditure. (See also UNITED NATIONS.)

In Jan. 1956 the 61 Moslem deputies began demanding a parley to frame a new constitution for Algeria. Jacques Soustelle, the

governor general, suggested that the whole of Algeria should become an integral part of France, as a number of *départements*. Gen. Georges Catroux was appointed to succeed him, with the rank of minister resident in Algeria in the Guy Mollet government. The European population considered Catroux to be prejudiced in favour of the Moslems and raised a great outcry at Soustelle's departure.

On Feb. 6, during the French premier's visit to Algiers, there were violent demonstrations by the Europeans; a Committee of Public Safety was formed to defend their interests. Catroux resigned, and Robert Lacoste, a Socialist, formerly minister of finance, took his place. Mollet, while declaring that France would stay in Algeria, insisted that Algerian individuality was embraced by the community of Frenchmen and asked the *fellaghas* to lay down their arms with a view to organizing free elections on a basis of universal suffrage.

In March the French national assembly, including the Communists, voted full powers to the government. The dispatch of troops continued; and as their freedom of movement was enhanced by the use of helicopters and parachute forces, their operations against the insurgents became more effective. The rebels then gave up their hope of establishing control over large areas and turned to a strategy of sporadic *coups* (attacks on isolated farms, bomb throwing and assassinations in the towns) or of collective massacres (notably that of April 24, when the victims were the villagers of the Souman valley, who had adhered to the French). (See also FRENCH UNION.) (Hu. DE.)

Education.—Schools (1954-55): primary (French and Moslem) 2,369, pupils 436,577; secondary (French only) 44, pupils 34,468 (1953-54, pupils at higher Moslem schools 631); 1 university, students 5,149.

Foreign Trade.—(1955) Monetary unit: the French metropolitan franc. U.S. \$1 = 350 metropolitan francs. Note circulation: 118,000,000,000 fr. Imports 243,000,000,000 fr., including 199,000,000,000 fr. from France. Exports 161,000,000,000 fr., including 118,000,000,000 fr. to France. Principal exports: wine 62,000,000,000 fr., iron ore 12,000,000,000 fr., citrus fruit 10,000,000,000 fr.

ENCYCLOPÆDIA BRITANNICA FILMS.—*Mediterranean Africa* (1952); *Life in the Sahara* (1953).

Aliens: see IMMIGRATION, EMIGRATION AND NATURALIZATION.

Alimentary System, Disorders of: see STOMACH AND INTESTINES, DISEASES OF THE.

Allergy. Since allergic diseases are mediated by immunologic mechanisms, much of the investigative work during 1956 was done in this particular field. The production and distribution of antibodies was studied by means of labelling them with radioactive isotopes. Similar studies were done to establish the nature of the substance, called antigen, exposure to which produces allergic manifestations. The evidence produced corroborated the original impression that at least in some forms of allergy, the union of antigen and antibody liberates in the tissues a chemical which is like histamine. The allergic manifestations are then produced as a result of the action of this substance on the tissues.

Much interest was evident in the study of connective tissue. This tissue is found widely distributed throughout the body and is found also in the walls of blood vessels. Connective tissue may become involved as a result of the influence of many noxious agents, such as starvation, radiation, stress, cold and allergy, particularly allergy to drugs. Diffuse connective tissue disease and particularly polyarteritis nodosa was shown to be associated with intractable bronchial asthma and allergy to such drugs as sulfonamides, iodine, etc. Considerable evidence, both clinical and experimental, was produced to indicate the immunologic character of this disease.

Attention continued to be devoted in medical literature during the year to the effect of steroids in connection with antibody formation and in the treatment of allergic disorders. Two new synthetic drugs, prednisone and prednisolone, were introduced. They correspond roughly to cortisone and hydrocortisone respectively. These drugs were tried by Leo H. Crip on 96 patients suffering with severe asthma, nasal allergy and skin allergy. The results indicated that these drugs are valuable in the symptomatic treatment of allergic conditions. Since they do not lead to sodium and therefore to water retention as is the case with cortisone and hydrocortisone, they were found to be preferable to the use of the latter products. However, about 10% of the patients did show some side reactions making it necessary in these instances to discontinue their use.

Much evidence was produced to show that atopic dermatitis, sometimes referred to as flexor infantile eczema, is a truly allergic disease and not a condition resulting solely from anxiety and emotional factors. It was believed that inhalants, such as dust and pollen, as well as foods, may be among the causative factors.

Thrombocytopenic purpura and certain forms of anaemia were shown to be caused by allergy to certain drugs. Whenever a patient develops unusual manifestations during the course of treatment for any condition, drugs administered to the patient for the relief of his symptoms may be responsible for these symptoms.

Many more cases of drug allergy were reported. This phase of allergy was assuming increased proportions, especially reactions caused by antibiotics such as penicillin.

Extensive biochemical studies were conducted during the year on the biochemical nature of the delayed reaction in allergic contact dermatitis, such as poison ivy dermatitis.

Two new agencies were organized for the purpose of contributing to the development of new knowledge in allergy. One was the Foundation for the Study of Allergic Diseases and the other was the newly established section on allergy research of the National Institutes of Health.

(L. H. C.)

ENCYCLOPÆDIA BRITANNICA FILM.—*Allergies* (1952).

Alloys: see METALLURGY.

Almonds: see NUTS.

Altrusa International, Incorporated: see SOCIETIES AND ASSOCIATIONS, U.S.

Aluminum. In 1955, increased demand for aluminum caused world output to rise to a record height. Expansion of old plants and construction of new ones continued into 1956.

Table I.—World Production of Aluminum
(in 000 short tons)

	1950	1951	1952	1953	1954	1955
Austria . . .	19.8	29.1	40.5	47.9	52.9	63.1
Canada . . .	396.9	447.1	499.8	548.4	557.9	584.2
France . . .	66.8	99.6	117.0	124.6	132.3	142.7
Germany, West . . .	30.7	81.7	110.8	117.9	142.4	151.1
Great Britain . . .	33.0	31.1	31.4	34.6	35.4	27.4
Italy . . .	40.8	54.8	58.2	61.1	63.5	67.7
Japan . . .	27.3	40.7	47.0	50.1	58.5	63.4
Norway . . .	51.9	55.4	56.3	58.6	67.6	79.5
Switzerland . . .	21.2	29.8	30.2	32.5	28.7	33.1
U.S.S.R. . .	200.7	225.7	275.7	325.7	375.7	450.7
United States . . .	718.6	836.9	937.3	1,252.0	1,460.6	1,565.7
Others . . .	33.0	48.8	56.5	67.3	75.2	112.1
Total . . .	1,640	1,980	2,260	2,720	3,050	3,340

United States.—Based on data supplied by the U.S. bureau of mines. Table II shows the domestic situation. In 1955, the new record output was produced by three companies operating the full year and by a fourth new company in the last six months. Nationwide demand for aluminum was large and in some quarters so insistent that shipments to the government stockpile were diverted to industry. The 400,000 tons scheduled for delivery to the stockpile was cut to 125,000 tons.

Table II.—Data of Aluminum Industry in U.S.
(in 000 short tons)

	1950	1951	1952	1953	1954	1955*
Production, primary . . .	718.6	836.9	937.3	1,252.0	1,460.6	1,565.8
Imports, primary . . .	255.7	161.8	150.7	359.5	228.9	198.0
Exports, primary . . .	23.2	14.8	10.6	15.4	10.8	22.0
Producers' stocks . . .	-12.5	-8.5	-0.9	+39.3	+21.1	+15.0
Available new supply . . .	963.6	992.4	1,073.5	1,556.8	1,657.6	1,726.8
Secondary recovery . . .	243.7	292.6	304.5	368.7	292.0	334.3
From old scrap . . .	76.4	76.6	71.5	78.9	60.0	74.7
Secondary import† . . .	68.4	16.7	5.4	19.8	14.8	40.8
Total supply . . .	1,242.7	1,284.7	1,386.4	1,945.2	1,963.4	1,782.6
Consumption, primary . . .	896.4	973.9	1,072.3	1,556.8	1,696.9	1,748.0

*Preliminary. †Not equivalent of net imports (wt. x 0.9). Imports are largely scrap pig. Some duplication of secondary aluminum occurs because of small quantity of loose scrap imported, which is included as secondary recovery from old scrap.

With world consumption of aluminum increasing steadily, the U.S. bureau of mines, in mid-1956, announced plans to aid industry and government agencies in the fiscal year 1956-57. Plans included frequent revaluation of the aluminum situation of supply and demand and the collection of data on ore supplies and production capacity for aluminum to meet any emergency. The all-time high output of primary aluminum in the first half of 1956 (as facilities under construction were completed and reached their maximum potential) was lowered somewhat by strikes in August which idled about 47% of the nation's primary capacity. Output in the first eight months of 1956 was 1,104,334 tons.

Canada.—Output at the world's largest aluminum plant (Kitimat, B.C.) completed by Alcan at a cost of \$500,000,000 late in 1954, was curtailed in Jan. 1956 by a two-months' delay resulting from loss of power from avalanche-damaged transmission lines. Despite this and loss from drought in Quebec province, at its plants there, Alcan (Canada's sole aluminum producer) had a record output.

(F. E. H.; B. B. M.)

Ambassadors and Envoys. The following is a list of ambassadors and envoys to and from the United States, as of Oct. 1, 1956:

To the United States	Country	From the United States
*Ludin, Mohammad Kabir	Afghanistan	*Mills, Sheldon T.
*Vicchi, Adolfo A.	Argentina	*Beaulac, Willard L. (Vacancy)
*Spender, Sir Percy	Australia	*Thompson, Llewellyn E.
*Gruber, Karl	Austria	*Alger, Frederick M., Jr.
*Silvercruys, Baron	Belgium	*Drew, Gerald A.
*Andrade, Victor	Bolivia	*Briggs, Ellis O.
*Amaral Peixoto, Ernani do	Brazil	
	Bulgaria†	
*Win, U	Burma	*Satterthwaite, Joseph C.

To the United States	Country	From the United States
*Kimmy, Nong	Cambodia	*McClintock, Robert
*Heeney, A. D. P.	Canada	*Merchant, Livingston T.
*Gunewardene, R. S. S.	Ceylon	*Crowe, Philip K.
*Rodríguez A., Mario	Chile	*Lyon, Cecil B.
*Tong, Hollington K.	China	*Rankin, Karl L. ‡
*Urrutia, Francisco	Colombia	*Bonsal, Philip W.
*Facio, Gonzalo J.	Costa Rica	*Woodward, Robert F.
*Campa, Miguel A.	Cuba	*Gardner, Arthur
*Petrželka, Karel	Czechoslovakia	*Johnson, U. Alexis
*Kauffmann, Henrik de	Denmark	*Coe, Robert D.
*Salazar, Joaquín E.	Dominican Rep.	*Pheiffer, William T.
*Alvarado-Garaicoa, Teodoro	Ecuador	*Ravndal, Christian M.
*Hussein, Ahmed	Egypt	*Hare, Raymond A.
*Castro, Héctor David	El Salvador	*Mann, Thomas C.
Kaiv, Johannes§	Estonia	(Legation at Tallinn closed)
*Deressa, Yilma	Ethiopia	*Simonsen, Joseph
*Nyköp, Johan A.	Finland	*Hickerson, John D.
*Alphand, Hervé	France	*Dillon, C. Douglas
*Kreklér, Heinz L.	Germany	*Conant, James B.
*Makins, Sir Roger	Great Britain	*Aldrich, Winthrop W.
*Melas, George V.	Greece	*Allen, George V.
*Cruz-Salazar, José Luis	Guatemala	*Sparks, Edward J.
*Zepherin, Maclair	Haiti	*Davis, Roy Tasco
*Calles B., Policarpo|| . . . . .	Honduras	*Willauer, Whiting
Kós, Péter	Hungary	Wailes, Edward T.
*Thors, Thor	Iceland	*Muccia, John J.
*Mehta, Gaganvihari Lallubhai	India	(Vacancy)
*Notowidigdo, Moekarto	Indonesia	*Cunning, Hugh S., Jr.
*Amini, Ali	Iran	*Chapin, Selden
*Al-Shabandar, Moussa	Iraq	*Gallman, Waldemar J.
*Hearne, John Joseph	Ireland	*Taft, William Howard, III
*Eban, Abba	Israel	*Lawson, Edward B.
*Brosio, Manlio	Italy	*Luce, Clare Boothe
*Tani, Masayuki	Japan	*Allison, John M.
*Rifa'i, Abdul Monem	Jordan	*Mallory, Lester D.
*Yang, You Chan	Korea	*Dowling, Walter C.
*Souvannavong, Ouot R.	Laos	*Parsons, J. Graham
Spekke, Arnolds†	Latvia	(Legation at Riga closed)
*Khoury, Victor A.	Lebanon	*Heath, Donald R.
*Padmore, George A.	Liberia	*Jones, Richard Lee
*Muntasser, Saddigh	Libya	*Tappin, John L.
Žadeikis, Povilas	Lithuania	(Legation at Kaunas closed)
*Le Gallais, Hugues	Luxembourg	*Buchanan, Wiley T., Jr.
*Tello, Manuel	Mexico	*White, Francis
*Ben Aboud, El Mehdi	Morocco	*Cannon, Cavendish W.
*Shanker Shamsher Jang Bahadur Rana	Nepal	(Vacancy)
*Roijen, J. H. van	Netherlands	*Matthews, H. Freeman
*Munro, Sir Leslie	New Zealand	*Hendrickson, Robert C.
*Sevilla-Sacasa Guillermo	Nicaragua	*Whelan, Thomas E.
*Morgenstern, Wilhelm Munthe de	Norway	*Strong, L. Corrin
*Ali, Mohammed	Pakistan	*Hildreth, Horace A.
*Vallarino, Joaquín José	Panamá	*Harrington, Julian F.
*Enciso-Velloso, Guillermo	Paraguay	*Ageton, Arthur A.
*Berckemeyer, Fernando	Peru	*Achilles, Theodore C.
*Romulo, Carlos P.	Philippines	*Nufer, Albert F.
*Spasowski, Romuald	Poland	*Jacobs, Joseph E.
*Fernandes, Luis Esteves	Portugal	*Bonbright, James C. H.
Bruzan, Silvio	Romania	Thayer, Robert H.
*Al-Khayyal, Sheikh Abdullah	Saudi Arabia	*Wadsworth, George
*Du Plessis, W. C.	South Africa,	
	Union of	
*Areilza, José M. de	Spain	*Byroade, Henry A.
*Anis, Ibrahim	Sudan	*Lodge, John
*Boheman, Erik	Sweden	*Pinkerton, Lowell C.
Torrenté, Henry de	Switzerland	*Cabot, John M.
*Zeineddine, Farid	Syria	*Willis, Frances E.
*Sarasin, Pote	Thailand	*Moose, James S., Jr.
*Slim, Mongi	Tunisia	*Bishop, Max Waldo
*Görk, Haydar	Turkey	*Jones, G. Lewis
*Zaroubin, Georgi N.	U.S.S.R.	*Warren, Fletcher
*Lacarte, Julio A.	Uruguay	*Bohlen, Charles E.
*González, César	Venezuela	*Patterson, Jefferson
*Tran Van Chuong	Vietnam	*McIntosh, Dempster
Abu-Taleb, Sayed Abdurrahman ibn		Reinhardt, G. Frederick
Abdussamad?	Yemen	Wadsworth, George
*Mates, Leo	Yugoslavia	*Riddleberger, James W.

*Ambassador Unstarred—Minister.

†Diplomatic relations severed Feb. 24, 1950.

‡Resident at Taipei, Formosa; embassy at Nanking closed March 5, 1950.

§Acting consul general.

||First secretary, chargé d'affaires ad interim (July 23, 1956).

¶Minister plenipotentiary, chargé d'affaires (May 24, 1954).

¶Chargé d'affaires (Dec. 6, 1950).

¶Resident in Jidda, Saudi Arabia.

American Association of University Professors: see SOCIETIES AND ASSOCIATIONS, U.S.

American Association of University Women: see SOCIETIES AND ASSOCIATIONS, U.S.

American Bankers Association: see SOCIETIES AND ASSOCIATIONS, U.S.

American Bar Association: see SOCIETIES AND ASSOCIATIONS, U.S.

American Bible Society: see SOCIETIES AND ASSOCIATIONS, U.S.

American Cancer Society: see SOCIETIES AND ASSOCIATIONS, U.S.

American Chemical Society: see SOCIETIES AND ASSOCIATIONS, U.S.

American Citizens Abroad. Estimates received by the U.S. department of state from consular representatives of the United States showed that 566,173 American citizens were residing in various foreign countries as of Jan. 1, 1956. This represented an increase of 49,270 as compared with the census of the previous year. As shown by the table, the increase in the American population abroad was general throughout the world, with the largest gains taking place in the countries of Europe.

Estimate of U.S. Citizens Residing Abroad

	Jan. 1, 1956	Jan. 1, 1955	Increase
South America	42,156	41,301	855
Mexico and Central America	60,816	53,317	7,499
Europe	161,972	139,657	22,315
Asia	55,871	51,398	4,473
Africa	18,623	14,844	3,779
Australia and New Zealand	6,445	5,998	447
West Indies and Bermuda	25,404	24,639	765
Canada and Iceland	159,898	157,367	2,531
Philippines	34,988	28,382	6,606
Totals	566,173	516,903	49,270

The U.S. passport office reported that requests for passport facilities reached a record peak during 1955, when 528,009 passports were issued or renewed. This was an increase of 17% over the 452,049 applications which were processed in 1954. In the first six months of 1956 a total of 352,745 passports were issued or renewed. A study made of the applications received during that period showed New York leading with 82,320, California second with 44,575 and Illinois third with 21,865 applications. Housewives headed the occupational category with 94,170 applications.

The continuing upward trend in foreign travel by American citizens was attributed to larger incomes, longer vacations, speedier transportation and greatly improved travel facilities. These factors were used advantageously by the travel agencies in stimulating interest in foreign travel through the introduction of pay-later plans, attractive package tours, reduced off-season and family rates and other inducements. Foreign countries also encouraged the spending of American tourist dollars abroad by improving tourist accommodations and promoting entertainment and sightseeing attractions. Nearly all countries of western Europe had relaxed their border formalities and American tourists could travel freely in that general area without obtaining visas.

(See also TOURIST TRAVEL.)

(F. G. Kt.)

American Academy of Arts and Letters: see SOCIETIES AND ASSOCIATIONS, U.S.

American Academy of General Practice: see SOCIETIES AND ASSOCIATIONS, U.S.

American Academy of Political and Social Science: see SOCIETIES AND ASSOCIATIONS, U.S.

American Association for the Advancement of Science: see SOCIETIES AND ASSOCIATIONS, U.S.

American College of Dentists: see SOCIETIES AND ASSOCIATIONS, U.S.

American College of Hospital Administrators: see SOCIETIES AND ASSOCIATIONS, U.S.

American College of Life Underwriters: see SOCIETIES AND ASSOCIATIONS, U.S.

American College of Physicians: see SOCIETIES AND ASSOCIATIONS, U.S.

American College of Surgeons: *see* SOCIETIES AND ASSOCIATIONS, U.S.

American Correctional Association: *see* SOCIETIES AND ASSOCIATIONS, U.S.

American Dental Association: *see* SOCIETIES AND ASSOCIATIONS, U.S.

American Dialect Society: *see* SOCIETIES AND ASSOCIATIONS, U.S.

American Economic Association: *see* SOCIETIES AND ASSOCIATIONS, U.S.

American Federation of Labor: *see* LABOUR UNIONS.

American Geographical Society: *see* SOCIETIES AND ASSOCIATIONS, U.S.

American Historical Association: *see* SOCIETIES AND ASSOCIATIONS, U.S.

American Hotel Association: *see* HOTELS, U.S.

American Indians: *see* INDIANS, AMERICAN.

American Institute for Property and Liability Underwriters: *see* SOCIETIES AND ASSOCIATIONS, U.S.

American Institute of Accountants: *see* SOCIETIES AND ASSOCIATIONS, U.S.

American Institute of Architects: *see* SOCIETIES AND ASSOCIATIONS, U.S.

American Institute of Chemical Engineers: *see* SOCIETIES AND ASSOCIATIONS, U.S.

American Institute of Electrical Engineers: *see* SOCIETIES AND ASSOCIATIONS, U.S.

American Institute of Mining, Metallurgical, and Petroleum Engineers: *see* SOCIETIES AND ASSOCIATIONS, U.S.

American Institute of Physics: *see* SOCIETIES AND ASSOCIATIONS, U.S.

American Iron and Steel Institute: *see* SOCIETIES AND ASSOCIATIONS, U.S.

American Law Institute: *see* SOCIETIES AND ASSOCIATIONS, U.S.

American Legion: *see* VETERANS' ORGANIZATIONS, U.S.

American Library Association. Oldest professional library organization in the world and chief spokesman of libraries in North and South America, the American Library association (A.L.A.) in 1956 had a membership of approximately 20,000, an endowment capital of \$2,600,000, and an income of about \$1,400,000. Executive offices are at 50 East Huron street, Chicago, Ill. During 1956, David H. Clift, executive secretary, and Mrs. Grace T. Stevenson, associate executive secretary, headed a staff of 100 working in Chicago and in the Washington, D.C., office, and were assisted by more than 700 members of voluntary committees and other membership groups.

The midwinter meeting was held in Chicago, Jan. 29-Feb. 4. On June 17-25, Miami Beach, Fla., was host to 2,900 librarians in the first annual conference to be held in the south since 1937. During 1956 the association devoted much of its energy to its own reorganization. The basic purpose of the reorganization, which involved every phase of membership and organizational activity, was to provide for better co-ordination of association activities, partly through the reorganization of existing divisions, boards, round tables and committees, and partly through the creation of new divisions and committees.

In its first year of operation, the Library-Community project, an adult education activity made possible by a grant from the Fund for Adult Education, developed intensive programs in Kansas, Maryland, Michigan and Tennessee. A pilot library in each state studied itself and its community as a base for a long-term program in adult education. Simultaneously, the special adult education concerns of other libraries in these states were

met by workshops, publications and self-study procedures.

An International Relations office was established within the A.L.A. for the period 1956-59 by a grant from the Rockefeller foundation. Intended to encourage United States participation in the development of library services abroad, the specific function of the new office was to determine by means of study and on-the-spot investigation the state of library development and the need for library education in various countries.

A comprehensive new document, *Public Library Service to America, a Guide to Evaluation, With Minimum Standards*, prepared by the Public Libraries division, was presented to and adopted by the A.L.A. council at the Miami Beach conference.

The Library Services bill for extension of rural library facilities was enacted into law in 1956, climaxing a ten-year effort by the A.L.A. for passage of this legislation. At the annual conference, Sen. Lister Hill of Alabama was made an honorary life member by act of council, in recognition of his long-standing leadership in the struggle to secure passage of the Library Services act.

The annual Joseph W. Lippincott award for distinguished service in the profession of librarianship (\$500) was won by Ralph A. Ulveling, director of the Detroit (Mich.) Public library. The Melvil Dewey medal for creative professional achievement was won by Norah Albanell Mac-Coll, reference librarian of the Columbus Memorial library, Pan American union, Washington, D.C., for her translation into Spanish of the 15th edition of the *Dewey Decimal Classification*. Mrs. Otis G. Wilson of Huntington, W.Va., and Judge Eugene A. Burdick of Williston, N.D., received the A.L.A. citations for distinguished service as library trustees. The Margaret Mann citation was awarded to Susan Grey Akers of Chapel Hill, N.C., for outstanding professional achievement in cataloging and classification.

The 35th Newbery medal was given to Jean Lee Latham of St. Petersburg, Fla., for *Carry On, Mr. Bowditch*, judged to be the most distinguished children's book of 1955. The Caldecott medal was awarded to Feodor Rojankovsky of Bronxville, N.Y., for the illustrations in *Frog Went a-Courtin'*.

The E. P. Dutton-John Macrae award for advanced study in the field of library work for children and young people (\$1,000) went to John F. Huebler, assistant librarian, University Elementary school, University of Michigan, Ann Arbor. The Grolier Society award (\$500) was presented to Georgia Sealoff, librarian of the West Seattle (Wash.) High School library for her work with the boys and girls of her community. The University of Kansas library won the *Letter* library award (\$100) for an exhibition and catalogue of banned books. Sister Jane Marie Barbours, C.D.P., director of Our Lady of the Lake Library school, San Antonio, Tex., received the *Letter* librarian award (\$100) for her role in fostering appreciation of books among teen-agers in Texas, as a teacher and as a professional leader. The first Beta Phi Mu award (\$50) to be presented by A.L.A. was won by Margaret I. Rufsvold, director of the division of library science, Indiana university, Bloomington, for her work as author, editor and consultant, particularly in the field of audio-visual materials. Fourteen libraries of all types were winners of John Cotton Dana publicity awards, sponsored by the *Wilson Library Bulletin* and the A.L.A. Public Relations committee for effective public relations programs.

(See also LIBRARIES.)

(S. SH.)

American Literature. American literature in 1956 gave only infrequent cause for celebration to discerning readers. No striking new talents emerged, although many younger writers showed competence and incisive analytical power. Older masters such as Ernest Hemingway and William Faulkner published no major new works. American lit-

erature for the year, as contrasted with the flooding output of mass communications industries, was alive and moving forward but at a pace neither rapid nor spectacular.

American problems both domestic and foreign were considered. The situation of the American Negro brought forth a number of studies, including some of durable value. The problems of the presidency and of elections in a democracy, the record of the Franklin D. Roosevelt and Dwight D. Eisenhower administrations and the friction points in foreign relations were covered with varying degrees of scholarly and journalistic competence.

The American business executive, until recent years branded with the mark of Babbitt, had become the object of much sociological investigation and was the hero of one of the year's best-selling novels—Cameron Hawley's *Cash McCall*.

American poetry lived on largely as an academic avocation. Wit, sensitivity and the discipline of traditional form had by 1956 almost totally displaced the obscurantism of a few years before, but no major audience had been reached.

The Foreign Scene.—Continuing world tensions directed many writers toward foreign problems. Richard Wright's *The Color Curtain: A Report on the Bandung Conference* described the hopes, grievances and possible future alliances of the people represented there. Edmund Wilson's *Red, Black, Blond and Olive* perceptively studied four civilizations: Zuni Indian, Haitian, Soviet Russian and Israeli.

Two books on past events with important current overtones were *The Meaning of Yalta*, analyzed by John F. Snell, Forrest C. Pogue, Charles F. Delzell and George F. Lansen; and *Russia Leaves the War*, vol. i, *Soviet-American Relations, 1917-1920*, by former U.S. ambassador to the U.S.S.R. George F. Kennan. Other books on Russian themes were *Soviet Russian Nationalism* by Frederick C. Barghoorn and *The Permanent Purge: Politics in Soviet Totalitarianism* by Zbigniew K. Brzezinski. William O. Douglas' *Russian Journey* revealed particular insight into Soviet Asia and Russian courts and justice.

Oil in all its implications was the theme of two books: Benjamin Shwadrin's *The Middle East, Oil and the Great Powers* dealt with rivalry for production and control; Harvey O'Connor in *The Empire of Oil* criticized the domestic and foreign policies of U.S. companies.

Chester Bowles in *The New Dimensions of Peace and American Politics in a Revolutionary World* urged a new, more flexible foreign policy.

The American Scene.—Executive life in the United States in all its aspects was subjected in 1956 to microscopic examination. C. Wright Mills's *The Power Elite*, a major sociological work, made such an examination as part of his analysis of the structure of power in the United States. More limited in scope but packed with detailed information were *Big Business Leaders in America* by William Lloyd Warner and James C. Abegglen and *The Big Business Executive: The Factors That Made Him, 1900-1950*, by Mabel Newcomer. A quiet, incisive book, *The American Business Creed*, by Francis X. Sutton, Seymour E. Harris, Carl Kaysen



HYPNOSIS PARTY, a form of parlour entertainment which attained some popularity in the U.S. in 1956 after the publication of the best-selling book *The Search for Bridey Murphy* by Morey Bernstein, a Colorado businessman. An amateur hypnotist, Bernstein claimed to have carried a subject back to a former life in Ireland in the early 19th century. In the photograph a girl who has stiffened her body through hypnotist suggestion is able to support the weight of a man without feeling it; note the rigidity in her arm and fingers

and James Tobin critically analyzed the business image of itself and society. The editors of *Fortune* presented in *The Executive Life* accounts of executive activity at home and in the office. And A. C. Spector'sky's artful blend of humour and scholarship in *The Exurbanites* uncovered the folkways of Madison avenue's advertising executives.

Several books prompted by the 1956 elections were noteworthy. These included Robert J. Donovan's *Eisenhower: The Inside Story*, based on minutes of U.S. cabinet meetings and other confidential documents; *Affairs of State: The Eisenhower Years* by Richard Rovere; *A Republican Looks at His Party* by Undersecretary of Labor Arthur Larson; *A Democrat Looks at His Party* by former U.S. Secretary of State Dean Acheson; and *Professional Public Relations and Political Power* in which Stanley Kelley, Jr., demonstrated how advertising experts influence election campaigns. Two analyses of the power of the presidential office were *The Presidency Today* by Edward S. Corwin and Louis W. Koenig and *The American Presidency* by Clinton Rossiter.

More general political ideas appeared in: *The Blessings of Liberty*, Zechariah Chafee's discussion of American freedoms; *Revolt of the Moderates*, in which Samuel Lubell found a shift of U.S. voters from both left and right extremes toward a central political position; *The New American Right*, edited by Daniel Bell, which sought to explain the McCarthyite mentality; Eric Goldman's *The Crucial Decade, America, 1945-1955*, a swiftly paced survey of the last ten years; and *Profiles in Courage*, John F. Kennedy's incidents of political heroism.

Report on Blacklisting, vol. i, *Movies*, and vol. ii, *Radio-Television*, by John Cogley, embodied the results of a two-year study sponsored by the Fund for the Republic. Another fund was scrutinized by Dwight MacDonald in *The Ford Foundation: The Men and the Millions*.

Robert Penn Warren's *Segregation: The Inner Conflict in the South* revealed through direct interviews the divisions and anxieties of the south. *How Far the Promised Land?* demonstrated the optimistic philosophy of the Negro leader Walter White. *Notes of a Native Son*, by James Baldwin, was a Negro writer's sensi-

tive examination of the American scene. *Goodbye to Uncle Tom*, by J. C. Furnas, told of the Negro's effort to break through the fog of myth and prejudice.

Youth: The Years From Ten to Sixteen, by Arnold Gesell, Frances L. Ilg and Louise Bates Ames, completed the massive study of growth patterns of "normal" middle-class children begun by the authors in 1943.

Books on Sigmund Freud marked his centennial year. *Freud: The Man and His Mind, 1856-1956*, by Richard L. Schoenwald, traced the development of Freud's ideas in relation to the period in which he lived. In *Freud and the Crisis of Our Culture*, Lionel Trilling critically examined Freud's theory of the individual's relation to his culture. *Eros and Civilization* by Herbert Marcuse re-examined the Freudian thesis of inevitable conflict between civilization and human instinct.

A number of illuminating biographical sketches and reminiscences appeared. There was Grace Hegger Lewis' *With Love From Gracie: Sinclair Lewis: 1912-1925* with its intimate pictures of Sinclair Lewis in his most creative years; Van Wyck Brooks's poignant *Helen Keller: Sketch for a Portrait*; Julia Smith's *Aaron Copland: His Work and Contribution to American Music*; and John I. H. Baur's *Charles Burchfield*, a critical account with reproductions of the artist's work.

Among books on the natural world were: *The Edge of the Sea* by Rachel Carson; *The Changing Universe*, a presentation of the new field of radioastronomy, by John Pfeiffer; *The World We Live In*, a popular and impressive book by the editors of *Life* and Lincoln Barnett; and four volumes issued by the editors of *Scientific American: Automatic Control, First Book of Animals, New Astronomy* and *Physics and Chemistry of Life*.

Gilbert Seldes weighed the influence of mass communications mediums (particularly television) in *The Public Arts*. Views of two leading architects were put forth in Frank Lloyd Wright's *An American Architecture* (an anthology) and Richard Neutra's *Life and Human Habitat*. A valuable guide to the musical world was provided by B. H. Haggin in *The Listener's Musical Companion*. Selden Rodman in *The Eye of Man: Form and Content in Western Painting* attacked the formalist trend in modern painting. Two books rich in theatrical history were *Form and Idea in Modern Theatre* by John Gassner and *Mrs. Fiske and the American Theatre* by Archie Binns and Olive Kooker. Finally, a bitter and authentic document came from singer Billie Holiday in her autobiographical *Lady Sings the Blues*.

Historical Works.—Marking the 250th anniversary of Benjamin Franklin's birth, Leonard W. Labaree and Whitfield J. Bell, Jr., issued *Mr. Franklin: A Selection From His Personal Letters*. This volume, presenting Franklin in the full richness of his many interests, was a sampling from the monumental 25-volume *The Papers of Benjamin Franklin* on which the editors were engaged. Two other commemorative Franklin books were *The Secret War of Independence* by Helen Augur and *Ben Franklin's Privateers* by William Bell Clark. Both were accounts of Franklin's off-the-record arrangements for French, Dutch and Spanish help against British sea power.

Other significant works dealing with the early United States were vol. xi and xii (covering the period between 1787 and 1788 when Thomas Jefferson was U.S. minister to France) in *The Papers of Thomas Jefferson*, edited by Julian P. Boyd and associates. Samuel Flagg Bemis with *John Quincy Adams and the Union* completed his two-volume biography of the sixth president.

Continued literary attention was focused on the Civil War. *The Living Lincoln*, edited by Paul M. Angle and Earl Schenck Miers, condensed in one volume the eight-volume set of Lincoln's works published three years before. *The Gray Fox: Robert E. Lee and the Civil War*, by Burke Davis, presented the climactic period of Lee's life, the years 1861-65. A shorter book covering

a longer span was *Robert E. Lee* by Earl Schenck Miers.

An attempt, largely successful, to restore Thaddeus Stevens to a high place in history was undertaken by Ralph Korngold in *Thaddeus Stevens: A Being Darkly Wise and Rudely Great*. Ruth Painter Randall managed a sure, intimate portrait of Lincoln family life in *Lincoln's Sons*. In *The Militant South, 1800-1861*, John Hope Franklin gave an original account of the cult and practice of violence in the south. Kenneth Stamp in *The Peculiar Institution* destroyed many myths perpetuated in defense of slavery.

In *Old Bullion Benton, Senator From the New West: Thomas Hart Benton, 1782-1858*, William Nisbit Chambers reappraised a hitherto neglected senatorial giant of the pre-Civil War period. John Higham's *Strangers in the Land: Patterns of American Nativism, 1860-1925*, presented some bitter truths about America's reception of immigrants.

Frank Freidel published the third volume, *Franklin D. Roosevelt: The Triumph*, of his monumental biography. This volume covered the years 1929-32. In *Roosevelt: The Lion and the Fox*, James MacGregor Burns charted the course of Franklin D. Roosevelt's flexible political genius. Richard Hofstadter's *The Age of Reform: From Bryan to F.D.R.* critically re-examined the tradition of American liberalism. Volume ii of the *Memoirs of Harry S. Truman* covered the turbulent years 1946 to 1952. Some of the same events were discussed by Maj. Gen. Courtney Whitney in *MacArthur, His Rendezvous With History*.

Fiction.—Few novels or short stories of 1956 were marked either by the vehemence of social protest or the sweep of literary innovation. Instead, there was a generally high level of technical competence and an increasingly subtle analysis of character.

Most U.S. writers seemed to have made peace or at least a working truce with their own backgrounds. John O'Hara in *Ten North Frederick* and *A Family Party* accepted the milieu of a small Pennsylvania town for his narrative with no suggestion of satire or protest. His compelling concern was not with social environment; it was with the inner drama of his characters which surged behind the façade of manners and status.

Such a bent for analysis marked many works of fiction. Wright Morris in his *Field of Vision* focused on his characters' inner symbolism, ignoring their Main street environment. In *A Season to Beware* William Du Bois probed the life patterns flowing under the flannel suitings of New York's Madison avenue. Irwin Shaw in *Lucy Crown* portrayed, not always credibly, the psychic wounds and long inner dramas following a wife's infidelity. Laura Behler in *Paper Dolls* uncovered the childhood roots of a woman's failure and defeat in life. A group of intellectuals expatriated to Cape Cod were ironically dissected in Mary McCarthy's *A Charmed Life*. Flight to New York brought no salvation for the disconsolate southern poet in Caroline Gordon's *The Malefactors*. Salvation came only after a return to the south and a readjustment facilitated by the Roman Catholic faith.

Some regional coloration was presented in such books as Borden Deal's *Walk Through the Valley*, Hoke Norris' *All the Kingdoms of the Earth*, Ruth Moore's *Speak to the Winds*, Margaret Boylen's *The Marble Orchard* and Grace Metalious' *Peyton Place*.

Two novels dealt effectively with the American political scene: Edwin O'Connor in his *The Last Hurrah* found much good in the career of a big city political boss. Eugene Burdick in a first novel, *The Ninth Wave*, drew a violent picture of California's political life.

Comedy and humour were not strongly represented in the year's fiction. Peter De Vries almost affectionately satirized suburban life in *Comfort Me With Apples*. Mark Harris' (Henry W. Wiggen, pseud.) picture of a baseball team in *Bang the Drum*

Slowly had idiomatic veracity, but its blend of comedy and tragedy was sometimes inept. William Brinkley's *Don't Go Near the Water* enjoyed some popular success.

American fiction in 1956 was not without sounds of dissent and question. John Hersey in *A Single Pebble* balanced an ancient Chinese culture against the values of an American engineer and dam builder. John Howard Griffin in *Nuni* dropped an academic leader into the midst of a primitive Pacific island tribe.

Nelson Algren's picaresque *A Walk on the Wild Side* stated an acid dissent from most of society's established values. Herbert Gold struck a similar note in *The Man Who Was Not With It*. David Karp wrote with strong anger and satire in *All Honorable Men*.

Historical novels, garnished with décolletage, continued to be a major product of the publishing business. At a higher level were Guy Endore's *The King of Paris* (Dumas, père et fils); Pearl Buck's *Imperial Woman* (the last empress of China); Kenneth Roberts' *Boon Island* (shipwreck off the Maine coast); Mary Lee Settle's *O Beulah Land* (American frontier); and Harold Sinclair's *The Horse Soldiers* (Civil War).

Few distinguished collections of short stories were published in 1956. Exceptions were Mavis Gallant with *The Other Paris*, and J. F. Powers with *The Presence of Grace*. James T. Farrell published *French Girls Are Vicious*, and *Other Stories*. *New Short Novels*, 2 presented works by four writers of merit: Norman Mailer's *The Man Who Studied Yoga*; John Phillips' *The Engines of Hygeia*; Dachine Rainer's *A Room at the Inn*; and Wallace Stegner's *Field Guide to the Western Birds*.

Scholarship.—The year 1956 saw major publications of letters, biographies and autobiographies of American writers. Among *The Selected Letters of Henry James*, edited with an introduction by Leon Edel, nearly half had been previously unpublished. *Henry James; Autobiography*, edited by Frederick Dupee, brought together in one volume three separate volumes long out of print. *The Letters of Thomas Wolfe*, edited by Elizabeth Nowell, offered materials for a deeper understanding of Wolfe's vehement career. H. L. Mencken's *Minority Report: [His] Notebooks* presented some of his later work. *The Stature of Theodore Dreiser*, edited by Alfred Kazin and Charles Shapiro, brought together critical and biographical essays on Dreiser. Edward Wagenknecht relied extensively on new documentation for his *Longfellow: A Full-Length Portrait*.

In *The Raven and the Whale*, Perry Miller recreated the New York literary scene and critical controversies before 1850. *The American Adam*, by R. W. B. Lewis, traced the "new man in a bright new world" theme in American writing. Turning to a later period, Walter Rideout in *The Radical Novel in the United States, 1900-1954* successfully related the novel of social protest to main historical currents of the 20th century's first three decades. In *The Cycle of American Literature*, Robert E. Spiller regarded literary history as "symbolic illumination" for social and intellectual history. Alfred Kazin collected penetrating essays on 20th-century literary figures in *The Inmost Leaf*.

Margaret Just Butcher's *The Negro in American Culture*, based on materials collected by Alain Locke, traced the contribution of the Negro to American life. Fresh insight on Africa came from the social scientists whose work was collected in *Africa in the Modern World*, edited by Calvin Stillman. Margaret Mead in *New Lives for Old* told how a primitive people, first visited by outsiders in 1928, had adopted a whole new culture by 1953.

Charles McLean Andrews by Abraham Eisenstadt was a study of that noted historian's work and of the nature of historical writing. *Testament of a Liberal*, by Albert Léon Guérard, was the search for meaningful contemporary liberalism. In *American Paradox: The Conflict of Thought and Action*, Merle Curti analyzed the current distrust of the intellectual. Two books by

Americans on "the great discovery" were biblical scholar Millar Burrows' *Dead Sea Scrolls* and critic Edmund Wilson's *The Scrolls From the Dead Sea*.

Three important reference works were: The first volume, A-B, of *Bibliography of American Literature*, compiled by Jacob Blank; *The Oxford Companion to American Literature*, newly revised by editor James D. Hart; and *The World of Mathematics*, four volumes of selections from leading mathematicians edited by James R. Newman.

Poetry.—The year 1956 brought no flood tide of poetic creation, even though the work of many younger poets was marked by keen insight and technical competence.

William Carlos Williams published his reflective *Journey to Love*. Consisting of poems written during the last two years, it was greeted deservedly as at the level of his best work. Ezra Pound with *Section: Rock-Drill, 85-95 de los cantares* and Witter Bynner with *Book of Lyrics* continued their antipodal poetic careers.

The Complete Poetical Works of Amy Lowell (formerly in 11 volumes) was published with an introduction by Louis Untermeyer.

Playwright Tennessee Williams brought forth a volume of poetry, *In the Winter of Cities*. Richard Wilbur's *Things of This World*, Edwin Rolfe's *Permit Me Refuge* and Paul Engle's sonnet sequence *American Child* were well received. Melville Cane's work was collected in *And Pastures New*.

Distinctive work appeared also from less well-established American poets. This included John Ashbery's *Some Trees*; Helen Bevington's *A Change of Sky, and Other Poems*; Donald Hall's *Exiles and Marriages*; Chester Kallman's *Storm at Castelfranco*; Ernest Kroll's *Pauses of the Eye*; Adrienne Cecile Rich's *The Diamond Cutters, and Other Poems*; George Scarbrough's *Summer So-Called*; and Reed Whittemore's *An American Takes a Walk, and Other Poems*.

Poets of Today, III continued the annual publication of selected new poets. Represented in 1956 were Lee Anderson with *The Floating World*; Spencer Brown with *My Father's Business*; and Joseph Langland with *The Green Town: Poems*. Editor George P. Elliott in *Fifteen Modern American Poets* arbitrarily allotted 20 pages to each poet, with varying results.

(See also BOOK PUBLISHING AND BOOK SALES; CHILDREN'S BOOKS; ENGLISH LITERATURE; LITERARY PRIZES.)

(H. M. H.)

American Mathematical Society: see SOCIETIES AND ASSOCIATIONS, U.S.

American Medical Association: see SOCIETIES AND ASSOCIATIONS, U.S.

American Optometric Association: see SOCIETIES AND ASSOCIATIONS, U.S.

American Physical Society: see SOCIETIES AND ASSOCIATIONS, U.S.

American Prison Association: see SOCIETIES AND ASSOCIATIONS, U.S.: *American Correctional Association*.

American Society of Agricultural Engineers: see SOCIETIES AND ASSOCIATIONS, U.S.

American Society of Civil Engineers: see SOCIETIES AND ASSOCIATIONS, U.S.

American Society of Composers, Authors and Publishers: see SOCIETIES AND ASSOCIATIONS, U.S.

American Society of Heating and Air-Conditioning Engineers: see SOCIETIES AND ASSOCIATIONS, U.S.

American Society of Mechanical Engineers: see SOCIETIES AND ASSOCIATIONS, U.S.

American Sunday-School Union: see SOCIETIES AND ASSOCIATIONS, U.S.

American Veterans' Committee: see VETERANS' ORGANIZATIONS, U.S.

American Veterans of World War II and Korea (Amvets): see VETERANS' ORGANIZATIONS, U.S.

Anaemia: see BLOOD, DISEASES OF THE.

Andorra. An autonomous principality between France and Spain, Andorra is bounded north by the *départements* of Ariège and Pyrénées-Orientales and south by the Spanish province of Lerida. Area: 175 sq.mi. Pop. (1954 census): 5,664. Language: Catalan. Religion: Roman Catholic. Capital: Andorra-la-Vella (Catalan) or Andorra-la-Vieja (Spanish); pop. (1954 est.) 600. Coprinces: the president of the French republic and the bishop of Urgel, Sp., respectively represented by their *viguers* (deputies), Jean Menant (France) and Jaime Sansa Nequi (Spain). An elected general council of 24 members appoints one of its members as the *syndic général des vallées* (from 1946, Francisco Cayrat).

History.—Although uneventful politically, the year 1956 was satisfactory economically. During the summer there was a notable increase in the traffic of private cars as well as of motor coaches from Toulouse, Perpignan and Barcelona. More foreign tourists visited the principality than in the best of previous years.

Economy.—No budget or taxes. Telephone system built and maintained by Radio Andorra (1954, about 100 subscribers). Roads maintained by Forces Hydro-électriques d'Andorre S.A. (Fhasa). Cigarette factory with yearly turnover of about 50,000,000 pesetas. Duties collected on imported goods in 1952, about 2,250,000 pesetas. Monetary unit: French franc and Spanish peseta.

Angling. In the fiscal year July 1954 to July 1955, fishing-licence sales continued to climb. A total of 18,854,809 men and women paid a record-breaking \$39,501,838 for all categories of state licences, permits and stamps. Four states—California, Michigan, Minnesota and Wisconsin—again went over the 1,000,000 mark in licence holders.

The 1956 championship tournament of the National Association of Angling and Casting Clubs was held at San Francisco, Calif., Aug. 8–12. The distance trout fly event was won by Jack Crossfield of San Francisco with a long cast of 168 ft. and an average of 162½ ft. The ¾-oz. bait-casting event was taken by Robert Budd, of Jeffersonville, Ind., with a long cast of 369 ft. and an average of 357½ ft. The ¾-oz. bait-casting event was won by W. J. Lovely, of St. Louis, Mo., with a long cast of 386 ft. and an average of 374 ft. The distance salmon fly event was won by Jon Tarantino of San Francisco with a long cast of 207 ft. and an average of 195½ ft. Tarantino also won the Skish distance fly event with a long cast of 159 ft. and an average of 151½ ft.

A team of British anglers from six different parts of the commonwealth won the 13th International Tuna Cup match at Wedgeport, N.S., Sept. 12–14, 1956. Eight teams competed for the Alton B. Sharp cup.

The International Game Fish association announced two all-tackle records. A 120-lb. 8-oz. amber jack was taken on Oct. 25, 1955, at Kona, T.H. by C. W. McAlpin. A 92-lb. black drum fell to J. Aaron on Aug. 27, 1955, at Cambridge, Md. *Field and Stream* magazine announced three new fresh-water records. An 11-lb. 15-oz. smallmouthed bass was taken by David L. Hayes on July 9, 1955, from Dale Hollow lake, Kentucky. A 360-lb. white sturgeon was caught in the Snake river, Idaho, on April 24, 1956, by Willard Cravens. A 14-lb. 14-oz. arctic charr was caught off Baffin Island, N.W.T., by Bartlett A. Taylor on July 9, 1955.

(A. J. ME.)

Anglo-Egyptian Sudan: see SUDAN.

Angola: see PORTUGUESE OVERSEAS TERRITORIES.

Animal Fats: see VEGETABLE OILS AND ANIMAL FATS.

Animal Industry, Bureau of: see VETERINARY MEDICINE.

Anniversaries and Centennials: see CALENDAR, 1957, page 64.

Antarctica. By the close of 1956 only one-half the 5,100,000 sq.mi. of area comprising the antarctic continent had been seen by man since it was first sighted by the New England sealing captain Nathaniel Brown Palmer in 1821. The continental land mass lies almost entirely within the Antarctic circle; it is somewhat circular in outline except for two indentations, the Ross sea and the Weddell sea, where easy ship entry to the coastal shores is possible in summer. Other areas are difficult to ship navigation, particularly during nine to ten months of the year when pack-ice floes, intermingled with glacial and tabular icebergs assisted by low temperatures, are cemented into one solid impenetrable mass. Nine-tenths of the interior area of the continent is snow- and ice-covered, with glaciers flowing seaward and giving birth to icebergs along the shore line. Scattered rock outcrops and mountain ranges up to 14,000 ft. high cross the continent as the continuation of mountain chains originating in South America and New Zealand. The known portion of the continent has an average elevation of 5,000 ft. above sea level. The south pole is located on a smooth, snow-covered plateau about 10,000 ft. high.

History.—Scientific organizations throughout the civilized world agreed to make synoptic geophysical observations between July 1, 1882, and July 1, 1883. This project, known as the International Polar year, was repeated 50 years later, 1932–33. However, the acceleration of scientific achievement and the solar prospectus for 1957–58 impelled the International Council of Scientific Unions to advance the next phase of its program by 25 years. Hence, a period of scientific activities was planned, designated the International Geophysical year, 1957–58, in which 55 nations would participate in a world-wide scientific investigation of the earth's sciences.

Eleven of these nations announced their intentions to set up bases on the antarctic continent and on a few of its offshore islands. Chile, Argentina and Great Britain intended to utilize their established bases on the Palmer peninsula, which had been in continuous occupation since 1944. During the 1955–56 antarctic summer season, the British set up two additional bases at the southeast corner of the Weddell sea on Edith Ronne Land. The International Geophysical year group, using the Norwegian ship "Tottan," set up the Halley bay base and manned it with ten men, while a private British group, under Vivian E. Fuchs and with Sir Edmund Hillary (the conqueror of Mt. Everest), with the "Theron," built the Shackleton base. This base was located about 40 mi. E. of the Argentine General Belgrano base, which was manned by seven men. At Shackleton base, eight men wintered in 1956 and advanced caches of food and gasoline in the interior for use on the planned transantarctic tractor party's journey to McMurdo sound in the Ross sea, via the south pole, during the 1957–58 summer. A support party was being planned to operate from McMurdo sound, to assist the main party in the latter part of the journey.

In Jan. 1956 a French group, under Paul Emile Victor, with the Norwegian sealing ship "Norsel," reoccupied its base with 20 men in the French-claimed sector of Adélie Coast. The group planned to establish a field base about 250 mi. inland toward the south pole as another link in the network of stations during the International Geophysical year program.

In Jan. 1956 the Argentine icebreaker "General San Martin" replaced the wintering personnel at the General Belgrano base, the southernmost station in the Argentine-claimed sector of the antarctic, where the Argentinians prepared to participate in the International Geophysical year program.

On Jan. 6, 1956, the first Russian expedition to the antarctic

in 135 years reached Farr bay on Queen Mary Coast in the flagship "Ob." There the expedition established Mirny base, leaving 32 men to arrange for the Soviet part in the International Geophysical year program. On May 27, 1956, an inland base, Pionerskaya, at an elevation of 9,000 ft., 200 mi. S. of Mirny, was completed and manned by six men. There the coldest temperature in the history of the antarctic was recorded on July 3, 1956, when the temperature fell to -82.3° F. During the return voyage of the Russian ships, scientific personnel conducted extensive oceanographic surveys in the oceans near the continent's shores. The ships stopped in Australia in May before returning to Odessa.

An Australian expedition in the Danish ship "Kista Dan" augmented Australia's facilities in material and personnel at Mawson base on Enderby Land, where 23 men spent the winter in 1956. Geographical discoveries were extended along the Australian-claimed sector, and an additional field station was built about 300 mi. in the interior. A new mountain range was discovered which links this area with earlier discovered features.

The United States government's logistic support in the 1955-56 season was of major proportions in the furtherance of the third International Geophysical year. It was sponsored by the department of defense and the National Science foundation and National Research council. Navy task force 43 launched Operation "Deepfreeze I" to provide logistic support for the antarctic phase of the International Geophysical year program. This consisted of nine ships which departed from New Zealand in mid-December 1955, and proceeded to set up two bases in the New Zealand-claimed Ross sea sector. At Kainan bay, in the eastern part of the Ross ice shelf, Little America V was built as the focal point for all United States activities. Seventy-three men were left to winter there. An air operations base was built at Hut Point in McMurdo sound, where the English explorers Scott and Shackleton had their wintering bases when attempting to reach the south pole in the early 1900s and where 93 Americans were left to winter during the 1956 season. Two navy Skymasters and two Neptunes flew on Dec. 20, 1955, from New Zealand and landed on the sea ice at McMurdo sound. From there they made a number of reconnaissance flights until Jan. 17, 1956, when, because of sea ice conditions, they were forced to return to New Zealand. On a 3,000-mi. round-trip flight to the Weddell sea, a Neptune plane sighted a new mountain range at about 80° S., 50° W., reaffirming observations by Finn Ronne in 1947 that the continent is not divided by a frozen body of water between the Ross and Weddell seas.

The air facility base at McMurdo sound was a key project in the U.S. navy's effort to set up a base at the south pole by aircraft during the months of Nov.-Dec. 1956. Large C-124 Globemaster cargo planes were flown in from New Zealand. Based at McMurdo, they would air-drop equipment at the pole station, where 15 men would winter until Jan. 1959. Similarly, the Byrd base at 80° S., 120° W. was to be established by tractor trains and aircraft during Nov. 1956, and 23 men would occupy this base.

By the first part of March 1956 all ships of the task force had left the antarctic except for the icebreaker "Glacier," which skirted the continent's shores and surveyed Knox Coast where another International Geophysical year station was to be set up in Dec. 1956. Heavy ice prevented the "Glacier" from visiting the Mirny base on Queen Mary Coast. However, a landing was made at Princess Astrid Coast, where a Japanese expedition, under E. E. Nishibori, using the diesel ship "Soya," planned to build an International Geophysical year station manned by ten men in Jan. 1957. Because of the lateness of the season and heavy ice pressures, the "Glacier" was unable to enter the Weddell sea to locate a base site for a fifth United States station,



U.S. NAVY ICEBREAKER unloading cargo at McMurdo sound, Antarctica, Feb. 6, 1956. The cargo was to be stockpiled for use by the U.S. scientists coming to Antarctica for study during the International Geophysical year, 1957-58

to be built in Dec. 1956. Task force 43 was headed by Rear Adm. George Dufek, who also supervised field activities of "Deepfreeze I." Rear Adm. Richard E. Byrd was appointed senior U.S. representative by the department of defense, "charged with maintaining effective monitorship over those political, scientific, legislative, and operational activities which comprise the total United States Antarctic program."

Operation "Deepfreeze II," again under Admiral Dufek, was launched on Sept. 18, 1956, when the "Glacier" again departed from Boston for the antarctic. In New Zealand she was joined by other naval vessels, and by Oct. 17 the ships were in position in the open stretch of ocean between New Zealand and the antarctic continent to safeguard and guide the U.S. air force and navy planes carrying men, supplies and equipment from Christchurch, N.Z., to McMurdo sound. These flights began on Oct. 16, 1956. From McMurdo sound, supplies were to be flown to other bases.

The first landing at the south pole itself was made on Oct. 31, 1956, in a C-47 aeroplane. The party of seven, under Admiral Dufek, remained on the surface for 45 minutes. Because of the high altitude, ten JATO's were necessary to get the plane in the air once again, while the larger Skymaster (four-engine plane) hovered overhead ready to drop emergency equipment should the C-47 be unable to lift off the surface. The temperature on the surface was -58° F. Instead of commencing the air drop of equipment for the pole station immediately, this was postponed till mid-November when higher temperatures were expected. Soon after the polar landing, the biggest air operation in antarctic history commenced. C-124 cargo planes began air-lifting and parachuting 500 tons of equipment for construction of the south pole base. Smaller planes, capable of landing at the 10,000-ft. elevation, brought in construction crews and the more sensitive instruments. The scientists were to be flown to the south pole about Feb. 1, 1957, at which time the construction crews would be returned to McMurdo sound.

The Knox Coast task group, with three ships, under Capt. C. W. Thomas, U.S. coast guard, got under way in early Nov. 1956, with stops at New Zealand, to set up the Knox Coast and Cape Adare stations. The Weddell sea task group, with two ships under Capt. Edwin A. McDonald, U.S. navy, left Punta Arenas, Chile, during the first part of Dec. 1956, to penetrate the Weddell sea pack ice and reach the Bowman peninsula in Edith Ronne Land, where the sixth U.S. International Geophysical year base was to be established and manned until March 1959 by 41 men

under the command of Capt. Finn Ronne, U.S. navy.

The sealing ship "Polarcircle" left Oslo, Nor., in the first week of November for Queen Maud Land where, 25 mi. inland, another International Geophysical year station was to be set up. It was to be manned by 14 men under S. Helle of the Norwegian Polar institute. The British International Geophysical year party and the Fuchs-Hillary group left England on Oct. 10, 1956, in the Danish ship "Magga Dan" with scientists for the Halley bay base and the leaders of the transantarctic tractor party for the Shackleton base. Similarly, the French, the Chileans, the Argentinians and the Australians prepared to resupply their bases with new personnel during the 1956-57 antarctic season. The Soviet expedition ships "Ob," "Cooperationsiys" and "Lena" left Kalinin-grad (Königsberg) in mid-Nov. 1956 for their Mirny base on Queen Mary Coast with replacement of personnel.

(See also GEOGRAPHY; INTERNATIONAL GEOPHYSICAL YEAR, 1957-58.) (F. RE.)

Anthropology. The year 1956 did not show the same type of integration in the field of anthropology which had been manifest previously. The discipline seemed obliged to draw in on itself, to regroup its forces and to explore new avenues of research before attempting to find anew a pattern of common interest. As a result, a summary of the year appeared more as a diverse chronicle of events than a picture of the expanding and vital field of research that anthropology is.

The pattern of diversity became evident in the two major international congresses which were held in the late summer. The 32nd International Congress of Americanists, Copenhagen, Den., Aug. 8-14, lacked a central organizing theme. Although all papers had remote connections with the Americas, there were significant contributions from the Soviet Union on Siberian archaeology and museum reports from various European countries. A session was devoted to glottochronology which established a marked division of opinion between the American and European scholars, the former supporting this new dating technique, the latter finding that it did not concur with their recorded data. Both the Eskimo and the phoneme merited additional study, and the congress re-emphasized this, but did not clarify the direction of research.

The fifth International Congress of Anthropological and Ethnological Sciences, Philadelphia, Pa., Sept. 1-9, continued the pattern of diversity. More than 600 delegates and individuals attended, representing more than 50 countries. For the first time a delegation from the U.S.S.R. was present. Steps were initiated toward intellectual interchange between the Soviet area and the west, and valuable information on Soviet anthropology was presented for the first time.

The most important event at the congress was the formal establishment of the International Union of Anthropological and Ethnological Sciences. Founded on a tentative basis at Brussels, Belg., in 1948, it was both the offspring and the parent of the congress, meeting concurrently with the congress, growing out of it and acting as one of the sponsors. The aim of the union is to maintain permanent relations among anthropologists and ethnologists of all countries, to stimulate international co-operation and to maintain contact with scientific organizations in anthropology and related fields. As constituted, the union was composed of 58 organizations from 24 countries and was governed by an executive committee elected by the general assembly. The union had already established relations with the International Council of Philosophy and Humanistic Studies and was represented in the International Council of Social Sciences.

The American Association of Physical Anthropologists, in its 25th annual meeting April 6-8 in Chicago, Ill., reopened the discussion on the Australopithecinae which had taken place at the

third Pan-African Congress on Prehistory. Participants from England, South Africa and the United States joined in the symposium. The experts tended to place the Australopithecinae on the main lines of human evolution chiefly because of bipedal locomotion and hominid teeth. However, a study made by Lois W. Mednick (*American Journal of Physical Anthropology*, 13:203, June 1955) and endorsed by other scientists reached the conclusion that the australopithecine pelvis showed a condition transitional to erect posture and that the little animals were probably only partially bipedal. In this connection, Cesare Emiliani revised the length of the Pleistocene, based on radiocarbon reports by M. Rubin and H. E. Seuss and ionium dates by Urry. With this scientific information, Emiliani postulated a maximum date of 270,000 years for the beginning of the first Pleistocene glaciation, which made possible rapid evolution of the hominids from the Australopithecinae to *Homo sapiens*, and great ability to speciate (*Science*, 123:924-926). Although this evidence was illuminating, the possibility that the Australopithecinae are a side shoot of human evolution was reinforced by a report of Henri Vallouis (*American Journal of Physical Anthropology*, 14:319-323) on the Montmaurin mandible from Haut-Garonne, Fr. Dated either in the second or third interglacial, this jaw shows traits intermediate between the well-known Mauer jaw and the Neanderthal jaw. With the removal of the Piltdown fake from the scene, it is now possible to postulate an evolutionary sequence of large hominid forms from Mauer to Montmaurin to Progressive Neanderthal to *Homo sapiens*, extending from the second glacial period of the Pleistocene to the last glacial period, eliminating diminutive forms from the sequence.

Two other primate forms engaged attention during 1956. The "Abominable Snowman" of the Himalayas returned to scientific notice as the result of a sighting by Slavomir Rawicz (reported in his *The Long Walk*, 1956) and a report by Swami Pranavanda (*Indian Geographical Journal*, 30:99). Conservative scientists tended to the opinion that this animal was a Himalayan red bear, but the alternate opinion was voiced that it was a giant form of orangutan, similar to *Gorilla beringii*. The second primate was called the "Abominable Coalman" by one expert. It was an old find, discovered originally in 1869 by Paul Gervais in lignite mines in the Bamboli mountains of Italy. Identified originally as a monkey, little attention was devoted to the specimens until they were re-examined in 1956 by J. Hurzeler, who brought them to New York city under the auspices of the Wenner-Gren Foundation for Anthropological Research. The specimens represent approximately 12 individuals and were originally called *Oreopithecus*. There seemed to be little argument about their date, which was late Miocene or early Pliocene. Examination of the teeth and the configuration of the jaw fragments revealed that this form had definite hominid suggestions; the canine teeth were reduced, the alveolar profile was orthognathous and the molar structure strongly suggested hominid affinities. Experts were divided, but a minority felt strongly that this primate form stood on the stem of human evolution and was more hominid than simian. The Wenner-Gren foundation was assisting additional excavation in the hope that more cranial fragments and all-important pelvis would be discovered. If the minority contention was supported by additional material, the separation of the primates from the hominids would have to be pushed far back into geological time. In this connection, G. F. Debets reported at the International Congress of Anthropological and Ethnological Sciences a find of late Miocene or Pliocene molar teeth from Georgia, U.S.S.R., which had both pongid and hominid traits. The form was named *Udabnopithecus*. These new discoveries and analyses suggested that the pattern of primate evolution had to have a thorough re-evaluation.

New items on the dating of early finds were contributed by

the radiocarbon technique. At the site of Lewisville, Denton county, Tex., a camp site of more than 14 hearths associated with extinct mammal forms was found. The cultural identification of Llano (Clovis) in such association was not unusual, but the age of 37,000 years produced by the laboratory of the Humble Oil company was unusual (*Science*, 124:396). G. F. Carter reported the discovery of a deposit of mammoth bones associated with fire traces on Santa Rosa Island, California. Radiocarbon dating gave this find an age of 29,000 years (*Science*, 123:259). While radiocarbon stretched the period of occupation of the Americas by man, it seemed to be lowering the dates of the period of occupation of Europe. Rubin and Seuss, reporting radiocarbon dates determined by the U.S. geological survey (*Science*, 123:442), brought the age of the late Magdalenian period of northern Europe to 8,800 years, and the Hamburgian Palaeolithic period to 11,750 years.

Robert Redfield (The University of Chicago) delivered the Huxley memorial lecture at the Royal Anthropological institute in London, Eng., and received the institute's medal.

The annual highest anthropological honours for the year, the Viking fund medals and awards, presented by the Wenner-Gren foundation, went to A. I. Hallowell (University of Pennsylvania), general anthropology; W. E. LeGros Clark (Cambridge university), physical anthropology; and J. E. S. Thompson (Carnegie institution), archaeology.

(See also ARCHAEOLOGY; NATIONAL GEOGRAPHIC SOCIETY.)
(W. S. GY.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Backward Civilization* (1937); *Giant People* (The Watussi) (1939); *Man and His Culture* (1954); *People of the Congo* (The Mangbetu) (1939); *Pygmies of Africa* (1939); *Remnants of a Race* (1955).

Antibiotics: see BACTERIOLOGY; CHEMISTRY; CHEMOTHERAPY; STOMACH AND INTESTINES, DISEASES OF THE.

Antigua: see LEEWARD ISLANDS.

Antimony: see MINERAL AND METAL PRODUCTION AND PRICES.

Apples: see FRUIT.

Apricots: see FRUIT.

Arabia: see ADEN; MUSCAT AND OMAN; PERSIAN GULF STATES; SAUDI ARABIA; YEMEN.

Arab League: see IRAQ; JORDAN; LEBANON; SAUDI ARABIA; SYRIA.

Arboretums: see BOTANY.

Archaeology. **Eastern Hemisphere.**—The archaeological year 1956 was not marked by any highly spectacular find. A symbolic event of considerable importance took place in Athens, Gr., where the 75th anniversary of the founding of the American School of Classical Studies at Athens was celebrated together with the completion of the school's 25 years of excavation in the Athenian agora. On Sept. 3, 1956, King Paul of Greece dedicated the newly completed restoration of the stoa of Attalos II as a museum for the antiquities recovered in the agora.

The year had somewhat unusual archaeological events. The British consul at Syracuse, Sicily, with the aid of diving units of the Italian navy, began the recovery of artifacts from the Athenian fleet which was destroyed in Syracuse harbour in 415-413 B.C. Bernard V. Bothmer of the Boston Museum of Fine Arts, Boston, Mass., with the aid of casts, discovered that the head of a statue of the Egyptian pharaoh Osorkon II in a U.S. museum fitted a body in the Cairo museum. The Norwegian Thor Heyerdahl further convinced himself of links between the makers of the sculpture of Easter Island and the South American Indians. Some other authorities remained sceptical.

Work in the field of philology—the reading and interpretation of ancient written documents—was fruitful. The caves near

Khirbet Qumran in Jordan continued to yield the materials referred to as the Dead sea scrolls. The site of the Essene monastery at Khirbet Qumran itself was being excavated, and a team of British and United States scholars was at work on the scroll fragments in the Palestine Archaeological museum in Jordanian Jerusalem. Few scholars seemed to concur in the implications of John Allegro of the Victoria University of Manchester, Eng., that the crucified Essene "teacher of righteousness" might have been a pattern for Jesus Christ. The cutting open and piecing together of bronze scrolls from cave number three was successful, and revealed a text which spoke of the distribution of several tons of precious metals, buried in about 60 places throughout Palestine.

Further philological work on the newly (1954) deciphered Minoan Linear B texts of Crete and Greece suggested that men named Achilles, Hector, Deucalion and Orestes held land on Crete about 1200 B.C. In Italy, several new Etruscan sites were located with the aid of aerial photography. Renato Bartoccini of Rome, beginning excavations at Vulci (which is known to have been a bilingual city), hoped to recover an Etruscan "Rosetta stone."

Pleistocene Prehistory.—There was unofficial word from the Makapansgat area of South Africa that responsible prehistorians had recovered coarse (but recognizable) stone tools from the strata which yield the bones of the *Australopithecus* man-apes. Previously, claims of tools with the australopithecine fossils had not been generally accepted. The new finds, if truly acceptable, would have considerable bearing on the interpretation of the fossils and on the earliest appearance of a tool-using being.

Alfred Rust reported the recovery of very early stone tools in a gravel pit near Meiningen in east Germany. Convincing stone tools of very early type were also excavated on Hokkaido, Jap., by Johannes Maringer; these included crude pebble tools and also "bifaces" of the Patjitanian type already known from Java.

A few miles northwest of Rome, at Torre in Pietra, A. C. Blanc encountered early types of stone hand axes, in association with an extinct fauna. Blanc was reported to suspect an age equivalent to that of the Java and Peking man finds (middle Pleistocene). Another group of early hand axes was discovered in a fossil spring at Azraq, east of Amman in Jordan.

The usual rather large number of excavations in the cave deposits of Upper Pleistocene times in western and central Europe proceeded. An apparently unresolved controversy surrounded the newly discovered cave paintings at the Rouffignac site near Perigueux, Fr. There, the claims of highly respected French archaeologists that the drawings of prehistoric animals pertain to the Upper Palaeolithic were disputed by speleologists who claimed to have seen no paintings in the cave when they investigated it ten years before.

Ancient Near East.—In Egypt, the clearance of various architectural and epigraphic monuments at Luxor, Karnak, Thebes and Abydos, by both Egyptian and foreign excavators, proceeded. The sarcophagus of a daughter of the 12th-dynasty king Amenemhet III was opened, but contained little save a necklace. The remarkable find of the year was that made by W. B. Emery in the 1st-dynasty cemetery at Sakkara. This was the mastaba tomb of Queen Her-Neit. Incorporated within the normal 1st-dynasty mastaba structure was a low pyramidal brick-covered mound of earth which covered the rock-cut burial shaft itself. Emery suspected that the germ of the idea of the later pyramids might already be present in the low pyramidal brick-covered mound.

Well to the west of Egypt, near the Algerian border with Libya, Henri Lhote discovered a great number of rock drawings, which he believed show evidence of a migration of herdsmen from upper

Egypt. Egyptian-type river boats figure in some of the drawings.

There was considerable archaeological activity on both the Israeli and Jordanian sides of Palestine. Jean Perrot cleared a well-prepared grave, believed to pertain to the Natufian assemblage, near Hazor in upper Galilee. So far, Natufian materials had been identified only in caves.

At Jericho in Jordan, Kathleen Kenyon continued her concentration on the early prepottery levels of the town. She subdivided this manifestation into an earlier "hog-backed brick" and a later "plastered floor" phase. The scale of architectural elaboration, in basal levels as early as Miss Kenyon believed those of Jericho to be, was quite staggering on theoretical grounds. Further early Bronze Age fortification walls and a fine middle Bronze Age tomb were encountered.

The major Israeli effort, under Yigal Yadin, was large-scale clearance at the mound of Hazor. More or less continuous occupation from Hellenistic times back to c. 1400 B.C. was already indicated. A Canaanite shrine with small stelae and a seated figure of a god were encountered.

The Israeli department of antiquities also undertook a survey of the Maccabaeon fortress palace of Masada, where a thousand zealots held off the Roman army for three years. A catacomb of the time of the Roman occupation was cleared at Beth Shearim. Several U.S. scholars did intensive survey in the arid Negev zone, which yielded evidence of how—through dams and channelled catchment basins—the area was once so agriculturally productive.

Two new U.S. expeditions began work in Jordan, one under G. E. Wright at Shechem and the second at Gibeon under J. B. Pritchard. Pritchard began his work on the area of the reservoir and water canal of the site of Gibeon.

In Syria the long-standing work of Claude Schaeffer at Ras Shamra and of André Parrot at Mari were continued. Parrot increased his exposures in the pre-Sargonid levels of his Sumero-Akkadian outpost city on the middle Euphrates. The Syrian directorate of antiquities reported the location of the port town of Semira, often mentioned in the international correspondence of the later second millennium B.C.

In Iraq there was great anticipation concerning the possible appearance of a new royal tomb at Warka (biblical Erech), long under excavation by Heinrich Lenzen for the German Archaeological institute. So far, Lenzen had exposed only the entrances to a walled-up structure of the early dynastic period. Naji al-Asil, director general of antiquities in Iraq, believed the recovery of a royal tomb of the Ur type, but considerably earlier, was "virtually certain."

The important direct yield in Iraq for the year was that of Richard E. Haines's joint Oriental institute-American Schools of Oriental Research expedition at the ancient Mesopotamian holy city of Nippur. There architectural clearance in the sacred area, of the temple of the goddess Inanna and of the ziggurat-Enlil temple compound, traced some of these buildings back to their early dynastic aspect. A number of intact foundation deposits, with bronze figures of the kings Shulgi and Urnammu, were found.

The work of the British School of Archaeology in Iraq, under M. E. L. Mallowan, continued at the ancient Assyrian capital at Nimrud. The exposure of monumental architecture was considerably increased, and important additions were made to the magnificent series of ivory carvings.

The directorate general of antiquities in Iraq was mainly concerned with survey in connection with a salvage archaeology program made necessary by the new public works projects being developed as the result of the intelligent use of oil royalties.

In Iran the University museum of the University of Pennsylvania, Philadelphia, under the directorship of Robert Dyson, undertook a long-range excavation program at the site of Hasanlu,

southwest of Lake Urmia. This important area was almost unknown archaeologically. Trial trenches indicated Sassanid and Parthian upper layers, and painted pottery horizons beginning at about three metres' depth.

In Turkey the major national German, British and U.S. field programs proceeded. At Gordion, the Pennsylvania University museum concentrated mainly on the Phrygian levels of the town, and the main gateway was discovered.

Greece and Rome.—Before the Cyprus troubles began, Saul Weinberg was able to complete his first successful season of the new University of Missouri expedition at Episkopi. As the Cyprus troubles developed, however, their political implications in Greece began to be felt. The British work at Mycenae was postponed, for example. Carl Blegen's University of Cincinnati work at Nestor's Pylos proceeded, however, with most of the palace area itself now cleared. Oscar Broneer, of The University of Chicago, continued work at the temple of Poseidon at Isthmia. The French school continued its work at Argos on a large scale, and the German institute resumed the clearance of the Leonidaion at Olympia. The Greek service was active on the south slope of the Athenian Acropolis, where a new road was being constructed. Late Roman buildings, an apparently Classical and unexpected gate in the city wall and geometric graves were encountered. An early Christian church of some size, possibly that of St. Leonidas, was accidentally discovered by a plowman near Corinth.

A large, unidentified Hellenistic Greek city was under excavation by Erik Sjoqvist for Princeton university at Serra Orlando in Sicily. The agora was unusual, in having been built around a bowl-shaped amphitheatre. Another Hellenistic city, Tolmeta, in Libya, was the scene of continuing excavations by Carl Kraeling of the Oriental institute of The University of Chicago. There a city block, which included a large house, was cleared.

In Italy the event of the year was the discovery, by the Pontifical Commission of Sacred Archaeology, of a new Roman catacomb, small in size but remarkable for the number and beauty of its frescoed paintings. It was probably 4th century A.D. in date. The frescoes depicted a wide variety of Old and New Testament scenes, and experts inferred that one scene was that of an anatomy lesson.

In the Roman provinces, the remains of a large villa-farm, with excellent mosaics, were cleared at Torre de Palma in Portugal. In London, Eng., further excavations in the Walbrook site yielded a large and excellently preserved assortment of Roman tools, hardware, surgical and cosmetic implements and jewelry. Near Cripplegate church, in another portion of the bombed area of the London City, a part of a Roman fort was cleared.

The Byzantine institute uncovered and preserved a magnificent series of frescoes and mosaics in the mosque of Ka'riye in Istanbul. The art was called the best preserved of any of the Palaeologan dynasty.

Europe.—Stuart Piggott of Edinburgh, Scot., continued his exacting excavations at Stonehenge, in Britain. The materials of a fine Celtic grave, at Reinheim, in the Saarland—found accidentally in 1954—showed oriental (e.g., Phoenician or Etruscan?) influence in the decoration of rich gold jewelry. The grave probably dates to the 5th or 4th century B.C. Another rich grave, of a Frankish prince of about A.D. 600, was encountered during open-pit coal mining west of Cologne, Ger. This grave included a magnificent gilt bronze helmet, probably of north Italian workmanship. At Lindholm, in Jutland, the ship-shaped graves of Denmark's largest viking cemetery were investigated.

Asia.—H. D. Sankalia and his associates of Deccan college, Poona, India, were archaeologically active. Excavations on a mound near Nevasa, Ahmednagar district, Bombay state, yielded



Above: H. Wright Baker of Manchester university, England, preparing to cut one of the copper Dead sea scrolls discovered in 1952. Archaeologists and linguists began to publish translations of the contents in 1956

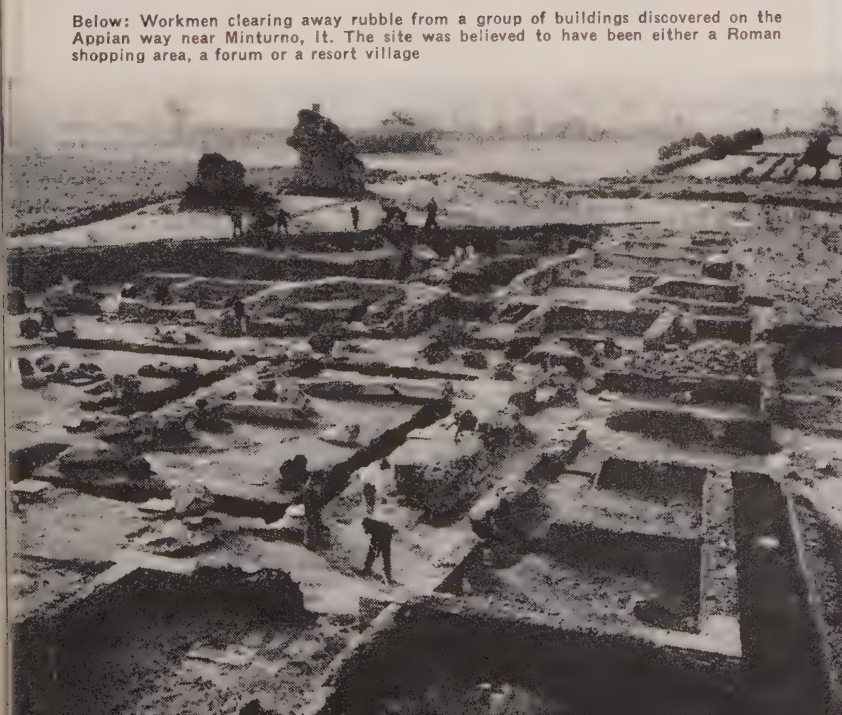


Above: Boy climbing stairs from the pool of Gibeon, an ancient city of Palestine where Joab killed Amasa (2 Sam. xx). The site, near El-Jib, was excavated in 1956 by U.S. archaeologists



Below: 4th-century fresco from a catacomb discovered in a suburb of Rome, It., in 1956. The fresco, showing an ancient anatomy class, was one of about fifty, all well-preserved

Below: U.S. archaeologists of the River Basin surveys of the Smithsonian institution excavating bison bones and stone artifacts at an early Indian camp site on the Marias river, Montana



Below: Workmen clearing away rubble from a group of buildings discovered on the Appian way near Minturno, It. The site was believed to have been either a Roman shopping area, a forum or a resort village



five phases of occupation. The earliest phase included chipped stone and microlithic scale tools, polished stone axes, some coarse and some painted pottery and a few copper tools. The suggested date was c. 1000 B.C. The second phase was dated by coins to the 3rd and 1st centuries B.C., and iron tools were already in use. The third phase showed a development from the second, and Roman trade pieces of glass and pottery were recovered. The two last phases showed aspects of known historic Indian periods. Such a stratigraphically fixed succession for India was of extreme importance.

While it was known that both Russian and Chinese archaeologists were at work in Siberia and Red China, few reports were received of their results. Karakorum, once the capital of Jenghiz Khan, in Outer Mongolia, was said to have been located and excavations begun. A great concentration of granite blocks and glazed tile was identified as the palace of Ogdai, a son of Jenghiz. Reports came through Sweden of a spectacular find of Scythian graves made by Russian archaeologists west of Irkutsk. The bodies in the graves were frozen and still well preserved, and the yield of knowledge concerning clothing, hairdress and personal decoration, as well as physical type, was high. The graves also contained ritually slaughtered horses and quantities of household goods, carpets and jewelry. (See also JUDAISM.)

(R. J. B.)

Western Hemisphere.—The Society for American Archaeology conducted its annual meeting in 1956 at the University of Nebraska, Lincoln, May 3–5. The well-known Mayanist, J. Eric Thompson, of the Peabody Museum of Archaeology and Ethnology, Harvard university, was the society's candidate for the 1955 Viking fund medal and award in archaeology.

In 1956 several hundred American archaeologists, under the aegis of more than 50 institutions and organizations, searched in the earth for solutions to the problems surrounding the time and manner of the peopling of the new world, the growth, spread and decline of Indian cultures, and their complex interrelationships. Much of this activity was of salvage character, imposed by the accelerated destruction of archaeological resources through building expansion, dam and highway construction.

Early Man.—Several recent discoveries and some new radiocarbon dates broadened the conception of probable antiquity and cultural diversity among the earliest American hunters, whose taste for elephant meat was attested by increased archaeological evidence. In the San Pedro valley, near Hereford, Ariz., the attention of the Arizona State museum of the University of Arizona, Tucson, was directed to mammoth bones weathering out of a dry stream bank. In a concentration of bones covering approximately 15 by 30 ft., William W. Wasley, E. B. Sayles, John Lance, Emil W. Haury and ten students from the department of anthropology found scattered remains of at least eight mammoths, mostly young animals, together with a few bones of the early bison, tapir and horse. Among the parts were 13 Clovis projectile points, illustrating the typological range of this pre-Folsom form, and 8 cutting and scraping tools, the latter indicative of food preparation on the spot. Two hearths found in the same bed supported this assumption, and yielded datable charcoal which, when radiocarbon-analyzed, was expected to show that hunters killed and butchered their game more than 10,000 years ago.

Much more doubtful were the dwarf mammoth discoveries in California which had continued from 1947. This Pleistocene or Ice Age species, standing four to six feet high, seemed to have been killed in large numbers by other and earlier people than the palaeo-Indian makers of the Clovis points; indeed, no weapons had come to light, although one chipped stone artifact and occasional occurrences of abalone shells among the bones were reported. The remains of many of these mammals were exposed

along the northwest coast of Santa Rosa Island, off the Santa Barbara coast in southern California, buried about midway down in 75-ft. sea cliffs composed of late Pleistocene sediments. In many cases the surrounding clay was burned brick red and contained charcoal particles, which, together with the disarticulated, selectively broken and sometimes burned condition of the bones, strongly suggested the predation of human hunters.

In Sept. 1955 the Santa Barbara Museum of Natural History secured the co-operation of a group of specialists from the Western Speleological institute, the Scripps Institution of Oceanography of the University of California, La Jolla, and the Lamont Geological observatory of Columbia university. Burned mammoth bone, collected by Wallace Broecker of the latter institution and radiocarbon-analyzed, revealed the astonishing age of $29,650 \pm 2,500$ years, suggesting an even greater antiquity for this site than for the camel hunters' camp in Nevada (dated at more than 23,800 years). To account for how man in an apparently primitive cultural status managed to reach Santa Rosa Island, 30 mi. from the nearest coast, the hypothesis was advanced that in glacial times, when large amounts of water from the sea were known to have been locked up in thick and extensive sheets of continental ice, the sea level would have been lowered by at least the 120 ft. necessary to allow passage by foot from the mainland.

In the vicinity of Lewisville, Tex., R. K. Harris, Wilson W. Crook, Jr., and other members of the Dallas Archeological society discovered in Feb. 1956 a series of ten ancient hearths in an Upper Pleistocene formation, believed to correlate with the latest of the main periods of glaciation in the northern United States and Canada. These features consisted of basin-shaped pits 4 to 10 ft. in diameter and up to 18 in. deep, filled with burned earth and charcoal. A classic specimen of Clovis fluted point was trowelled out of the largest hearth, and the site as a whole contributed significant additional data on the food habits of the Clovis people. Besides the usual extinct large game animal bones associated with such points, remains of the tortoise, rabbit, deer or antelope, various birds and even mussel and snail shells showed that, even in a period of presumable game abundance, practically everything which came to hand was eaten.

Arctic.—Under sponsorship of the Smithsonian institution, the National Museum of Canada, the National Geographic society and the American Philosophical society, two major expeditions conducted excavations at five sites in Coats and Southampton Islands in Hudson bay, Canada, in the summers of 1954–55. Henry B. Collins headed parties which at various times consisted of J. Norman Emerson, William E. Taylor, Jr., Eugene Ostroff and James V. Wright. Near Native Point on Southampton Island, stone and sod house ruins, graves, stone caches and cairns of the recent Sadlermiut Eskimo were explored, but more significant were discoveries illustrating a long antecedent Eskimo culture stage known as the Dorset. The archaeologists were exceptionally fortunate in uncovering an early Dorset village of large size, composed of shallow refuse deposits rich in artifacts of stone, bone and ivory. At this level of Eskimo cultural development, radiocarbon-dated at $2,000 \pm 230$ years ago, dog sled transportation was unknown. The people, unable to pursue other game in winter, subsisted largely upon seal, walrus and fox, as attested by the midden contents.

Richard S. MacNeish of the National Museum of Canada dug again in 1956 at the Firth river site near the Alaskan-Canadian border in Yukon territory, on a deeply stratified site which contains one of the longest archaeological records known from the Arctic. Nine superimposed culture layers are represented, the upper three referable to the Eskimo, the middle three apparently bearing on the introduction of pottery and the lower three depicting the handiwork of a variety of primitive hunters. It appeared

both from the geographical and industrial evidence that this station on the narrow coastal plain had been visited by many of the early migrants from Asia.

Pacific Coast and Great Basin.—The University of Utah, Salt Lake City, summer field school, under the direction of Jesse D. Jennings and Dee C. Taylor, conducted excavations between Salina and Emory, Utah, at two open village sites of the Fremont culture. Only one such village had previously been explored. Strong cultural influences from the southwest into the Great Basin area were shown by the finds of masonry houses, adobe granaries, pottery and clay figurines.

In British Columbia, Charles Borden's work for the University of British Columbia, Vancouver, at the Marpole site resulted in a radiocarbon-dating of the lower level at about $1,950 \pm 125$ years ago. Since elk antler wedges, stone adz blades and stone mauls were found in this horizon, it is probable that the impressive woodworking industry of the northwest coast Indians was already established there 2,000 years ago.

Plains.—The western Canadian plains received belated archaeological attention under the auspices of the Glenbow foundation of Calgary, Alta. H. Marie Wormington of the Denver Museum of Natural History and William T. Mulloy of the University of Wyoming, Laramie, following an extensive survey of data covering the long period from early hunter to historic, excavated representative sites near Edmonton, Alta., and the Peace river.

Most of the 1956 salvage archaeology in the Missouri river basin project was centred in the Oahe reservoir area covering about 250 mi. between Bismarck, N.D., and Pierre, S.D. Parties from the State Historical Society of North Dakota, Bismarck, the U.S. national park service, the W. H. Over museum of the University of South Dakota, Vermillion, the River Basin Surveys unit of the U.S. Bureau of American Ethnology and the U.S. National museum laboured to save as much as possible of the great quantity of prehistoric and historic material expected to be covered by rising reservoir waters.

Eastern North America.—During the 1954-56 field seasons, the Illinois State museum, Springfield, explored an archaeological site in Randolph county, Ill. A crew of 15 college students supervised by Melvin Fowler and Richard Keslin excavated to a depth of 25 ft. in the Modoc rock shelter, formed by an overhang of the sandstone bluff comprising the eastern edge of the Mississippi flood plain. Five zones, recognized on the basis of soil content, represented the changing ecology of the area over approximately 10,000 years. The major assemblages, occurring in zones 2 through 4, were without pottery, and the artifacts, mostly of stone, threw light upon the food-collecting activities of Archaic culture groups, between about 6000-3000 B.C., according to carbon ¹⁴ samples. Prior to this discovery, the earliest Archaic cultures in the United States had been dated by similar means at around 3500 B.C.

During the summer of 1956, the New York State Museum and Science Service continued its excavations on Long Island, N.Y., on several prehistoric sites threatened with destruction by building expansion. A crew of six college students, directed by William A. Ritchie, explored two stratified shell midden settlement sites at Stony Brook and Wading river which together proved to span a long segment of the Archaic period. The upper stratum at Stony Brook constituted the first recorded major habitation site of the orient culture people, one of whose cemetery sites near Shinnecock, L.I., was also investigated by the group, which uncovered a burial pit with mortuary offerings of stone pots and hunting gear. A radiocarbon date for another burial site of this culture on Long Island showed that the orient culture flourished about 944 B.C.

As the result of 15 months of digging at Jamestown Island, Va., the principal habitation area of the first permanent English

settlement in America was uncovered by the U.S. national park service. More than 150 features were disclosed, among them establishments for ironmaking and working, pottery manufacture, brickmaking and gunsmithing; drainage and property line ditches; the earliest known ice-storage pit in the new world; and the settlement's first cemetery. Data and specimens obtained were expected to contribute greatly to the accuracy of the restorations of "James City" in the 1600s, scheduled to be opened in 1957.

Middle and South America.—The search for Mexican sources of various traits of prehistoric southwestern United States cultures received stimulation through the 1955-56 investigations of J. Charles Kelley at the Schroeder site in Durango, conducted by the Museum of Southern Illinois university, Carbondale. Of two distinct phases of occupation uncovered, the earlier Ayala phase, with simple block masonry, small house platforms and courts grouped around a plaza, was linked with the Colonial period of Hohokam culture in southern Arizona, while the Rio Tunul phase showed connections with the Sedentary stage of Hohokam.

The University of Pennsylvania, Philadelphia, with the co-operation of the Guatemalan government, began a major, long-term project of excavation and restoration at the immense, Classic period, Mayan city of Tikal on the Yucatan peninsula, Mexico. A training and research centre under the direction of John Dimick, with Linton Satterthwaite, Jr., as chief archaeologist, was created in Tikal for the study of Mayan civilization.

(See also ANTHROPOLOGY; NATIONAL GEOGRAPHIC SOCIETY.)
(W. A. RE.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Ancient Baalbek and Palmyra* (1953); *Ancient Petra* (1953); *Carbon Fourteen* (1953); *Land of the Incas* (1955); *Pompeii and Vesuvius* (1951).

Archery. The 72nd annual National Archery association tournament was held at Ocean County park, Lakewood, N.J., Aug. 12-17, 1956, with 300 archers participating. The championship scores of the winners in all divisions were as shown in the table.

Target Archery

Men's championship		Joe Fries, Los Angeles, Calif.
Scores:	Double York round	1,813
	Double American round	1,498 3,311
Ladies' championship		Carole Meinhart, Pittsburgh, Pa.
Scores:	Double National round	1,048
	Double Columbia round	1,202
	Double American round	1,432 3,682
Men's American round division (free style)		W. G. Pierce, Hastings, Mich.
Scores:	Sextuple American round	4,056
	(Bare Bow)	
	Sextuple American round	4,022
Intermediate boys' championship		David Peterson, Long Beach, Calif.
Scores:	Double Hereford round	1,978
	Double American round	1,454 3,432
Intermediate girls' championship		Lynne Smathers, Brevard, N.C.
Scores:	Double National round	829
	Double Columbia round	1,031
	Double American round	1,252 3,112
Junior boys' championship		Kenny Smathers, Brevard, N.C.
Scores:	Quadruple Jr. American round	2,816
Junior girls' championship		Kay Ellen Volkman, Dayton, O.
Scores:	Double Jr. Columbia round	1,109
	Double Jr. American round	1,456 2,565
Beginner boys' championship		David Oelkerking, Bronxville, N.J.
Scores:	Quadruple Jr. Columbia round	1,929
Beginner girls' championship		Loy Elaine Volkman, Dayton, O.
Scores:	Quadruple Jr. Columbia round	2,220

Crossbow

Men's championship		Paul Eytel, Pluckemin, N.J.
Scores:	Quadruple American round	2,600
Ladies' championship		Lillian Eytel, Pluckemin, N.J.
Scores:	Quadruple American round	2,316

Flight Shoot

Men		Charles A. Pierson, Cincinnati, O.
50-lb. class:	483 yd. 1 ft.	Charles A. Pierson
65-lb. class:	498 yd.	Charles A. Pierson
80-lb. class:	515 yd. 1 ft.	Charles A. Pierson
Unlimited class:	485 yd. 2 ft.	Charles A. Pierson
Free style (footbow)	686 yd. 2 ft.	Charles A. Pierson
Women		Margaret Breneman, Columbus, O.
35-lb. class:	366 yd. 2 ft.	Barbara Van Popering, Old Greenwich, Conn.
50-lb. class:	440 yd. 1 ft.	Barbara Van Popering
Unlimited class:		449 yd. 2 ft.
Intermediate boys		Larry Briggs, Jr., Amherst, Mass.
35-lb. class:	179 yd. 2 ft.	Roy Van Tassel, Brooklyn, N.Y.
50-lb. class:	391 yd. 2 ft.	Roy Van Tassel
Unlimited class:	292 yd.	

Flight Shoot—continued

Intermediate girls		No entries
Junior boys		
35-lb. class:	329 yd.	Jim Dillon, Parma, O.
50-lb. class:	405 yd. 2 ft.	Jim Dillon
Unlimited class:	359 yd. 2 ft.	Jim Dillon
Junior girls		No entries
Beginner boys		No entries
Beginner girls		No entries
Crossbow, men		
50-lb. class:	402 yd.	Col. Francis E. Pierce, Coronado, Calif.
65-lb. class:	394 yd. 2 ft.	Col. Francis E. Pierce
80-lb. class:	406 yd. 1 ft.	Col. Francis E. Pierce
Unlimited class:	456 yd. 1 ft.	Col. Francis E. Pierce
Crossbow, women		
35-lb. class:	278 yd. 1 ft.	Fannie Brumble, Cincinnati, O.
50-lb. class:	336 yd.	Fannie Brumble

Clout Shoot

Men	(36 arrows at 180 yd.)	Robert Rhode, Lamont, Ill.	36-302
Ladies	(36 arrows at 140 yd.)	Eleanor Moczadlo, Cleveland, O.	34-284
	(36 arrows at 120 yd.)	Julia Ann Heagey, Lancaster, Pa.	36-290
Intermediate boys	(36 arrows at 120 yd.)	David Peterson, Long Beach, Calif.	36-290
Intermediate girls	(36 arrows at 120 yd.)	Lynne Smathers, Brevard, N.C.	36-294
Junior boys		James Horwitz, Belmont, Mass.	34-238
Junior girls		Janet Leder, Cincinnati, O.	36-272
Beginner boys		David Oelerking, Bronxville, N.J.	27-143
Beginner girls		Loy Elaine Volkman, Dayton, O.	34-200
Senior men—crossbow		Col. Francis E. Pierce, Coronado, Calif.	35-307
Senior women—crossbow		Fannie Brumble, Cincinnati, O.	35-269

The Cleveland Archery club of Cleveland, O., again dominated the team event as it did at the 1955 national tournament at Oxford, O. With a team of four men a new national record in the men's team event (96 arrows at 60 yd.) was established of 384 hits for a total of 2,856 points.

Joe Fries, men's national champion in 1955 and 1956, established a new individual team record of 96-794.

The women's team round (96 arrows at 50 yd.) was won by the Lancaster Archers, whose team of four women scored a total of 379 hits for a total of 2,531 points. (J. R. K.)

Architecture. The building boom of 1955 carried over into 1956 in the United States, new construction of all types reaching a rate of \$44,000,000,000 a year in June. While residential construction for the first six months was 10% below the 1955 peak, new industrial and commercial buildings made up the loss in dollar volume; industrial construction was running 27% above 1955 and commercial building, mainly office buildings, stores, shopping centres and banks, was up 20%. Part of the difficulty in home construction was the result of tighter credit conditions, but congress increased by \$3,000,000,000 the allowable amount of home mortgage insurance. Despite rising material prices, home buyers of 1956 preferred larger houses with larger rooms, more bedrooms and baths and separate dining rooms. Builders predicted that 1956 would produce 28% fewer houses priced below \$15,000 and 61% more homes priced above \$15,000. In July congress authorized the construction of 70,000 public housing units during the next biennium.

According to estimates of current projects in architects' offices, 12 regional directors of the American Institute of Architects reported that architectural activity had increased as much as 15% to 20% over 1955 in five regions and up to 15% in the seven remaining regions. In all but two the principal activity was in school buildings, closely followed by commercial work. Commercial construction had overtaken schools in Texas while in the western mountain areas public building was in first place.

The 88th annual convention of the American Institute of Architects was held in Los Angeles, Calif., May 15-18, 1956. Leon Chatelain, Jr., of Washington, D.C., was elected president for the coming year; John Noble Richards of Toledo, O., was chosen as first vice-president; Philip Will, Jr., of Chicago, Ill., second vice-president; Edward L. Wilson of Ft. Worth, Tex., secretary; and Raymond S. Kastendieck of Gary, Ind., treasurer. Thirty-five members of the institute were advanced to the rank of fellow. The gold medal, highest professional honour given by the institute, was awarded to Clarence Stein of New York city, internationally recognized for pioneering work in civic design.

Design.—Five buildings were selected for first honour awards in the institute's eighth annual competition for outstanding American architecture: Hillsdale high school, San Mateo, Calif., John Lyon Reid and Partners, San Francisco, architects; Center for Advanced Study in Behavioral Sciences, Stanford university, Palo Alto, Calif., Wurster, Bernardi and Emmons, San Francisco, architects; Lambert-St. Louis Municipal Airport terminal, St. Louis, Mo., Hellmuth, Yamasaki and Leinweber, St. Louis and Detroit, architects; Manufacturers Trust Company building on Fifth avenue, New York city, Skidmore, Owings and Merrill, architects; and the Hodgson house, New Canaan, Conn., Philip C. Johnson, New York, architect. Fourteen buildings including residences, commercial buildings, hotels, churches, a medical centre and a police facilities building were selected by the jury for awards of merit.

Among the nation's much-discussed buildings was the Price tower in Bartlesville, Okla., by Frank Lloyd Wright, completed early in 1956. The tower is described as a "single immense cruciform reinforced-concrete column"; each floor is a cantilever slab and the outer envelope a pattern of bands of concrete and copper-sheathed spandrels. The recently consecrated Church of Jesus Christ of Latter Day Saints, Los Angeles, Calif., Edward O. Anderson, architect, which is a golden-tan modernist temple in a vein now popular with the Mormons, also attracted attention. An estimated \$850,000,000 was spent on new churches throughout the country. Winners of 1956 architectural awards at the annual National Joint Conference on Church Architecture were: Richard J. Neutra, architect for the Navy chapel at Miramar, Calif.; Harold Wagoner for the Presbyterian church, Vero Beach, Fla.; Alfred Pries for the First Methodist church, Honolulu, Haw.; and Frederick Hodgson for the First Evangelical United Brethren church in Santa Ana, Calif.

In Hollywood, Calif., Capitol Records erected a 13-story edifice, the world's first circular office building, and early in the year the circular steel-and-glass St. Patrick's high school was opened at Kankakee, Ill. These circular structures recall the projected art museum designed by Frank Lloyd Wright for the Solomon R. Guggenheim foundation of New York city.

Two research laboratories, one for General Motors at Warren, Mich., another for the United States Steel corporation at Monroeville, Pa., opened in May. The campus-style buildings at Warren are grouped around a 22-ac. lake and dominated by a 132-ft. stainless steel water tower. The buildings have window walls, and extensive use is made of glazed brick in a variety of colours. New York city's \$35,000,000 Coliseum, the world's largest exhibition hall, including a 20-story office building and basement parking for 850 cars, opened late in April.

Forty-nine Chicago area architects, builders, craftsmen and artists received recognition for superior design and construction on June 7 at the city's second annual Civic Pride luncheon. Honour awards went to the Prudential building, Naess and Murphy, architects; the American National Bank and Trust Co., Skidmore, Owings and Merrill, architects; the Hubbard Woods fashion centre, Cone and Dornbusch, architects; the city parking facility at 120 N. La Salle St., Friedman, Alschuler and Sincere, architects; the Highland Park high school, Loehl, Schlossman and Bennett, architects; and the Elliott chapel of the Presbyterian home in Evanston, Schmidt, Garden and Martin, architects. Citations of merit were awarded to a number of recent structures, among them the attractive St. Andrew's Lutheran church in suburban Park Ridge, Edward Stadel and Associates, architects; and the St. Paul Federal Savings and Loan association, Holabird and Root and Burgee, architects.

New Materials and Methods.—Manufacturers strove to perfect curtain wall panels of lightweight concrete, glass, aluminum, stainless and porcelain-enamelled steel, bronze, stone, terra cotta

and plastics, permitting lighter frames, more rapid construction and new aesthetic effects. These were well illustrated in the 19-story Inland Steel building in Chicago, sheathed with stainless steel, and the Signode Steel Strapping company's new plant in suburban Glenview, clad with five-inch lightweight concrete panels which permitted the 80,000 sq.ft. of walls to be enclosed in six days.

Structures that attracted attention because of new or unique shapes or methods were the steel sphere designed to house the atomic power plant at West Milton, N.Y., and the proposed Pittsburgh Civic auditorium, 415 ft. in diameter, capped with a retractable dome which opens up to reveal an open-air arena seating up to 14,000 people. The Lambert-St. Louis Municipal Air terminal attracted attention because its roof was in the form of three great groin vaults of thin-shell concrete covering an area 415 ft. by 120 ft. uninterrupted by columns. Similarly, the Edsel Ford high school at Dearborn, Mich., was Michigan's first building roofed with thin-shelled concrete vaults. The domed auditorium of General Motors' Technical centre, with a luminous 88-ft. ceiling, provided shadowless lighting, and the new Cherry Hill laboratories of the Radio Corporation of America near Camden, N.J., and the building of the Lutheran Brotherhood in Minneapolis, Minn., encased in colourful porcelain-enamelled steel wall panels, wrote new notes in architectural polychromy.

Other Countries.—In west Berlin, Ger., three structures were under construction, financed in part by United States aid: a \$6,000,000 hotel, a congress hall and a huge garment centre housing 35 to 40 clothing firms. The congress hall, intended for cultural meetings and conventions, was to be the United States' official entry in Berlin's 1957 International Building exposition. The city of Cologne, Ger., held a competition for the redesign of the area surrounding Cologne cathedral, while at Stuttgart, Ger., Fritz Leonhard designed and erected a reinforced-concrete television tower 692 ft. high with two elevators to the observation tower and two aerial restaurants, cantilevered from the shaft. This structure recalls the handsome Microwave tower at Nutley, N.J., Rossetti, Giffels and Vallet, architects. Monaco rushed to completion a new residential and civic centre dominated by a 14-story luxury apartment house, a four-story block of studio apartments and a six-story administration building; only the jail remained to be completed.

In India, the government had under construction a new capital city at Chandigarh. Working with the renowned French architects Le Corbusier and his cousin Pierre Jeanneret were British and Indian architects. Le Corbusier's Supreme Court building of reinforced concrete employed brick walls, and, to meet climatic conditions, a structural "umbrella" was raised above the roof. Oscar Niemeyer, noted Brazilian architect, designed a modern art museum for Caracas, Venez., in the form of an inverted truncated pyramid with the main gallery at the top, lighted with a system of louvers. Jean Maunoury of France, architect of Chartres cathedral; Gustavo Wallis, past president of the Ninth Pan-American Congress of Architects; Ernesto N. Rogers, Italian architect; and Edmundo G. Lucero, president of the Philippine Institute of Architects, were awarded honorary membership in the American Institute of Architects for distinguished service to architecture. A multistory group of family apartments, each with an outside balcony, was completed during 1956 in Toronto, Ont., Page and Steele, architects. (See also MUSEUMS.) (R. NB.)

ENCYCLOPEDIA BRITANNICA FILMS.—*Building America's Houses* (1947); *The Living City* (1953).

FRANK LLOYD WRIGHT (left) exhibiting his design for a mile-high skyscraper at a press conference in Chicago, Ill., Oct. 16, 1956. The 528-story building would be equipped with atomic-powered elevators to carry the 130,000 tenants



Areas and Populations of the Countries

of the World. The political entities of the world are listed here with their areas, populations and number of persons per square mile. The latest census or latest estimate is given for each country. Areas in square miles are in accordance with the boundaries for the year of the population figure unless otherwise noted. Some of the later boundary adjustments had not been recognized at the end of 1956 by the U.S. government. The subtotals for colonial groupings within continents do not carry density figures. The table provides a fundamental basis for country comparisons.

Areas and Populations of the Countries of the World

(For statistical details and dates see separate articles)

Name of continent and state	Area (in sq.mi.)	Population (in thousands)	Persons per sq.mi.
World total	58,332,990	2,684,660	51.3*
AFRICA	11,683,824	217,909	18.7
Belgian colony and trusteeship	925,733	16,675	
British colonies, dependencies, protectorates, trusteeships and condominium	2,030,057	69,503	
Egypt	386,100	22,934	59.4
Ethiopia (incl. Eritrea)	457,142	16,000	35.0
French colonies, trusteeships, protectorates, departments and overseas territories	4,074,802	41,176	
Italian Somaliland	198,275	1,269	6.4
Liberia	43,000	1,250	29.1
Libya	679,358	1,092	1.6
Morocco	174,471	9,669	55.4
Portuguese colonies	794,959	11,124	
South-West Africa (mandate of Union of South Africa)	317,725	458	1.4
Spanish colonies	113,534	348	
Sudan	967,500	8,960	9.3
Tunisia	48,332	3,782	78.3
Union of South Africa	472,733	13,669	28.9
Union of South Africa dependencies	103	Uninhabited	
ANTARCTICA	6,000,000	Uninhabited	
ASIA (exclusive of U.S.S.R.)	10,598,810	1,474,638	139.1
Afghanistan	251,000	13,000	51.8
Bahrain	231	120	519.5
Bhutan	19,305	623	32.3
British colonies, dependencies, protectorates, protected state and independent state under British protection	245,848	12,376	
Burma	261,757	19,434	74.2
Cambodia	67,568	4,358	64.5
Ceylon	25,332	8,099	319.7
China (including Formosa, Manchuria and Tibet)	3,911,209	601,938	153.9
India, Republic of (including Jammu and Kashmir)	1,265,763	381,690	301.5
Indonesia	575,893	81,900	142.2
Iran	636,293	21,146	33.2
Iraq	171,599	5,200	30.3
Israel	7,984	1,827	228.8
Japan	142,801	90,017	630.4
Jordan	37,264	1,471	39.5
Korea	85,266	28,600	335.4
Kuwait	8,000	200	25.0
Laos	91,506	1,425	15.6
Lebanon	4,015	1,425	354.9
Mongolian People's Republic	591,119	1,000	1.7
Nepal	54,510	8,432	154.7
Netherlands New Guinea	160,618	700	4.4
Oman and Muscat	82,000	550	6.7
Pakistan, Republic of	364,737	80,167	219.8
Philippines, Republic of the	115,707	22,265	192.4
Portuguese colonies	8,876	1,322	
Qatar	8,500	35	4.1
Saudi Arabia	617,760	7,000	11.3
Sikkim	2,744	136	49.5
Syria	71,227	3,906	54.8
Thailand (Siam)	198,270	20,686	104.3
Trucial Sheiks	5,792	80	13.8
Turkey	303,052	24,112	79.6
United States possessions (military governments)	888	798	
Vietnam (North)	63,360	12,500	197.3
Vietnam (South)	65,726	11,500	175.0
Yemen	75,290	4,500	59.8
AUSTRALIA AND OCEANIA	3,304,954	15,435	4.7
Australia	2,974,581	8,987	3.0
Australian dependency, territory and trusteeship	183,775	1,706	
British colonies, dependencies, condominium, protectorate and protected state	24,924	595	
French colonies	9,198	128	
New Zealand	103,740	2,172	20.9
New Zealand dependencies and trusteeship	1,324	117	
United States possessions, territory, condominiums and trusteeship	7,412	1,730	
EUROPE (exclusive of U.S.S.R.)	1,902,878	409,295	215.1
Albania	11,100	1,394	125.6
Andorra	175	6	34.3
Austria	32,374	6,974	215.4
Belgium	11,779	8,868	752.9
British colonies	124	339	
Bulgaria	42,796	7,548	176.4

Areas and Populations of the Countries of the World—Continued

Name of continent and state	Area (in sq.mi.)	Population (in thousands)	Persons per sq.mi.
Czechoslovakia	49,354	13,089	265.2
Denmark (excl. Greenland, incl. Faeroe Islands)	17,117	4,422	258.3
Finland	130,119	4,276	32.9
France	212,736	43,600	204.9
Saar	991	916	100.5
German Democratic Republic (East)	41,380	16,500	398.7
German Federal Republic (West)	94,905	49,995	526.8
Berlin	341	3,300	9,677.4
Greece	51,182	7,973	155.8
Hungary	35,905	9,861	274.6
Iceland	39,768	160	4.0
Ireland, Republic of	27,136	2,895	106.5
Italy	116,294	48,951	420.9
Liechtenstein	61	15	245.9
Luxembourg	999	309	309.3
Monaco	0.6	20	33,333.3
Netherlands	12,524	10,852	866.5
Norway (including Spitzbergen)	149,284	3,441	23.1
Poland	120,442	27,680	229.8
Portugal	35,529	8,843	248.9
Rumania	91,654	17,490	190.8
San Marino	38	14	368.4
Spain	194,945	28,203	144.7
Sweden	173,546	7,290	42.0
Switzerland	15,941	5,001	313.7
United Kingdom	93,895	51,136	544.6
Vatican City	0.2	1	5,000.0
Yugoslavia	98,766	17,853	180.8
U.S.S.R. (1946 area, 1956 pop. est.)	8,598,678	200,200	23.3
NORTH AMERICA	9,354,832	240,826	25.7
British colonies and dependencies	21,389	3,122	
Canada	3,845,774	15,601	4.1
Costa Rica	19,695	970	49.3
Cuba	44,217	5,829	131.8
Greenland, including ice cap	840,000	26	0.03
Dominican Republic	18,682	2,463	131.8
El Salvador	8,260	2,231	270.1
French territory and departments	1,205	473	
Guatemala	42,042	3,325	79.1
Haiti	10,748	3,305	307.5
Honduras	43,277	1,660	38.4
Mexico	760,373	29,679	39.0
Netherlands Antilles	366	187	510.9
Nicaragua	57,143	1,261	22.1
Panamá (excluding Canal Zone)	28,753	934	32.5
United States	3,022,387	167,191	55.3
United States possessions	590,521	2,569	
SOUTH AMERICA	6,889,014	126,357	18.3
Argentina	1,084,359	19,108	17.6
Bolivia	424,162	3,198	7.5
Brazil	3,287,195	60,080	18.3
British colonies and dependencies	87,615	487	
Chile	286,396	6,855	23.9
Colombia	439,519	12,939	29.4
Ecuador	105,743	3,675	34.8
French Guiana (French department)	35,135	28	0.8
Paraguay	157,047	1,601	10.2
Peru	506,189	9,396	18.6
Surinam	55,143	240	4.4
Uruguay	68,369	2,801	41.0
Venezuela	352,142	5,949	16.9

*In computing the world density the area of Antarctica is omitted.

Argentina. A republic occupying the southeasternmost section of South America, Argentina is bounded on the north by Paraguay, Bolivia and Brazil; on the south and west by Chile; and on the east by Uruguay, the Río de la Plata and the Atlantic ocean. It is the second largest Latin American nation—only Brazil is larger—with an area of 1,084,359 sq.mi. and a population of 19,108,000 (est. 1955), mostly of European ancestry. The capital and leading port, Buenos Aires, had by the 1947 census 2,981,043 (1952 est. 3,403,600). Other leading cities with 1950 populations, are: Rosario, 467,937; Córdoba, 369,886; Avellaneda, 278,621; La Plata, 207,031; Lanús 244,473; Tucumán, 194,166; Santa Fé, 168,791; Lomas de Zamora, 125,943; Quilmes, 115,113; Mar del Plata, 114,729; Mendoza, 97,496; and Bahía Blanca, 112,597. Religion: Christian, mostly Roman Catholic. President in 1956: Gen. Pedro Eugenio Aramburu.

History.—During 1956 the provisional government of Argentina was plagued by subversive activity frequently accompanied by violence. President Aramburu adopted a hard anti-Peronist policy. On June 9, a bloody 12-hr. revolt erupted in La Pampa, Santa Fé and Buenos Aires provinces, which was variously blamed on civilian supporters of the Gen. Juan D. Perón regime, discontented army elements and the Communists. The government declared martial law, and government forces quickly

brought all affected areas under control.

The government arrested 2,500 civilian and military personnel, netting two-thirds of the guiding triumvirate, and executed 38. Gen. Juan José Valle, a Perón favourite, was executed. Raúl Lagomarsino, millionaire hatmaker, was sentenced to death but spared when Aramburu revoked martial law on June 13 and commuted pending death sentences to life imprisonment. Raúl Tanco, another Peronista ex-general, found asylum in the Haitian embassy and later went into exile in Venezuela.

Argentine politics appeared to have regained its pre-Perón vigour. The greatest stimulus to action was Aramburu's July announcement that elections would be held in the last quarter of 1957. The Partido Demócrata (Conservative) and the Radical party seemed to be aiming at the discontented and dispossessed adherents of Perón when both criticized Aramburu's harsh anti-Peronista policies and demanded a general amnesty. Political arguments also centred on Aramburu's vague plans to decree a statute governing the internal organization of political parties, and to have a constitutional assembly either before or after the elections. Decrees prohibiting military men or functionaries of the provisional government from running for office were criticized only by the right-wing ultranationalists.

At the end of April Aramburu decreed the restoration of the 1853 constitution. In June the provisional government reduced the number of cabinet ministries from 17 to 13 by fusing the functions of finance with treasury, commerce with industry, education with justice, and communications with transport. There was general agreement that the new cabinet was the most cohesive since the revolution.

In a final report published in January, economist Raúl Prebisch advised the government to strive for increased production, establishment of incentives to private enterprise, a multilateral foreign trade policy, and foreign loans and investment capital. The government successfully carried out the two latter recommendations.

Trade agreements allowing for convertibility of currency were negotiated with several European countries. An economic mission to the United States succeeded in getting immediate Export-Import Bank of Washington, D.C., loans exceeding \$100,000,000 to rehabilitate the run-down transport system, and private foreign investment took a noticeable upswing.

In the reorientation of the domestic economy, labour presented the most serious problem. Neither labour nor employers appeared willing to accept the implied austerity of Prebisch's recommendations. Negotiations to renew labour contracts dragged through the year. A general 10% wage increase was granted in February to ease the adjustment resulting from devaluation after the 1955 revolution, but serious attempts to renegotiate contracts were not begun until July. Government control had been assured when the Confederación General del Trabajo was broken up after Perón's downfall with all unions being placed under the supervision of "interventors." Constant union demands for freedom from restraints, however, led to several serious strike threats. In mid-year, unions were allowed to select bargaining representatives, and talks were begun. Employer reluctance to meet heavy wage demands placed most cases in the hands of the labour ministry, which under existing regulations had to arbitrate in the event of deadlocks. Finding no solution to the problem of whether to grant wage scales unacceptable to employers or to face serious labour troubles if substantial raises were not granted, Labour Minister Raúl Migone resigned in September, leaving his successor, Horacio Aguirre Lagarreta, with a potentially explosive situation.

The daily *La Prensa*, confiscated by Perón in 1951, heralded the return of freedom of the press on Feb. 3 by appearing once again under the guiding hand of publisher Alberto Gainza Paz. Other papers, however, displayed something less than enthusiasm,

since *La Prensa's* newsprint quota was twice that of any other daily. Government reluctance to reduce restrictions on the importation of newsprint was a source of irritation, but plans for 1957 called for relatively free import policies as well as a substantial increase in domestic newsprint production.

(See also ANTARCTICA; FOREIGN INVESTMENTS.) (R. H.N.)

Education.—On June 30, 1951, there were 15,874 primary schools with 2,446,138 pupils and 101,646 teachers; 2,069 public secondary, normal and special schools with 360,917 students and 46,204 teachers; 32 autonomous schools with 2,544 students and 206 teachers; and 1,132 private schools with 153,926 students and 4,993 teachers. There were national universities at Buenos Aires (41,325 students), La Plata (7,409), Córdoba (9,335), Cuyo (2,596), Tucumán (3,191) and the National University of the Litoral at Santa Fé (16,325). University professors numbered 3,621.

Finance.—The monetary unit is the peso, valued during 1956 at 5.56 cents U.S. currency, official rate, and at a free market rate ranging during the first 11 months of 1956 from a high of 3.6 cents (Aug. 7) and a low of 2.38 cents (Feb. 20). The 1956 budget (preliminary) projected total expenditures at 35,029,000,000 pesos, including 26,198,000,000 pesos for the national administration, 3,077,000,000 pesos for autonomous institutions and 3,754,000,000 pesos for special accounts. Cash receipts were estimated at 26,667,000,000 pesos; the deficit of 8,362,000,000 pesos was to be financed by bond issues. The national debt (all internal) was 41,684,000,000 pesos on Dec. 31, 1954; the figures did not include the debt of official agencies and of provincial and municipal governments. Currency in circulation (Feb. 29, 1956) was 30,400,000,000 pesos; demand deposits, 22,900,000,000 pesos. The U.S. department of commerce estimated U.S. direct private investments in 1955 at \$446,000,000, of which \$230,000,000 represented investments in manufacturing. The cost-of-living index (Buenos Aires) stood at 135 in Aug. 1956 (1953 = 100).

Trade and Communications.—Exports in 1955 were officially valued at 7,297,645,000 pesos (U.S. \$928,119,000) and imports at 8,904,620,000 pesos (U.S. \$1,175,571,000). Leading exports were meat (28%), cereals and linseed (23%), wool (14%), hides (6%) and dairy products (5%); leading imports, machinery and vehicles (23%), iron and steel and manufactures (16%), timber and products (11%), fuels and lubricants (11%) and chemicals and drugs (8%). Leading customers were the U.K. (24%), the U.S. (18%), Brazil (12%), Italy (5%) and Germany (5%); leading suppliers, the U.S. (15%), Brazil (9%), the U.K. (7%), Germany (7%) and Japan (7%).

Railways (1949) totalled 26,893 mi. In 1952 there were 248,400 mi. of road, of which 41,000 mi. were national and provincial highways. Registered motor vehicles (Jan. 1, 1955) included 314,185 automobiles, 148,505 trucks and 14,903 buses. Telephones (Jan. 1, 1955) numbered 1,080,272, of which 81.9% were automatic and 56% were located in Buenos Aires. According to *Lloyd's Register of Shipping*, the merchant marine (June 30, 1955) had 364 vessels (100 tons and over) aggregating 1,043,056 gross tons.

Agriculture.—Production figures for the crop year 1955-56 were officially reported as follows (in metric tons): wheat 5,250,000; maize 3,870,000; barley 951,000; oats 732,000; rye 653,000; linseed 231,000; cottonseed 220,000; rice 174,000; tobacco 37,530; sunflower seed 732,000. Grain exports in 1955 (metric tons) included wheat 3,581,900; maize 375,000; rye 319,000; oats 97,000; barley 495,000.

The 1952 livestock census showed 45,262,995 cattle, 54,683,731 sheep, 3,989,188 pigs, (census 1947) 7,237,663 horses, 4,933,679 goats. Wool exports in 1955 were reported at about 104,900 metric tons, of which 40,439 tons went to the U.S., 14,578 tons to the U.K. and 10,726 tons to the Netherlands. Meat production (1955) was about 1,437,000 metric tons; exports included 1,159,858 frozen beef quarters, 1,519,787 chilled beef quarters, 370,880 frozen mutton carcasses and 3,094,495 frozen lamb carcasses.

Manufactures.—According to the 1954 industrial census, there were 181,763 manufacturing and mining establishments with 1,536,530 employees. Production figures for 1955 included portland cement 1,848,000 metric tons; cotton yarn 94,400 tons; wheat flour 2,081,000 tons; sulphuric acid 100,000 tons; steel ingots 180,000 tons; rolled steel products 667,000 tons; manufactured gas 337,200,000 cu.m. Installed electric energy capacity at the end of 1955 was 2,069,000 kw.; production in that year (public use only) totalled 5,944,000,000 kw.hr. The index of industrial production stood at 118 in 1955 (1953 = 100).

Minerals.—Petroleum production in 1955 totalled 4,847,448 cu.m. (30,538,000 bbl.), more than 80% of which came from government fields. Production of lead was estimated at 19,800 short tons in 1955; zinc 23,401 tons; coal 146,000 tons. In 1955, 8,372,259 metric tons of fuels and lubricants were imported.

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ENCYCLOPÆDIA BRITANNICA FILMS.—*Argentina* (People of Buenos Aires) (1940).

Arizona. Arizona, the "Grand Canyon state," is located in the southwestern part of the United States, bounded on the west by the Colorado river and Nevada and on the south by Mexico. The area is 113,575 sq.mi. The population (1950 census) was 749,587, when whites numbered 654,511, Negroes 25,974; Indians 65,761, Japanese 760 and Chinese 1,644. The provisional estimate for the July 1, 1956, population of the state, as reported by the U.S. bureau of the census, was 1,057,000. The capital, Phoenix (Sept. 1956 estimate) numbered 170,000, city limit, and 500,000, municipal area. Tucson (1956 estimate) was 95,856

in city limits and 199,545 in municipal area.

The chamber of commerce estimated Yuma as 20,000 in 1956. Mesa (1950) had 16,700; Douglas, 9,942; Flagstaff, 7,663; and Prescott, 6,764.

History.—State officers (1956) were: chief justice, Arthur La Prade; governor, Ernest W. McFarland; secretary of state, Wesley Bolin; treasurer, R. T. Williams, Jr.; attorney general, Robert Morrison; superintendent of instruction, Clifton L. Harkins.

A code commission had been named in 1954 to revise the laws of Arizona passed since Arizona became a state in 1912. On Jan. 7, 1956, there ended a 76-day series of special sessions that had been working since Oct. 24, 1955, on the report of the commission. The code consisted of 5,142 pages, 75 pages of which were amendments adopted by both house and senate after their respective committees had consulted the leading law firms of the state. The reading of approximately 2,000,000 words before each house, two times before the final vote, presented a problem. Since it was almost time for the regular session to begin, the reading had to be done quickly. The senate had 20 persons reading at one time, and the house had 54. Single readers were used for the first reading, which took five days. Governor McFarland stated that the passage of the enormous code was the most important act in the history of the state.

The ground-water question again appeared in a senate bill that provided for applications for permits to construct wells within critical areas. The applicant for a permit should state the location of the well, the ground-water basin, the acre-feet per year to be used and the depth and type of construction.

A measure was passed increasing a number of salaries. The largest salaries to be received were: governor, \$18,000; attorney general, \$12,500; and superintendent of public instruction, \$12,000. Since the governor had asked that his salary not be increased, the secretary of state filed the bill April 3, and the governor permitted it to become a law without his signature. Because of the problem of juvenile delinquency, a bill made parents liable for torts of minors, providing that one or both parents having control or custody of minors would be liable, not to exceed \$500, for the damage done by minors.

In the November elections the Democrats had a majority of registered voters of more than 139,000, but Pres. Dwight D. Eisenhower polled a majority of votes of about 58,000.

The state officials, however, all remained Democrats, and all were re-elected except for a new treasurer, J. W. Kelly, and new superintendent of public instruction, Marion L. Brooks. Republicans won 2 of the 28 seats in the senate and 15 of the 80 seats in the house.

Education.—The enrolment in elementary schools and the number of teachers for 1955-56 were, respectively, 177,310 and 5,915; the corresponding numbers in high schools were 45,782 and 1,892. The appropriations (1956) for the University of Arizona at Tucson and the two state colleges at Tempe and Flagstaff were, respectively, \$4,201,195, \$2,329,717 and \$695,831.

Social Insurance and Assistance, Public Welfare and Related Programs.—The total number of persons receiving state assistance in March 1956 was 30,805. The appropriations for state welfare were: industrial school, \$340,021; state hospital, \$2,282,905; crippled children, \$341,020; dependent children, \$2,149,700; pioneer home, \$166,313; prison, \$1,269,520; school for the deaf and blind, \$500,920; tuberculosis sanitarium, \$299,597; old-age assistance, \$3,609,000.

Communications.—The Arizona highway department reported in Sept. 1956 road mileage as follows: primary state highways, 4,225; county roads, 16,497; federal-aid highways, 2,349; and national roads, 8,236. The Arizona corporation commission reported that as of Dec. 1955 there were 3,422 mi. of railroads, and that there were four commercial air lines in the state. Phoenix had (1956) ten radio and four television stations; Tucson had six and three.

Banking and Finance.—The superintendent of banks reported for June 30, 1956, that national banks in Arizona had deposits of \$570,512,875; loans and discounts, \$307,726,505; government securities, \$129,342,202. State banks had deposits of \$210,452,126; loans and discounts, \$90,072,474; government securities, \$82,392,350; each item but the last in both instances was in excess of the amount for the same month of the previous year. State and local taxes for the fiscal year 1955-56 were \$152,268,303, and the federal taxes were \$184,565,000.

The state indebtedness at the beginning of the fiscal year, July 1, 1955, was \$7,215,275.29, and there was an available balance of \$32,493,333.15. The state expenditures for the fiscal year beginning July 1, 1956, were listed at \$98,387,224.

Agriculture.—Arizona received during the first eight months of 1956 only 57% of average rainfall, according to the U.S. weather bureau sta-

Table I.—Principal Crops of Arizona

Crop	Indicated 1956	1955	Average, 1945-54
Barley, bu.	10,380,000	11,280,000	6,461,000
Wheat, bu.	1,682,000	1,218,000	546,000
Oats, bu.	616,000	517,000	468,000
Sorghum grain, bu.	4,950,000	6,783,000	2,498,000
Potatoes, cwt.	1,032,000	1,352,000	994,000
Corn, bu.	1,260,000	1,250,000	436,000
Alfalfa hay, tons.	663,000	669,000	562,000
Alfalfa seed, lb.	6,100,000	4,480,000	7,300,000
Cotton, bales	840,000	728,000	559,000
Grapefruit, boxes	3,000,000	2,370,000	2,991,000
Oranges, boxes	1,320,000	1,150,000	1,022,000

Source: U.S. Department of Agriculture.

tioned at Phoenix. This not only reduced the returns of cattle raisers, but through the first eight months caused 1,303 forest and brush fires, further reducing pasturage. The dry weather resulted in early cotton picking, making a demand by Sept. 21 for 8,900 cotton hand pickers in addition to the many machine pickers in the state. Because of cotton acreage controls, farmers planted more wheat, some of which was used for pasture and hay. These crops were produced by irrigation.

Manufacturing.—Stanley Womer of the Arizona development board commented on the rapid development of industries in Arizona. The number employed in June 1954 was 26,100; June 1955, 31,900; and June 1956, 35,900. There were 450 plants in Phoenix. Hughes Aircraft of Tucson employed the largest number of any institution in the state. A new cement plant was being built at Clarksdale, a paper mill was planned for the Verde valley, and a uranium-processing mill was being built at Tuba City on the Navajo reservation. Old Fort Huachuca, used for military electronics, had grown into a real city. (H. A. H.)

Mineral Production.—Including only those items whose value was \$100,000 or more, Table II shows the tonnage and value of minerals produced in Arizona in 1954, compared with 1953. In 1954 Arizona was first among the states in recoverable copper output and in chromite, second in asbestos, third in bentonite and molybdenum, fourth in columbium-tantalite,

Table II.—Mineral Production of Arizona

Mineral	(In short tons, except as noted)		1954	
	Quantity	Value	Quantity	Value
Total		\$256,616,000		\$253,078,000*
Clays	197,000	715,000	254,000	814,000
Copper	394,000	225,883,000	378,000	222,977,000
Gold (oz.)	113,000	3,949,000	115,000	4,018,000
Lead	9,000	2,470,000	8,000	2,297,000
Lime	96,000	1,238,000	89,000	1,237,000
Molybdenum	1,000	1,426,000	?	?
Pumice	124,000	426,000	81,000	126,000
Sand and gravel	3,447,000	2,680,000	3,764,000	3,067,000
Silver (oz.)	4,351,000	3,938,000	4,299,000	3,891,000
Stone	442,000	619,000	1,205,000	1,914,000
Tungsten concentrate (60% WO ₃ basis)	134	469,000	132	457,000
Zinc	28,000	6,332,000	21,000	4,636,000
Other minerals . . . . .	...	6,471,000	...	8,432,000

*Total has been adjusted to eliminate duplication in the value of clays and stone.

†Value included with other minerals.

Source: U.S. Bureau of Mines.

silver (since 1943), and pumice, and fifth in diatomite (Arizona listed as a producer for first time), fluorspar, and in gold output. Arizona, 17th in rank, produced 1.81% of the U.S. total value of minerals.

ENCYCLOPEDIA BRITANNICA FILMS.—Arizona (1955); *The Southwestern States* (1954).

Arkansas. Arkansas, a south central state of the United States, often called the "Land of Opportunity," was admitted to the union in 1836. Its area is 53,104 sq.mi., including 429 sq.mi. of water. Pop. (1950 census) 1,909,511; (July 1, 1956, provisional est.) 1,815,000. The 1950 census placed 67% of the population in rural areas, compared with 77.8% in 1940. Indicating a population movement to the cities, the estimate of rural population amounted to only 60% in 1955. The population was listed as 77% native white, 0.5% foreign born and 22.3% Negro.

Little Rock, the capital city, had 102,213 inhabitants in 1950; other large cities were Fort Smith, 47,942; North Little Rock, 44,097; Pine Bluff, 37,162; Hot Springs, 29,307; El Dorado, 23,076; Fayetteville, 17,071.

History.—Gov. Orval E. Faubus was re-elected to a second two-year term to begin Jan. 1957. During 1955 and 1956, sweeping changes, administratively and legislatively, were made in the

state government. The general assembly reorganized the state's fiscal organization, but it left the legislature with broad post-auditing powers.

Two of the most significant additions to the governmental organization were the creation of the Arkansas Industrial Development commission and the Arkansas Publicity and Parks commission. Winthrop Rockefeller, who established his home in Arkansas in 1952, was appointed head of the development commission by Governor Faubus. John C. Sheffield, Helena, was appointed chairman of the Arkansas publicity and parks commission.

During 1956, two state parks were planned in addition to the eleven existing parks in the state, and a \$3,000,000 expansion and improvement program in the state's park system was undertaken.

Constitutional officers during 1956, in addition to Governor Faubus, included Nathan Gordon, lieutenant governor; C. G. (Crip) Hall, secretary of state; Jimmie "Red" Jones, state auditor; J. Vance Clayton, state treasurer; Bruce Bennett, attorney general; Sam Jones, land commissioner.

In the Nov. 1956 general election, the Democratic electors polled 54% of the votes for president, the ratio being 213,000 Democratic ballots to 186,000 Republican. Gov. Orval Faubus, Democrat, running for a second term, was re-elected, as was U.S. Sen. J. William Fulbright, also a Democrat.

Education.—For the school year 1954-55 Arkansas had 1,424 elementary schools with an enrolment of 266,271. Teachers and principals in elementary schools numbered 8,080; in secondary schools, 5,990. Expenditures for the year ending June 30, 1955, totalled, current, \$47,334,059; state sources, \$2,916,919; capital outlay, \$56,859,940. New construction for 1955 was \$7,864,469; bonded debt, \$5,354,561; on nonbonded debt, \$5,354,561; transfers, \$354,954. The grand total spent in Arkansas amounted to \$64,724,409. A. W. Ford was commissioner of education.

Social Insurance and Assistance, Public Welfare and Related Programs.—For the fiscal year ending June 30, 1956, old-age assistance grants in the amount of \$21,841,508 were paid to a monthly average of 54,861 recipients. A monthly average of 2,024 blind persons received a total of \$965,741; an average of 359 general relief cases (temporarily disabled) received \$58,974.03; and an average of 5,209 permanently and totally disabled persons received a total of \$1,966,168. Carl Adams was commissioner of welfare.

Unemployment benefits paid to about 38,000 persons during the fiscal year ending June 30, 1956, totalled \$6,544,019, a decrease of 22% from the previous year. There were 377,134 weeks of unemployment and an average weekly payment of \$17.98. The maximum weekly payment was increased from \$22 to \$26 during the year.

Arkansas maintained one penitentiary and four reformatories at a total expense of \$1,101,923.86 during the fiscal year 1955. The institutions housed an average of 1,518 adult and 305 juvenile inmates.

Communications.—Expenditures by the state government on highways during the fiscal year ending June 30, 1956, totalled \$38,600,000. At the end of that period, the highway system comprised 10,038 mi.; country road system, not in the state system, measured 57,905 mi. All highways and roads in the state (state, federal and local combined) totalled 73,831 mi.; total of 8,027 mi. were surfaced. New road and highway construction completed in the 1955-56 fiscal year aggregated 781.51 mi.; 152 new bridges were built during the year.

Main track railway mileage was 4,600; airway mileage about 1,000. There were 83 established airports. There were 324,272 telephones in use in the state.

Banking and Finance.—Arkansas had 182 state and 54 national banks on June 30, 1956. Deposits in state banks totalled \$460,899,256.50. Deposits in national banks totalled \$17,612,000; assets, national, \$565,999,000; state, \$508,372,879.50. There were 39 federal savings and loan associations and 6 active state building and loan associations.

Total expenditures for the state for the fiscal year ending June 30, 1956, amounted to \$168,945,307.17. Total revenue for the same period both general and special amounted to \$111,999,468.80. There was \$12,641,887.2 surplus from allotted funds, appropriated and federal funds.

Agriculture.—The U.S. department of agriculture estimated the value of crops harvested in Arkansas in 1955 at \$472,463,000, a 14% increase over the previous year. Cotton was the state's most valuable crop in 1955, worth \$302,768,000; rice ranked second with a value of \$56,488,000; crockers, the third money product, amounted to \$52,575,000; soybeans were valued at \$43,812,000.

Cash receipts to farmers from farm commodities sold during 1955 totalled \$547,703,000, a decrease of 4.8% over the previous year. Livestock accounted for \$168,784,000, or 31% of the total cash receipts.

Manufacturing.—The value of output of all manufactured goods for 1955 totalled \$1,082,000,000, an increase of 20.36% over the previous year. Changes in manufacturing for the quarter ending March 31, 1956, totalled \$5,259,758 and were paid to a monthly average of 88,932 employees. During 1955-56, the Arkansas Industrial Development commission reported 73 new industries established and substantial expansion made in 110 existing industries. The greatest new units were listed in food processing, wearing apparel and fabrics plants.

Table I.—Principal Crops of Arkansas

Crop	1956	1955	Average, 1945-54
Corn, bu.	16,900,000	19,558,000	22,488,000
Cotton, bales	1,510,000	1,663,000	1,382,000
Cottonseed, tons	608,530	678,000	558,000
Rice, 100-lb. bags	11,339,000	12,694,000	9,272,000
Oats, bu.	17,120,000	16,560,000	7,088,000
Potatoes, Irish, cwt.	576,000	660,000	788,000
Sweet potatoes, cwt.	273,000	377,000	344,000
Apples, bu.	673,000	35,000	464,000
Peaches, bu.	1,980,000	*	1,766,000
Grapes, tons	10,600	2,900	8,510
Pecans, lb.	6,000,000	7,950,000	4,449,000
Soybeans, for beans, bu.	26,866,000	21,906,000	8,226,000
Wheat, bu.	2,295,000	1,404,000	661,000

*Less than 500 bushels.

Source: U.S. Department of Agriculture.

Table II.—Principal Industries of Arkansas

Industry	All employees 1954	Salaries and wages (in 000s) 1954	Value added by manufacture 1954 (in 000s)	Value added by manufacture 1953 (in 000s)
Apparel and related products	5,250	\$ 9,978	\$14,381	\$ *
Lumber and products (except furniture)	21,723	48,345	71,660	79,012
Furniture and fixtures	4,856	12,435	19,014	18,834
Paper and allied products	3,993	15,975	48,842	41,369
Chemicals and allied products	5,293	20,910	63,754	56,177
Petroleum and coal products	1,365	6,520	19,285	19,933
Leather and leather products	3,626	7,897	16,301	16,668
Primary metal industries	2,617	11,600	29,597	20,727
Miscellaneous manufactures	4,502	14,960	23,564	16,139

*Withheld because the estimate did not meet publication standards, either on the basis of the associated standard error of estimate or on the basis of a consistency review. Source: U.S. Department of Commerce, 1954 Census of Manufactures, preliminary report.

Table III.—Mineral Production of Arkansas

(Short tons, except as noted)

Mineral	Quantity 1953	Value 1953	Quantity 1954*	Value 1954*
Total		\$127,090,000		\$131,745,000†
Barite	381,000	3,946,000	?	?
Bauxite	1,714,000	12,976,000	2,183,000	15,994,000
Clays	529,000	1,734,000	617,000	2,556,000
Coal	775,000	6,144,000	477,000	3,589,000
Manganese ore	6,000	527,000	14,000	1,021,000
Natural gas (thousand cu. ft.)	41,510,000	2,200,000	33,000,000	1,841,000
Natural gasoline (thousand gal.)	58,000	4,123,000	51,000	3,234,000
Petroleum (bbl.)	29,681,000	77,170,000	29,130,000	79,520,000
Petroleum gases (thousand gal.)	55,000	2,562,000	59,000	2,521,000
Sand and gravel	4,904,000	4,955,000	6,612,000	6,567,000
Slate	35,000	316,000	42,000	379,000
Stone	3,545,000	5,070,000	4,604,000	5,930,000
Other minerals . . . . .	...	5,367,000	...	9,230,000

*Preliminary. †Total has been adjusted to eliminate duplication in the value of clays and stone. ‡Value included with other minerals. Source: U.S. Bureau of Mines.

More than 10,000 additional persons were employed in Arkansas industry during 1955-56.

An increase of nearly 10% was noted in the tourist industry, bringing an estimated 9,000,000 persons to the state for business and pleasure, who spent an estimated \$200,000,000 in the state. (O. E. F.)

Mineral Production.—Table III gives the tonnage and value of those minerals produced in Arkansas in 1953 and 1954, whose value was \$100,000 or more. Arkansas accounted for 95% of the bauxite output (used for aluminum production), and was first in barite output and second in manganese output in 1954. It ranked 21st in value of mineral output, with 0.94% of the U.S. total.

ENCYCLOPEDIA BRITANNICA FILMS.—The Southeastern States (1956).

Armies of the World. During the year 1956 several major developments took place in the ground forces of the world.

A drastic change in the balance of arms power in the middle east was started by exchange agreements for military equipment between Egypt and Czechoslovakia. As a result Egypt strengthened its position as military leader of the Arab bloc, concluded several pacts for mutual action with its neighbours, and was able to furnish arms to other Arab nations. The flow of arms of Soviet origin into the middle east posed a major threat to Israel's ability to maintain equality with its neighbours.

Border incidents, some of serious proportions, continued between Israel and its neighbours, particularly Egypt, Jordan and Syria. Raids by Egyptian-trained guerrillas into Israel were countered by military action against Egyptian border posts, and on Oct. 29 Israeli forces invaded Egyptian territory in strength and soon conquered the Sinai peninsula.

Morocco gained its independence and the former colonial areas

of France and Spain and the international city of Tangier united into one country and organized an army. Meanwhile Algerian nationalists continued to engage a large proportion of the French army. French forces in Algeria reached as many as 400,000. With the war for independence in Algeria and the Suez canal crisis, France sent all but about 50,000 men of its regular forces out of the country.

Egypt's nationalization of the Suez canal was countered by an immediate redistribution of British and French forces to the middle east, although the Suez Canal zone had been evacuated by 80,000 British troops in June 1956. The British 10th armoured division was already in the area, half in Libya and the balance in Jordan and Cyprus. British strength on Cyprus was increased to a total of one parachute brigade, one commando brigade and eight infantry battalions. France sent elements of the 7th motorized division and the 10th parachute division from North Africa.

The Soviet Union announced a reduction of its armed forces by 1,200,000 men, and other nations of the eastern bloc also announced reductions in armed strength.

NATO.—Gen. Lauris Norstad (U.S. air force) succeeded Gen. Alfred M. Gruenther, also of the United States, as supreme commander of the forces of the North Atlantic Treaty organization (NATO). Major revisions were made in the organization and structure of component NATO forces as the strategy of nuclear deterrence was adopted. This strategy called for the use of tactical atomic weapons to defend western Europe. Within this strategy the use of conventional forces was limited and the requirement for extensive reserves reduced. The smaller countries of the Atlantic alliance were promised a wide variety of new weapons, including guided missiles and other nuclear-delivery systems, by Great Britain and the U.S. with the atomic warheads withheld until the imminence of hostilities. Stockpiling of heavy equipment and ammunition for 56 NATO reserve divisions was stopped and the material on hand added to the war reserves of the 40 active divisions in being. Seven western European nations agreed to prior agreement before any of them reduced their conventional armed forces in favour of nuclear weapons. Specific actions by NATO member nations included:

Iceland asked the U.S. to remove its troops.

France moved three full divisions and part of the combat strength of two other divisions, the sum total of all committed to NATO, to North Africa.

Italy dropped plans to organize 50 support battalions by 1958.

Norway commenced abandoning coastal defenses, rendered obsolete by the possibility of atomic attack.

Greece dropped plans for 5 active and 11 reserve divisions and concentrated on 4 active divisions.

NATO released the statistics on the defense expenditures of its 14 member nations during its seven-year existence, 1949-1956. Total expenditures were \$312,000,000,000, of which the United States spent \$250,000,000,000, while among other expenditures were: Belgium \$2,200,000,000; Canada \$9,700,000,000; Denmark \$670,000,000; France \$19,500,000,000; Greece \$625,000,000; Italy \$5,100,000,000; Luxembourg \$53,000,000; Netherlands \$2,300,000,000; Norway \$747,000,000; Portugal \$440,000,000; Turkey \$2,300,000,000; and Great Britain \$25,800,000,000. (It should be noted that these figures represent total defense expenditures of each nation; not solely the amounts allocated for NATO purposes.)

Warsaw Pact.—A formal military alliance of the eastern European nations was formed, consisting of the armed forces of the U.S.S.R., Czechoslovakia, Poland, Hungary, German Democratic Republic, Bulgaria, Rumania and Albania. These nations possessed a total of 250 divisions, and were under the command of Russian Marshal Ivan S. Konev. Warsaw pact nations announced manpower cuts of: U.S.S.R. 1,200,000; Czechoslovakia

34,000; Poland 47,000; Hungary 20,000; German Democratic Republic 30,000; Bulgaria 18,000; Rumania 40,000; and Albania 9,000.

SEATO.—The Southeast Asia Treaty organization members held their first combined manoeuvres, Operation "Firm Link," in Thailand in Feb. 1956. All member nations participated, although France and Pakistan only sent observers. Approximately 17,000 U.S., 15,000 Thai and 6,000 servicemen of other nations participated. The U.S. 2nd battalion 508th regimental combat team was airlifted to Bangkok from Japan, and a battalion of the 9th regiment of the U.S. 3rd marine division from Okinawa participated. A Filipino infantry battalion also was engaged.

Although SEATO possessed no military high command, staff talks of military advisors and liaison officers in Bangkok provided close liaison. The U.S., Great Britain and France helped the other member nations modernize, re-equip and train their forces. The U.S. provided training for almost 11,000 officers and noncommissioned officers, particularly from Pakistan, the Philippines and Thailand; France trained cadets from Pakistan and Thailand; and Great Britain trained personnel from Australia, New Zealand, Pakistan and Thailand. Strength of the SEATO powers in the southeast Asia area included:

Philippines, an army of 40,000 organized into two active divisions and two training divisions.

Thailand, an army of 90,000 men, organized primarily into battalions.

Australia, an army of 23,000.

New Zealand, an army of 9,200.

Great Britain, one combat division plus support troops.

France, a total of 25,000 men in Vietnam.

United States, two divisions in Korea, one in Japan, one in Hawaii and a marine division on Okinawa.

(See also SOUTHEAST ASIA TREATY ORGANIZATION.)

The Major Powers.—**Great Britain.**—*Organization.*—Defense expenditures dropped approximately \$100,000,000 during 1956, with about half of the amount from the army (\$47,600,000). The strength of the army was gradually being cut from 400,000, and there was discussion of reducing or abolishing the two-year conscription period. Army long-term plans called for a permanent future force of 180,000 regular soldiers plus 40,000 two-year conscripts. With the reduction in the strength of the army, consideration was being given to reducing the number of divisions in Germany from 4 to 2.

Divisional structures were reorganized for atomic warfare. Armoured divisions were cut from 10,000 to 8,000 men, and organized into battle groups each supported by an infantry brigade. Infantry battalions were streamlined with the heavy weapons company eliminated and its mortars and machine guns distributed to the three rifle companies. The base pay of soldiers was increased in an effort to get voluntary recruits to sign up for longer periods; those signing for less than six years would receive 3d 3s per week (\$8.81), while those for more than nine years received 4d 11s (\$12.74).

Disposition.—The strategic reserve maintained in the British islands consisted of the 1st and 3rd infantry divisions and the 24th infantry brigade. The 24th infantry brigade was organized as the army's model air-transportable unit. The Royal air force transport command maintained 13 Comet Mark II jet air liners and 6 Blackburn Beverly air freighters, the latter capable of carrying 94 fully equipped soldiers 1,000 mi. nonstop. This air transport could move the brigade to the middle east in 48 hr.

The 10th armoured division was stationed in Libya and on Cyprus. The 17th infantry division garrisoned Malaya, Singapore and Hong Kong. The 2nd infantry and 4th, 6th and 7th armoured divisions plus an independent brigade composed the army of the Rhine in Germany. Forces in Kenya were reduced from 6,500 to



PARENTS INSPECTING EQUIPMENT at Ft. Ord, Calif., in 1956. The visit to the camp, the first of its kind, permitted parents of recruits to see the activities of their sons in training

4,300. All but a battalion was withdrawn from Korea, and all troops were removed from Japan.

Of the 11 reserve territorial divisions, two numbering 18,000 men each were kept at full strength. The other nine reserve divisions were put on a stand-by basis, with eight of them all infantry at a strength of 12,000 men, and the 9th a reserve airborne division with five battalions of parachutists.

Communist China.—Defense costs accounted for 19.98% of the 1956 budget, or \$2,670,000,000. Military strength was 2,647,000, of which 2,500,000 were in the army. Marshal Peng, the defense minister, reported that 5,000,000 men had been fully demobilized since 1949 and that another 31 divisions and 8 regiments had been transferred as a whole to construction work.

Nationalist China.—The army was maintained at a strength of 21 divisions (12,000 men each) including two armoured divisions, plus a marine division. In addition the organization of nine reserve divisions was started. On Quemoy 70,000 troops and 20 artillery battalions were in place, plus 25,000 men and 2 artillery battalions on the Matsus.

France.—*Organization.*—Of a total budget of \$11,314,000,000, expenses for the war in North Africa were \$613,000,000. Forces in North Africa numbered 400,000 as 200,000 more reserves were recalled up to augment the forces there and replace the reserves whose period of service expired. Reserves recalled included those who served in 1952 and 1953. Approximately 200,000 of those troops who served in North Africa were demobilized.

Disposition.—The military command in Vietnam was closed in April 1956 as all but a few troops were withdrawn from that area. The five full strength NATO divisions and nine reserve divisions in France were depleted of combat strength, which was all sent to North Africa and replaced by reservists by retention of conscripts beyond the 18-month service period and by native North African troops. Elements of the 7th mechanized division and 19th parachute division which had been transferred from France to North Africa were in turn transferred to Cyprus at the time of the Suez canal crisis. In addition to the major part of these units, the 19th infantry division and 4th motorized infantry division were located in Algeria. The latter patrolled the Algerian-Moroccan border to prevent infiltration of arms into Algeria.

In North Africa three divisions were concentrated in the area along the Moroccan border around Tlemcen and Marnia, where barbed wire sealed off a neutral area. Heavy fighting took place

in the Kabylie region east of Algiers. Large areas were placed under military command and cleared of nationalists, following which mobile defense units of residents were organized and armed for self-defense.

United States.—*Organization.*—The strength of the army was cut to 19 divisions, 10 regiments and 143 antiaircraft battalions, with total personnel of 1,034,500. The 1st cavalry division in Japan was reduced by one-third. The 75th regimental combat team on Okinawa was disbanded, and the 23rd infantry division at Fort Amador, Panama Canal Zone, and the 71st infantry division in Alaska were deactivated. A new airborne division, the 101st, was reactivated, joining the 82nd and 11th as airborne units. Designed for nuclear warfare and "brush fires," the 101st had more firepower than the standard airborne divisions and could be air transported with half the number of aeroplanes. The division of 11,500 (compared with previous airborne strength of 17,300 for three regiments) was organized into 5 self-contained combat groups. New equipment included the Spat, a 90-mm. self-propelled gun deliverable by parachute; a family of lightweight trucks; lightweight general-purpose machine guns; 105-mm. mortars; "Honest John" rocket units; and an airborne television system.

The army reserve system was reorganized to provide for 10 combat divisions of 14,000 men each plus 12 cadre divisions for training. In addition, the army components of the national guard totalled 425,000 men organized into 21 infantry and 6 armoured divisions plus 9 regimental combat teams, 9 armoured cavalry regiments, 123 antiaircraft battalions and 74 field artillery battalions. (See also SELECTIVE SERVICE, U.S.)

Disposition.—The 101st airborne division was activated at Camp Campbell, Ky. The 11th airborne division was transferred from Camp Campbell to Germany to replace the 5th infantry division which returned to Fort Ord, Calif. The 3rd armoured division at Fort Knox, Ky., replaced the 4th infantry division in Germany, which returned to Fort Lewis, Wash. The 2nd infantry division at Fort Lewis replaced the deactivated 71st division in Alaska. The 8th infantry division at Fort Carson, Colo., and the 9th infantry division at Goppingen, Ger., exchanged places. Headquarters of the 1st armoured division was transferred from Fort Hood, Tex., to Fort Polk, La. Elements of the 1st cavalry division remained in Japan. The 7th infantry division and 24th infantry division stayed in Korea, and the 25th infantry division remained on Hawaii.

The 6th army headquarters in the United States were maintained, with the 7th army in Germany and the 8th army in Korea. Corps headquarters maintained included 1st corps in Korea, 3rd corps at Fort Hood, Tex., 5th and 7th corps in Germany, 9th corps in Japan and 18th airborne corps at Fort Bragg, N.C.

The 10th special forces group remained in Germany, but was reduced in strength as was the 77th special forces group at Fort Bragg, N.C. Six field artillery battalions, the 531st, 557th, 601st, 558th, 530th and 559th, trained to fire the Corporal guided missile, were transferred from Fort Bliss, Tex., to Europe to augment the one battalion already there. (These units of 250 men had 3 launchers each. The Corporal is a surface-to-surface missile with a range of 75 to 100 mi.)

Equipment.—New items under development included the T-101, an airborne 90-mm. self-propelled gun with a tanklike body and a hull of light metals. With no turret and a crew of 3, the T-101 has a 6 cylinder air-cooled engine of 205 h.p. and a speed of 30 m.p.h. Experiments were conducted with a 4.2-mm. mortar mounted on an armoured personnel carrier. A combat radio helmet was under consideration for use in infantry units. Also being experimented with was a portable TV transmitter of 55 lb. capable of transmitting pictures a half mile. Among new equipment ordered were 600 M-48 Patton tanks mounting a 90-mm. gun

which had proven itself under nuclear attack in Task Force "Razor." Guided missiles were an important item of new equipment. Four in use and in the experimental stage included: the Dart, an antitank guided missile; the Corporal, a guided rocket; the Honest John, an unguided rocket of limited range; the Redstone, an intermediate range missile of 200 mi. range. (See also MUNITIONS.)

Training.—Several major training exercises were held during the year. "Lode Star," held at Camp Carson, Colo., tested cold weather and mountain operations in three phases over a 9-month period. "Command Post" held in various army areas in continental United States, tested ground support operations under atomic warfare conditions. "Cold Spot," involving 3,500 troops of the 1st infantry division and the 77th special forces group, dealt with mountain training. "Red Arrow" concerned the 1st infantry division at Fort Riley, Kan. "Northern Light," a two-month operation in Alaska, occupied the 82nd airborne division with airborne operations in the Arctic. "Sledge Hammer," at Fort Polk, La., stressed armoured manoeuvres of the 1st armoured division.

U.S.S.R.—The Soviet Union announced the further demobilization of 1,200,000 men to follow the original reduction of 640,000 men, with the target date of May 1, 1957, set for completion. The announcement stated that this would involve the disbanding of 60 infantry divisions and several brigades. The previous size of the army had been set at 175 to 200 divisions, of which 100 were at full strength. The reduction would probably bring the strength down to about 125 divisions, built around the 45 mechanized and 20 armoured divisions that constituted the bulk of the mobile strength. A reduction of 8.5% in expenditures for the armed forces resulted in the defense budget accounting for 18.2% of the total in 1956 compared with 19.9% in 1955.

Disposition.—As part of the demobilization plan, 33,500 troops were withdrawn from East Germany, although the 22 ground divisions there were not affected. In the Soviet Union approximately 60 divisions were maintained in western Russia and 40 east of the Urals.

Equipment.—The T-54 tank replaced the T-34 as standard equipment. The T-54, with a 100-mm. gun compared with the 85-mm. gun of the T-34, was powered by a long-range diesel engine, and had a high-quality aiming device particularly adapted for night firing. Considerable improvements were also made in standard artillery pieces: the range of the 122-mm. gun was increased to 25,000 yd.; the new 152-mm. gun was an improved version of the World War II gun; and the 203-mm. gun with a range of 28,000 yd. was towed by a prime mover. In addition, artillery support included a 240-mm. mortar, and 4-, 12- and 16-in. rocket launchers. Infantry firepower was increased by the distribution of 9-mm. automatic pistols. The mobility of the army was improved with the 4-wheel drive Pobeda trucks, and by the use of twin-rotor helicopters capable of carrying 50 men.

Afghanistan.—Afghanistan was reported to be using a portion of its \$100,000,000 loan from the Soviet Union for the purchase of arms from Czechoslovakia. Pakistan reported to SEATO that the Afghans had set aside \$40,000,000 for arms purchases that included rifles and light machine guns, and that some of these arms were reaching the Pathan tribesmen in the area of Push-toonistan currently under dispute between the two countries. Afghanistan sent a military mission to Czechoslovakia to inspect latest military equipment. The Afghan army of 50,000 remained mainly equipped with 1903 model Lee-Enfield rifles.

Austria.—This country started developing the army of 53,000 authorized under the peace treaty. Using the 6,000 frontier guards as a base, the army received at six-month intervals 12,000 recruits of the 20-year-old class drafted for 9-month periods, or 15 months if technicians. The goal was formation of 9 inde-

pendent brigades (or an over-all total of 108 battalions). Five of these would be mountain troops. Each brigade would have 3 regiments of infantry, a battalion of medium and light tanks, a battalion of artillery and one of signals and specialized troops. Equipment would come from the United States, but would initially consist of that left behind by Soviet, French, British and U.S. occupation troops.

Cambodia.—Cambodia announced that it would equip a 40,000-man army with U.S. matériel.

Canada.—Canada spent \$1,775,000,000 for defense in 1956, or 40% of the budget. A total of 24.7% of the defense expenditure was on the army of 47,000.

Czechoslovakia.—This country continued to maintain a strong separate national force, allied to, but not part of, the Soviet army. An announced cut of 34,000 men brought army strength to 230,000, organized into 4 armoured and 10 infantry divisions.

Egypt.—Egypt concluded a series of mutual defense pacts with Saudi Arabia, Yemen and Jordan, which together with that with Syria put the bulk of the Arab forces in a single command. Its cotton-for-arms deal with the Soviet bloc continued to bring in arms at the rate of about two shiploads a week. An analysis of the arms received during the year other than from the Soviet bloc showed: the last of a \$10,000,000 order from France including Mystère jets, light tanks and mortars; possibly about 16 Vampire jet aircraft from Italy; reconditioned British Valentine tanks, Bren gun carriers and armoured cars from Belgium. In addition, the production of Swedish-type M-45 submachine guns and automatic rifles was accelerated in the Maadi plant.

The army's strength was between 90,000 and 100,000, but this was augmented by the creation of a National Liberation army composed of the 50,000-man national guard plus youth volunteers. The National Liberation army was trained primarily for guerrilla warfare. Total trained reserves were 220,000.

An indication of the quality of the army equipment was given in the June 20 parade celebrating the taking over of the Suez canal from the British. Armoured equipment included: 28 Stalin tanks, 16 British Centurian tanks, 73 Czech-manufactured T-34 tanks and 96 Soviet-type ABC six-wheeled troop carriers; the artillery included 14 tractor-drawn 155-mm. guns; 25 Soviet SU-101 self-propelled antitank guns plus British 25 pounders; Swedish 40-mm. Bofors; the air cover included 23 MIG fighters, 24 Vampires, 9 Meteors and 23 Ilyushin twin-jet bombers.

Finland.—Finland maintained an army of 30,000 men, all but 1,000 of which were conscripts. Universal conscription required eight months' service and men were inducted quarterly during their 19th year. Equipment was mainly from World War II.

East Germany.—A formal announcement of the establishment of the Peoples army and its association with the Warsaw pact was made Jan. 1956. The strength of the army was 99,000. Matériel was not good. Total combat strength was seven divisions. Officers were reported training in Soviet Kazakhstan, and the U.S.S.R. delivered six atomic cannons.

West Germany.—The Bonn government enacted 14 constitutional amendments in March 1956 legalizing armaments and establishing civilian and military controls over the armed forces. Pertinent provisions included: a permanent parliamentary commission to control and investigate the armed forces; a 2/3 vote of the *Bundestag* before the armed forces could be used for internal police purposes; the *Bundestag* alone could decide when a state of war exists; the president could appoint and dismiss officers. A conscription bill requiring one-year's service was passed and registration of men 18 to 45 scheduled for Jan. 2, 1957, with the first call-up of 40,000 conscripts to be April 1, 1957. As a result of the short-term conscription, the army would consist of approximately 300,000 regular soldiers and 200,000 conscripts. During 1956 volunteers for the army averaged 4,500 a week, and

approximately 70,000 were in the army by the end of the year. Although no combat units were in operation, the cadres of five divisions (two armoured and two infantry divisions, and one parachute and one mountain brigade) were organized. There were ten instructional battalions and a school for field-grade officers. Eventual organization of the army called for six armoured and six motorized divisions by 1960, with interim stages of five armoured and three motorized divisions and an airborne and a mountain brigade by the end of 1957.

Germany agreed to continue to assist in the support of NATO troops stationed there, although the previous payment of \$760,000,000 annually was reduced to \$357,000,000 with \$154,700,000 to the U.S., \$95,200,000 to support British forces and the balance to others.

In addition to U.S. deliveries of \$476,000,000 worth of equipment under the Military Assistance program, orders were planned for 6,600 tanks and armoured assault vehicles for \$714,000,000 from the United States and Great Britain.

Hungary.—Hungary announced a cut in defense expenditures of \$350,000,000 for 1956 and a reduction in armed strength of 20,000 men.

India.—India launched a program of military modernization and ordered 40 British Centurian tanks, 40 Canberra jet bombers and other British equipment. The defense budget was \$420,000,000.

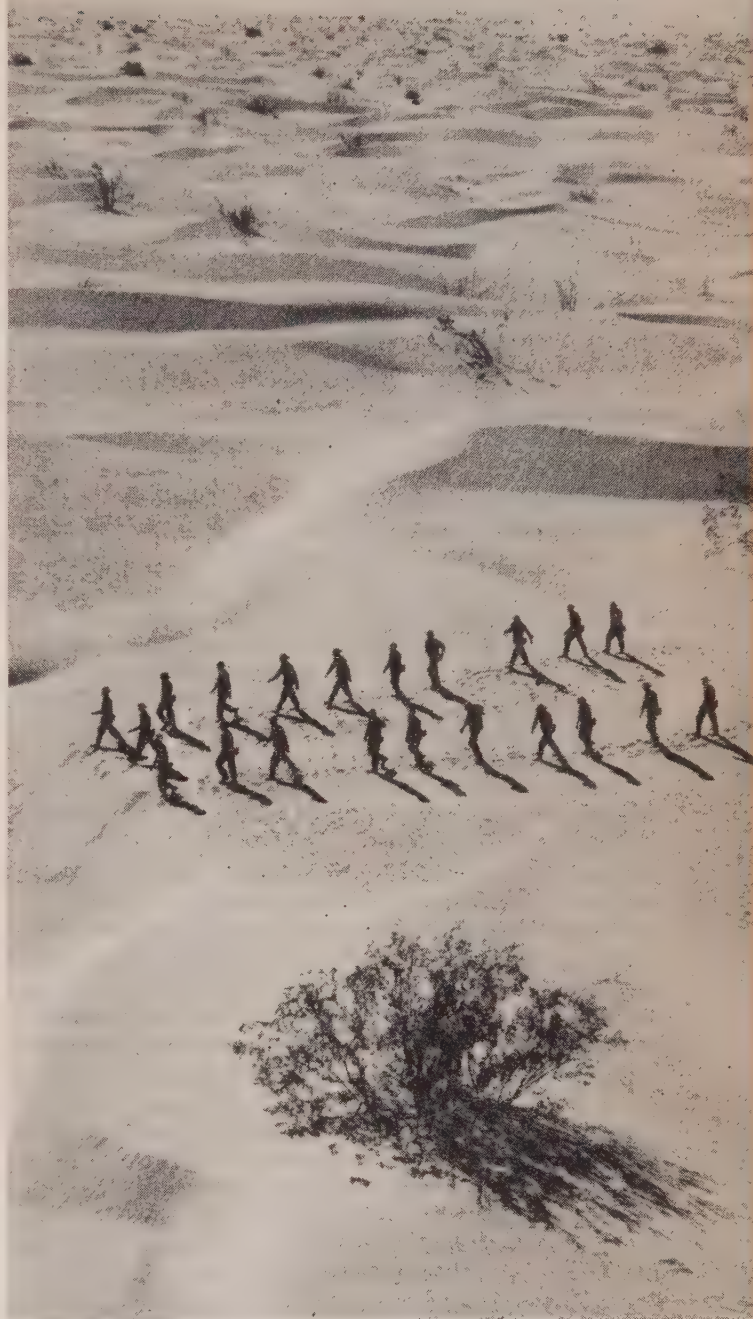
Iran.—Iran maintained an army of 150,000, partly U.S. equipped and trained, organized into nine infantry and three armoured divisions.

Iraq.—Although a member of the Baghdad pact, Iraq offered military assistance to Syria and Lebanon in the event of hostility from Israel; additional Mark VII Centurian tanks were delivered under the U.S. military aid program. The army was maintained at about 50,000 men organized into three divisions.

Israel.—Israel attempted to maintain the balance of arms in the middle east by obtaining additional equipment from the United States, Britain and France. Existing equipment was mixed and included U.S. Sherman tanks, French 155-mm. howitzers and French AMX tank destroyers equipped with a 75-mm. high-velocity gun. Infantry arms included the UZI submachine gun, manufactured in Israel, which was replacing British Sten guns. The defense budget was \$27,778,000. About 50,000 men were maintained on active duty. They were organized into three brigade groups supported by 20 independent tank companies of 12 tanks each plus two battalions of paratroopers. Within 48 hours this force could be expanded to 16 first-line brigade groups (250,000 men), and an additional 12 second-line groups could be mobilized in the event of need. The regular 2½ year conscription period was increased to 3½ years for the duration of the emergency.

Japan.—Japan passed a defense budget of \$250,000,000—an increase of 13% over 1955. Of the budget \$150,000,000 was for the army and permitted an increase of 10,000 in manpower to 160,000. The army was organized into six divisions of which two, plus a composite brigade, were on Hokkaido, one on Kyushu, and the others on Honshu and Shikoku. An agreement was reached with the United States whereby Japan's share of the joint defense costs (maintaining U.S. forces in Japan) would be decreased each year by half of the total increase in Japan's defense budget.

Jordan.—In March 1956 King Hussein dismissed Lt. Gen. Sir John Bagot Glubb, who had organized and then commanded the Arab legion for 36 years. Glubb was replaced by Brig. Gen. Radi Enab, who in turn was replaced by Maj. Gen. Ali Abu Nuwar in May 1956. With Glubb, all but 15 of the 60 British officers in the Arab legion were let go and replaced by Jordanians. The strength of the Arab legion was maintained at approximately 28,000 or-



U.S. ARMY EQUIPMENT TESTING TEAM on the desert near Yuma, Ariz., in 1956. Working in temperatures constantly near 100° F., the men shown above were testing tropical footwear. The new boots lasted 150 mi.

ganized into an infantry division, two armoured-car regiments and an antitank regiment. The national guard was expanded from 10,000 to between 30,000 and 40,000 men, and an Arab military aid program was organized to finance the expansion with \$10,000,000 raised by contributions of 25% each from Egypt, Saudi Arabia and Iraq, 10% from Syria and the balance from Lebanon and Jordan.

In addition to the long-standing mutual defense treaty with Britain and one with Iraq, agreements were reached with Lebanon to co-ordinate defense plans and unite forces in the event of war, and with Syria for a permanent body for military consultation and for joint operations in the event of war.

Arms and equipment were received from Egypt and Syria, and Iraq maintained a motorized brigade of 3,000 men near the border to aid in the event of an emergency. It was agreed that any joint Iraqi-Jordanian force operating from Jordan would have a Jor-

danian commander and an Iraqi deputy commander.

North Korea.—The North Korean government maintained an armed force of approximately 790,000 men, of which 300,000 were Chinese. The troops were reported to be trained in atomic warfare and equipped with artillery and missiles capable of firing atomic warheads.

South Korea.—South Korea maintained an army of 700,000 men organized into 20 army and 1 marine divisions on active duty and 10 reserve divisions. The U.S., which supplied \$400,000,000 yearly for military aid, agreed to support three additional divisions increasing the total from 31 to 34 divisions.

Libya.—The army in Libya was in process of being strengthened from 1,600 to 2,600 men. The U.S. and Britain sent about \$1,000,000 in arms to equip an armoured squadron. Equipment received included eight armoured half-track reconnaissance cars with .50- and .30-calibre machine guns, 81-mm. mortars and weapons carriers. Libya also received arms offers from Egypt and the U.S.S.R.

Morocco.—Morocco became an independent nation in March 1956 and established a royal army of 20,000 men, including 5,000 from the former "army of liberation." There remained sizable unabsorbed guerrilla bands in eastern Morocco and on the southern frontier with the French Sahara. The royal army was equipped by the French with \$3,000,000 worth of tanks, armoured cars, half-tracks, 105-mm. guns, jeeps, weapons carriers and trucks. The infantry was organized into 11 battalions. Ultimately, the 40,000 Moroccans still in the French army were to be absorbed into this force.

Poland.—Poland asked for the withdrawal of the two Soviet divisions from its territory and the recall of the Soviet officers which had been integrated into the Polish army in large numbers. This included Soviet Marshal Konstantin K. Rokossovsky, who had been defense minister and chief of staff of the Polish army since 1949. Strength was 18 combat divisions.

Sudan.—Following the establishment of Sudan's independence on Jan. 1, 1956, two shipments of arms were received from Egypt including 18 armoured cars, 18 tanks and 18 Bren gun carriers.

Sweden.—Sweden commenced reorganizing its army for atomic warfare into smaller regiments each composed of three battalions of three rifle companies (150 men each). The armoured brigade was equipped with British Centurian and Swedish light tanks.

Syria.—Syria was reported to have an agreement for the purchase of arms with the Soviet bloc. Staff discussions were held with Egypt and a joint command over the armies of both countries was headed by Egyptian General Mustafa Yusef, who also

headed a joint Egyptian-Saudi Arabian command. The army was maintained at more than 40,000 men. A bilateral defense pact was concluded with Lebanon providing for joint retaliation in the event one was attacked.

North Vietnam.—The Communist government maintained an army of 350,000 men equipped by Communist China. However, an announcement in June 1956 stated that a reduction of 80,000 men was being made, including 50,000 already demobilized since the 1954 armistice.

South Vietnam.—The strength of the army in 1956 was 150,000 men, supplemented by a 40,000-man National Security force and 50,000 village militia. During 1955 the United States supplied \$235,000,000 for defense as well as equipment for the army. The Vietminh were estimated to still have about seven battalions of guerrillas in the country.

(See also AVIATION, MILITARY; MUNITIONS; NAVIES OF THE WORLD; NORTH ATLANTIC TREATY ORGANIZATION.)

(L. B. K.)

Armstrong, Louis ("Satchmo") (1900–), U.S. jazz musician, was born in New Orleans, July 4. He gained local prominence playing the trumpet with Kid Ory's Brownskin Babies and Fate Marable's Mississippi river boat orchestra. In 1922 he joined Joe "King" Oliver in Chicago and two years later joined Fletcher Henderson in New York, where he began his long recording career. During the next seven years he worked with various bands in New York, Chicago and Los Angeles, the more prominent being Erskine Tate, Carroll Dickerson, Luis Russell and Les Hite. It was during this period that he organized his Hot Five and Hot Seven groups, with whom he made many recordings.

The success of his recordings abroad led to his first overseas tour in June 1932 when he played at the Paladium in London. The following year he returned to Europe for a second continental tour, and remained there until 1935. On his return to the United States he took over the Luis Russell orchestra.

During and after World War II he worked almost exclusively with small bands, making many tours of Europe and one of Japan and Australia. He also appeared in ten motion pictures and one stage production.

In 1955 Armstrong and his jazz band played to capacity houses on his three-month good-will tour of Europe, and in May 1956 attracted huge crowds on a tour taking him to London, Eng., Glasgow, Scot., and the African Gold Coast.

Armstrong was the first great jazz figure to attain world-wide recognition, not only as a trumpeter but as a singer and entertainer, and a vital force in stimulating international interest in jazz. The emotional intensity and basic simplicity of his solos, particularly in playing the blues, had no parallel in jazz.

(M. E. HL.)

Army, U.S. Department of: see GOVERNMENT DEPARTMENTS AND BUREAUS, U.S.

Arsenic: see MINERAL AND METAL PRODUCTION AND PRICES.

Art: see ARCHITECTURE; ART EXHIBITIONS; ART SALES; DANCE; MUSEUMS; MUSIC; PHOTOGRAPHY; PRINTING; SMITHSONIAN INSTITUTION; THEATRE; and the Literature articles such as AMERICAN LITERATURE; ENGLISH LITERATURE; etc.

Art Exhibitions. One of the few great private collections to be kept intact was the Jacquemart-André collection in Paris which was deeded to the Institut de France in 1912. Covering a wide period, it includes paintings by Andrea Mantegna, Carlo Crivelli, Vittorio Carpaccio, Paolo Uccello, Rembrandt and J. H. Fragonard. During 1956 an important selection from the collection was shown at the Wildenstein gal-

FROGMEN SEARCHING FOR MINES on a beach at Portsmouth, Eng., during a 1956 demonstration of amphibious warfare techniques for the staff colleges of the three British armed services



lery in New York city.

In honour of the bicentennial of the birth of the great composer Wolfgang Amadeus Mozart, the William Rockhill Nelson Gallery of Art in Kansas City arranged an exhibition of rococo art, including not only paintings of the 18th century but also furniture and decorative objects.

One of the most spectacular exhibitions of the season was at the National Gallery of Art in Washington, D.C., which celebrated its 15th anniversary with an exhibition of art objects acquired during the last five years by the Kress collection and the Kress foundation. These objects, which were expected to be given to the gallery at a later date, included a great painting by Rubens, "Decius Mus Addressing the Legions"; J. B. Chardin's "The Attentive Nurse" (from the Liechtenstein collection); a "Madonna and Child" by Albrecht Dürer; and, from the collection of Sir Francis Cook, "The Adoration of the Magi" by Fra Angelico and "The Swing" by Fragonard.

Walter P. Chrysler, Jr., sent a selection of his collection on tour to eight museums: Portland, Ore.; Seattle, Wash.; San Francisco and Los Angeles, Calif.; Minneapolis, Minn.; St. Louis and Kansas City, Mo.; and Detroit, Mich. The group included a great variety of artists, old masters such as Rembrandt, Rubens, Paolo Veronese and François Boucher as well as more recent artists such as Claude Monet, J. E. Vuillard and Chaim Soutine.

The Yale Art gallery showed "Pictures Collected by Yale Alumni," 250 oils, water colours and drawings lent by 100 graduates. The wide variety of material extended in date from the 15th-century Flemish artist Hans Memlinc to the contemporary U.S. artist Andrew Wyeth. Although well-known paintings such as the Paul Cézanne "Card Players" were lent by Stephen Clark, and other notable collectors such as John Hay Whitney, Averell Harriman and Charles S. Payson were generous in their loans, numerous less well-known collectors provided pictures unfamiliar to the general public.

The Cloisters of the Metropolitan Museum of Art, greatest collection of mediaeval art in the U.S., exhibited 40 new additions to its already rich store of objects. Notable among these was the reliquary of St. Stephen from the Meuse valley in Belgium, dated about 1220, and the bust of a bishop, dated 1438, intended to receive the relics of St. Lawrence. This was discovered tarnished and forgotten in a London antique shop.

An exhibition of 600 pieces of early Philadelphia silver was featured at the Philadelphia Museum of Art, while the Minneapolis Institute of Arts showed two centuries of English and American silver.

The University Museum of the University of Pennsylvania, Philadelphia, organized a comprehensive exhibition of African tribal sculpture, selected entirely for aesthetic value and bringing out the ever-increasing appreciation of the arts of primitive peoples.

"Visionaries and Dreamers" was the title of an unusual exhibition at the Corcoran Gallery of Art in Washington. This side of 19th-century art is largely remembered through the work of Odilon Redon, but the exhibition featured not only Redon but also P. C. Puvis de Chavannes and Gustave Moreau.

The John Herron Art museum, Indianapolis, Ind., in honour of the gift of three paintings by Joseph M. Turner and a set of his *Liber Studiorum*, arranged an important Turner exhibition including oils, water colours and drawings. Well received by an enthusiastic audience, the exhibition proved timely, for Turner's influence on later 19th-century painting was being increasingly recognized.

In honour of the centenary of John Singer Sargent's birth, the Museum of Fine Arts in Boston arranged "Sargent's Boston," a nostalgic showing of the numerous portraits as well as designs for murals which he did in the Boston area.

A. W. Bouguereau, the great figure in 19th-century French salon art, was given an exhibition at the University of Southern California at Los Angeles. Long ago discarded as a painter of ponderous, cold, academic subjects, his revival was felt to be of value to contemporary students in revealing his skill as a draughtsman.

A survey of the architect Louis Sullivan, honouring the centenary of his birth, was organized by the Art Institute of Chicago. Effectively arranged with large blow-up photographs, mostly taken by John Szarkowski, and original drawings and examples of ironwork, the exhibition showed dramatically the work of Chicago's early modern architect.

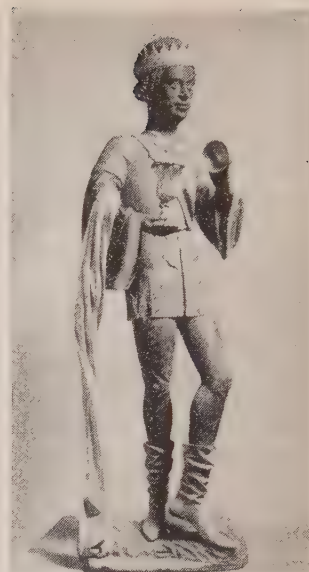
Probably the most spectacular as well as the most popular exhibition of the 1956 season was a full-scale showing of the work of Henri de Toulouse-Lautrec (1864-1901), the joint effort of the Philadelphia museum and the Art Institute of Chicago. Composed of paintings, posters, drawings and lithographs, the group was greatly enlivened by numerous loans from the Musée d'Albi in France never seen before in the United States.

Perhaps the most exquisitely displayed exhibition of the season was the comprehensive one-man showing of the sculpture of Constantin Brancusi at the Solomon R. Guggenheim museum. His work, either primitivelike in wood or in exquisitely polished stone or metal, is most simplified, the very essence of sculptural forms. Rumanian-born but long resident in Paris, Brancusi caused a sensation with his egglike sculptures in the Armory show of 1913.

The Museum of Modern Art exhibited the welded metal sculpture of Julio Gonzales, the Spanish artist who died in 1942. Having learned to weld metal in the Renault factory during World War I, he turned to welded sculpture and was virtually the founder of this art form. The Modern museum combined with the Minneapolis Institute of Arts in an exhibition of prints by the German artists Ernst Kirchner and Emil Nolde. The Museum of Modern Art showed "Masters of British Painting, 1800-1950," from the landscape revolt led by Turner and Constable, the literary pre-Raphaelites, down to the modern abstract movement led by Ben Nicholson and Graham Sutherland.

The Whitney Museum of American Art during the course of the season held one-man showings of the work of three distinguished contemporary U.S. artists. One was a retrospective of the water colours of Charles Burchfield, whose romantic concepts, large in scale, have made water colour into a monumental medium; another was Morris Graves, the sensitive painter and gifted draughtsman from the northwest whose eerie shore birds are ever-compelling; and the third, the most dramatic and exciting, was the sculpture and drawings of Theodore Roszak.

A new exhibition, "Caribbean International," was inaugurated by the Museum of Fine Arts of Houston, Tex., sponsored by Brown and Root, Inc. It included artists from the five Gulf states and Central-American countries. The exhibition went on tour to Dallas, Tex.; Pittsburgh, Pa.; Utica, N.Y.; and Boston, Mass.



GERMAN WOODCARVING, a polychrome and gilded 15th-century statue of one of the "Three Kings from Lichtenthal"; an example of German art, 14th-20th centuries, on display at the Metropolitan Museum of Art, New York city, in 1956

The United States was represented in the 28th Venice Biennale by "American Artists Paint the City," 46 paintings selected by the Art Institute of Chicago, composed of canvases of both fact and symbol by such diversified artists as John Marin, Edward Hopper, Stuart Davis and Jackson Pollock.

The Tate gallery in London showed "Modern Art in the United States," sent by the Museum of Modern Art and composed of paintings by Jackson Pollock, Willem de Kooning, Mark Rothko, Franz Kline and other abstractionists. Although described in the *Times* of London as "Yankee Doodles," the effect of the showing on Europe was strong. (F. A. Sw.)

Great Britain and Europe.—During 1956 the Royal academy in London continued its admirable series of winter exhibitions. As an accompaniment to a unique presentation of Portuguese art which had opened at the end of 1955, one wing of Burlington house was devoted to an intriguing display of English 18th-century furniture, pictures, marbles, tapestries, porcelain and plate. In marked contrast with the mannered elegance of these pieces, the Tate gallery, in conjunction with the Arts Council of Great Britain, provided a first opportunity of seeing a comprehensive cross section of modern United States art.

The Institute of Contemporary Arts presented "Ten Years of English Landscape Painting, 1945-55," which contained a preponderance of pictures by the new generation of artists. In a show of variable quality, Peter Lanyon, Patrick George, John Bratby and Phillip Sutton were outstanding. Frank Auerbach, at the Beaux-Arts gallery (in his first one-man show), and Peter Coker at the Zwemmer gallery were impressive. At the Marlborough gallery, among works by several young painters of diverse nationalities all working in Paris, René Aberlenc showed pictures of considerable merit and interest.

Meanwhile, in Brussels, the Palais des Beaux-Arts staged a large retrospective exhibition of Joan Miro's work. In Germany the masterpieces of the Pinakothek museum of Dresden were on view after ten years' exile in the U.S.S.R. This magnificent collection, made by the princes of Saxony during the 18th century, included Raphael's "Sistine Madonna" and many other of the greatest examples of European painting.

In Paris early in 1956 the Musée Galliera devoted its new rooms to a highly successful exhibition entitled "Poétique de la Nature." It was the first exhibition by a new group, two painters (Roger Chapelin-Midy and Yves Brayer), a sculptor (Louis Leygue), an engraver (André Parinaud) and a designer (Jean Picart le Doux). In February two simultaneous exhibitions by Bernard Buffet were to be seen at the Galerie Drouant-David and the Galerie Visconti. After his preoccupation in 1955 with the horrors of war, Buffet had turned his attention to circuses, sad circuses, seen from the point of view of the performers. Other Parisian exhibitions of interest and importance, held in the first months of the year, were paintings of the nude by Othon Friesz at the Galerie Montmorency, 42 canvases by Chaim Soutine at La Maison de la Pensée Française, and large retrospectives dedicated to the work of Maurice de Vlaminck and Nicolas de Stael at the Galerie Charpentier and the Musée National d'Art Moderne, respectively.

In May the Royal academy opened a more progressive summer exhibition than usual, and the Tate gallery, in conjunction with the director of the Hamburg Kunsthalle, presented "A Hundred Years of German Painting, 1850-1950."

At the Royal Watercolour society's galleries an imposing exhibition of large canvases by Paul Rebeyrolle was staged by Marlborough Fine Art, Ltd.

The year 1956 was the 350th anniversary of Rembrandt's birth at Leyden. In Berlin, at a new museum at Dahlem in the western suburbs, 26 paintings, 144 drawings and 249 etchings were shown in an exhibition which not only marked the artist's anniversary



"BAR AND GRILL" by Morton Roberts, awarded the Benjamin Altman figure painting prize at the 1956 exhibition of the National Academy of Design, New York city

but the return to Berlin of some of its scattered treasures. Special displays of Rembrandt's etchings and drawings were on view at the print room of the British Museum and in the Galerie Mansart of the Bibliothèque Nationale in Paris. At the Rijksmuseum at Amsterdam there was a wonderful loan exhibition drawn not only from Dutch sources but from many countries of three continents. The arrangement of the 101 pictures covered the whole span of Rembrandt's active life from 1626 until 1669. Concurrently, the Boymans museum at Rotterdam showed a splendid collection of 260 drawings.

A record number of 34 nations took part in the 28th Venice Biennale. After an absence of 22 years the U.S.S.R. displayed the development of Soviet art since 1934. Participating Asian countries included India, Vietnam and Japan. For the first time Turkey, Iran and Ceylon sent exhibits. Retrospective shows were devoted to the works of Eugène Delacroix, Pieter Mondriaan and Juan Gris. The major prize for painting went to Jacques Villon, for sculpture to Lynn Chadwick.

In London during July and August a unique preview of six of the ten stained glass windows for Coventry cathedral was arranged at the Victoria and Albert museum. At the Tate gallery an exhibition of the creations of Wyndham Lewis' vorticist world preceded a small and choice collection of Cubist paintings lent by the Musée National d'Art Moderne.

The Festival exhibition at Edinburgh, the fifth to be devoted to a French painter, was a sumptuous collection of more than 80 paintings by Georges Braque.

Other autumnal exhibitions in Europe included paintings, sculpture and pottery by Marc Chagall at the Basle Kunsthalle, paintings and drawings by the Caracci at the Archiginnasio at Bologna, paintings, water colours and pastels by Georges Rouault at the Palais de la Berbie at Albi and, in commemoration of the 150th anniversary of his death, drawings and paintings by Fragonard at the Musée des Beaux-Arts at Besançon.

(See also ART SALES; MUSEUMS.) (F. W. W.-S.)

Arthritis: see RHEUMATIC DISEASES.

Arthritis and Rheumatism Foundation: see SOCIETIES AND ASSOCIATIONS, U.S.

Artificial Weather: see METEOROLOGY.

Art Sales. During 1956 the Parke-Bernet galleries in New York city, America's leading auction house, grossed \$5,567,538 in 82 sales, exceeding the previous season by more than \$100,000. The three top sales were the Oliver B. James collection of modern paintings (\$207,175); Baron Cassel van

Doorn's collection of French 18th-century furniture, painting and sculpture (\$271,175); and 18th-century English furniture, paintings and objects of art from a New York mansion (\$287,062). Although prices continued to rise, they were not so high as in the Paris and London auctions. Parke-Bernet's top price for a painting was \$37,000 for a "Bouquet of Flowers" by Vincent van Gogh; next came "Petite Danseuse," a bronze by Edgar Degas at \$30,000, and two Paul Gauguins at \$24,000 and \$25,000, respectively. Prices for old masters were less—\$13,000 for George Romney's "Marchioness Townsend"; \$12,000 for Sir Joshua Reynolds' "Richard Barwell and Son"; and \$19,000 for a pair of Canalettos.

In 74 sales during the season, total sales of the Plaza Art galleries of New York city amounted to \$1,862,550. Major sales were the estates of Helen Fahnestock Hubbard, Countess de Kotzebue and Helen Medham. In two sales the Metropolitan Museum of Art sold a quantity of paintings and other objects of secondary importance which brought \$179,795. An unusual sale was a group of cigar store Indians and other trade signs from the Haffenreffer collection which totalled \$54,700.

In London the top auction price was obtained at Sotheby's, \$81,200 for Nicolas Poussin's "Nativity" from the collection of Jocelyn Beauchamp of Langley park, Norwich, and at one time in the collection of Sir Joshua Reynolds. A Hendrick Avercamp, "Winter Landscape With Gentlemen Playing Kolf on a Frozen River," was sold for \$39,000, and Rembrandt's "Portrait of the Artist's Sister" brought \$46,200. At Christie's a record price of \$48,800 was paid for a pair of *capricci* by Francesco Guardi. Christie and Sotheby together did a 1956 season's business of approximately \$12,600,000.

Nearly all art objects had risen in price, with the result that auction sale totals were on the increase, despite the fact that paintings of spectacular quality had become a rarity on the market. Many of the greatest collections had already been broken up and their greatest treasures for the most part had found their way to museums. Smaller collectors made up the bulk of the contemporary buying public. Great price increases were noted in certain comparatively modern pieces such as objects by Faergé; a Siberian jade chimpanzee brought a record \$14,000. Manuscripts of books also brought record prices, such as Somerset Maugham's *The Moon and Sixpence* (\$7,280) and George Bernard Shaw's *John Bull's Other Island* (\$7,840).

In Paris a group of Cézanne oils and water colours was sold at the Galerie Charpentier. A Cézanne water colour, "The Bath," brought \$6,000, while the three highest-priced oil paintings were "Five Bathers," \$54,571, "Jas de Bouffan," \$46,000, and "Louveiennes," \$35,714. Other high prices in the same sale were a Degas ballet scene which sold for \$64,285; Auguste Renoir's "Young Woman With Trimmed Hat," \$54,571; Gauguin's "Peasant With Dog," \$52,857; and Henri de Toulouse Lautrec's "Tommy, Cocker Spaniel," \$28,571. (F. A. Sw.)

Aruba: see NETHERLANDS ANTILLES.

Asbestos. Based on U.S. bureau of mines data, Table I gives the world production of asbestos, including details by leading countries, and Table II gives data on the U.S. situation.

United States.—The United States produces less than 5% but consumes almost 50% of the world production of asbestos. The main commercial variety of asbestos is chrysotile, produced chiefly by Canada which supplies the U.S. with most of its large requirements. Arizona is the only domestic source of low-iron chrysotile asbestos fibres for electric cable coverings.

Canada.—Six companies produced 1,058,937 tons of asbestos ore in 1955. Of this total, the world's largest asbestos producer

Table I.—World Production of Asbestos

	(In thousands of short tons)						
	1949	1950	1951	1952	1953	1954	1955
United States	39	42	52	54	54	48	45
Canada	522	875	973	929	911	924	1,092
Italy	16	24	25	26	22	26	33
U.S.S.R.	191?	240?	240?	240?	240?	240?	240?
Cyprus	13	17	19	18	16	17	17
South Africa	64	87	107	134	95	109	120
Southern Rhodesia	72	72	78	85	88	80	105
Swaziland	31	33	35	35	30	30	33
Other	27	35	41	39	49	56	70
Total	975	1,425	1,570	1,560	1,505	1,530	1,755

Table II.—Asbestos Industry in United States

	(In short tons)				
	1951	1952	1953	1954	1955*
Domestic asbestos					
Production	51,730	53,888	57,950	45,813	44,752
Sold or used by producers	51,645	53,864	54,456	47,621	44,580
Imports (unmfd.)	761,873	709,419	692,245	678,390	740,423
Exports (unmfd.)	16,526	10,724	3,076	1,894	2,787
Apparent consumption	796,992	752,559	743,625	724,117	782,216

*Preliminary. †Includes re-exports.

accounted for 56%. More than 95% of the output is exported; 70% to the United States. In 1956, the company began mining underground its large open-pit operation. At the 750-ft. depth level, the mine output of ore was expected to be 60,000,000 tons over a 10-year period. (F. E. H.; B. B. M.)

ASCAP (American Society of Composers, Authors and Publishers): see SOCIETIES AND ASSOCIATIONS, U.S.

Ascension: see ST. HELENA.

Asia: see AFGHANISTAN; CHINA; etc.

Association for the Advancement of Science, American: see SOCIETIES AND ASSOCIATIONS, U.S.

Association of American Geographers: see GEOGRAPHY.

Association of Research Libraries: see SOCIETIES AND ASSOCIATIONS, U.S.: *Research Libraries, The Association of.*

Astronomy. The year 1956 saw the publication of some important astronomical discoveries, the most exciting of these pertaining to developments in the borderline between astronomy and high-energy nuclear physics. Progress in both the theoretical and observational phases of the subject was impressive.

Instrumentation.—The new Flower and Cook observatory at the University of Pennsylvania was dedicated with a symposium devoted to the use of relatively small instruments in astronomy. The Lick observatory's 120-in. reflector neared completion, while the Russians reported building a telescope of similar size in the Crimea. The National Science foundation (U.S.) made a grant of \$279,000 for site testing in Arizona and California for a national optical observatory.

Two new radiotelescopes devoted primarily to 21 cm.-line researches were put into operation. The 60-ft. Harvard telescope was dedicated April 28, while a 25-m. dish had been constructed at Dwingelo, 30 mi. S. of Groningen, Neth.

Much planning had been done for Operation "Moonwatch," the program for the tracking of artificial satellites to be launched during the International Geophysical year, 1957–58.

The Sun.—As the solar cycle advances, the sun shows an increasing level of activity. W. A. Rense at the University of Colorado, Boulder, photographed the solar disk in Lyman α from an Aerobee rocket; a considerably enhanced Lyman α radiation occurs in active spot and plage areas at the time of flight. High-dispersion solar spectrograms obtained at the McMath-Hulbert observatory show complex structure in all but the weakest Fraunhofer lines. They provide a powerful tool for the study of the hydrodynamics of the solar atmosphere and allow an interpretation of spectroheliograms. This problem, however, requires much higher resolution than is available. A new model of the internal structure of the sun calculated by M. Schwarzschild,

R. Howard and R. Härm takes into account the depletion of hydrogen in the solar interior by its conversion to helium. A new analysis of the quantitative chemical composition of the solar atmosphere was undertaken at the University of Michigan, Ann Arbor, by L. Goldberg, E. Müller and L. H. Aller. The solar chemical composition appears to be more nearly representative of our part of the universe than that of the earth's crust or meteorites.

Meteors.—An analysis by F. L. Whipple and L. Jacchia of the accurate orbits of 308 meteors photographed with the super Schmidts showed all these objects to belong to the solar system. More than 90% of them originated from comets.

Venus.—Radio-frequency radiation of thermal origin was observed by C. H. Mayer, R. M. Sloanaker and T. P. McCullough at the Naval Research laboratory. The strata responsible for this radiation must be at a higher temperature than 350° K. J. D. Kraus at Ohio State university, Columbus, observed intense 11 m.-wave-length signals of burstlike nature similar to terrestrial thunderstorm static and also signals of a more sustained and coherent type. The hypothesis of water on Venus, invoked to explain the scattering properties of the cloud particles, was regarded as untenable. It does not explain the colour of the clouds, nor can it seem to account for the absence of water vapour lines in the spectrum of the planet.

Earth's Rotation.—The U.S. Naval observatory initiated a program of comparing the second as defined by the earth's period of rotation with an atomic frequency standard developed by L. Essen and J. V. L. Parry at the National Physical laboratory, Teddington, Eng. It was believed that a change of one part in 10^9 per year in gravitational and atomic time scales relative to each other might be detected by about 1970.

Mars.—In the press the most exciting astronomical event of the year was the close approach of Mars in September. The vast observational material accumulated at this opposition had not yet been described and analyzed late in the year, but systematic watches of the planet from stations widely separated in longitude were maintained. Since the rotation period of Mars is 24 hr. 37 min., a single terrestrial station cannot maintain a survey of the entire planet.

A new interpretation of the dark areas on Mars, proposed by D. B. McLaughlin, explains their shapes as due to deposition patterns of volcanic ash dispersed by monsoon winds. This theory, although it does not adequately explain the changes of colour with the seasons, and seems to indicate that more water should be found on the surface of the planet than actually exists there, explains a number of previously puzzling mysteries of the red planet. The dark areas of Mars with their long-term changes can no longer be held up as "proofs" of vegetation on Mars. The volcanic theory neither supports nor opposes the hypothesis of life on Mars; it does permit an explanation of the dark areas by inorganic causes. Thermal radio-frequency radiation had been observed from Mars.

Pluto.—The suggestion that Pluto is an escaped satellite of Neptune had been made 20 years earlier by Raymond A. Lyttleton in volume 97 (page 108) of the *Monthly Notices* of the Royal Astronomical society. The hypothesis was greatly strengthened by the recent work of Gerard P. Kuiper, who showed how such an escape could occur in the framework of his theory of the origin of the solar system. Thanks to the work of Kuiper, we now have some reasonable ideas on the origin of the solar system, and it is quite evident that Pluto could not have been formed in the same way as Neptune or Uranus.

Crab Nebula.—This strong radio-frequency source, identified with a supernova of 1054, had defied any interpretation in terms of simple thermal radiation. Oort and Walraven published an account of the polarization of the optical radiation from this

object, suggesting that the emission is a synchrotron-type of radiation produced only by high-energy particles in a magnetic field. The possibility that other nonthermal radio sources may owe their radiation to synchrotron emission was being explored.

Red Shift.—At the Naval Research laboratory, A. E. Lilley and E. F. McClain measured the radio-frequency red shift of the 21-cm. absorption line produced in the envelope of neutral hydrogen gas surrounding the high-temperature colliding-galaxy radio source Cygnus A. They showed that to within the limits imposed by the experiment, $\Delta\lambda/\lambda$ is constant over an interval of 500,000 to 1 in the electromagnetic spectrum.

The red shifts of distant galaxies have been determined usually by spectrographic methods. W. A. Baum showed that with a photon counter and a six-colour system it is possible to reach much fainter galaxies. Since the intrinsic energy distributions of the galaxies are independent of their distance, from a change in their observed colour it is possible to get an estimate of the red shift.

Stellar Evolution.—Perhaps the most exciting developments in astronomy are those connected with problems of stellar evolution. Merle F. Walker studied the colour magnitude diagrams of several clusters, finding additional evidence bearing on the problem of star formation. For example, the cluster NGC 6530 possesses a normal main sequence down to about AO; the fainter stars lie above the main sequence. Presumably, they are stars that are yet shining by gravitational contraction and have not yet reached the main sequence. Such clusters contain numbers of T Tauri variables that are presumed to be young stars still in a contracting state. In NGC 2264, stars of spectral classes later than about F8 show an increasing degree of rotation with advancing spectral class, suggesting that these stars are objects in which the original angular momentum of the cloud from which they are formed has not yet been dissipated.

A. J. Deutsch discussed stars at the other end of the life span. The extended atmospheres of M giants, as illustrated convincingly by the displacements of spectral lines in the system of α Herculis, appear to be slowly dissipating into space. This observation is in harmony with theoretical expectations. Some of the main steps in the life history of a star appear to be understood. A star is formed from the interstellar medium, pulls itself together and shines by gravitational contraction until it reaches the main sequence where it shines for the longest part of its productive life by converting hydrogen into helium. Then, after the hydrogen in its core has become exhausted, energy production takes place in a thin shell where hydrogen-rich material is still fed in from the outer parts of the star. The core of the star grows gradually smaller and denser, the outer portions expand until, finally, they are dissipated in space. Thus the star leaves the main sequence and becomes a giant. Eventually, the hot core of the star settles down as a white dwarf; the details of this transition are not yet known, either observationally or theoretically.

Closely connected with the problem of stellar evolution is that of the origin of the elements. In one theory the elements were all presumed to have been formed early in the history of the universe. In another, the heavy elements are presumed to have been formed in the intensely hot cores of aging stars. Important contributions to this problem were made by A. G. W. Cameron (Chalk River, Ont.), the Burbidges, F. Hoyle and W. Fowler working at the Cavendish laboratory in Cambridge, Eng., and at California Institute of Technology. They were able to show that on the assumption the nuclides were produced in hot stellar cores it was possible not only to account for the relative distribution of the various metals in the neighbourhood of iron but their relative isotope abundances as well! The heavier nuclides can be accounted for by neutron capture on a slow time scale, by neutron capture on a fast time scale and by photo-

nuclear reactions on the products of the slow neutron time scale.

(See also NATIONAL GEOGRAPHIC SOCIETY.) (L. H. A.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Earth in Motion* (1936); *Energy From the Sun* (1955); *Exploring the Universe* (1937); *The Moon* (1936); *The Solar Family* (1936).

Athletics: see TRACK AND FIELD SPORTS; etc.

Atlantic Treaty: see NORTH ATLANTIC TREATY ORGANIZATION.

Atomic Energy. The military and the peaceful uses of atomic energy continued their unequal contest for supremacy in 1956. Among the great nuclear powers atoms for war continued to claim a greater share of national treasure than was allotted to atoms for peace. International disarmament made no discernible progress, although the world's rulers agreed that all-out nuclear war would be a catastrophe for the whole race of man. Tests of atomic weapons, both large and small, continued at an increased rate.

But atoms for peace made some notable gains. The long-sought international atomic energy agency was nearing reality, and international co-operation for peacetime exploitation of the atom was developing rapidly.

In May the world's first large nuclear power plant "went critical" in Great Britain. Asia's first atomic reactor began operating in India on Aug. 4, producing radioactive isotopes for research. More and more of the smaller nations were undertaking nuclear research and laying the foundations for peacetime atomic energy industries.

Scientific reports on the effect of atomic radiation on life helped to bring into perspective what is known of this little understood phenomenon and to point out what man must learn and do in order to live with atomic energy.

Atomic Disarmament.—The high hopes born of the conference of the heads of the Big Four Powers at Geneva, Switz., in July 1955 were still unrealized. The U.S.S.R. rejected Pres. Dwight D. Eisenhower's proposal for exchange of military blueprints and international aerial inspection. A five-nation United Nations disarmament subcommittee met in London from March 19 to May 4, 1956, without reaching agreement on a disarmament formula. The UN disarmament commission began a new session in New York on July 2 but adjourned July 16 without resolving the stalemate.

On Sept. 11, 1956, Soviet Premier Nikolai A. Bulganin again put forward the Russian proposal for an unpoliced ban on nuclear weapons tests which was first offered to the world after the giant Soviet thermonuclear explosion of Nov. 1955. But the west's attitude toward the Soviet proposal had been summed up by U.S. Secretary of State John Foster Dulles on Jan. 11 when he said that a sure disarmament plan must be found before such tests could be safely halted. By the end of 1956 no such "sure" plan appeared to be in sight. (See also UNITED NATIONS.)

U.S. Nuclear Tests.—The United States in May, June and July 1956 carried out the biggest test program ever staged at its Eniwetok-Bikini proving ground in the mid-Pacific. No official announcement was made of the total number of explosions, but Japanese scientists recorded ten. The first two, on May 5 and May 21, were witnessed by 15 U.S. newsmen and 17 civil defense officials. The May 5 shot was a "small" device in the kiloton power range. Reporters got the impression, not officially confirmed, that it was a "pygmy H-bomb" equivalent in power to more than 30,000 tons of T.N.T.

The May 21 test was the first U.S. air drop of an H-bomb. The weapon was dropped by a B-52 intercontinental bomber and detonated at an estimated height of 10,000–15,000 ft. Its power, never officially announced, was guessed at about 10,000,000 tons' T.N.T. equivalent. It missed its aiming point over Namu

Island by nearly four miles, but officials ruled the experiment a success.

The U.S. Atomic Energy commission and the department of defense said the 1956 tests helped to develop new defenses against nuclear attack and pointed the way toward perfection of nuclear weapons with "reduced" radioactive fallout.

Assuming ten shots in the 1956 program, the all-time total number of U.S. nuclear explosions now stood at at least 75.

Soviet Tests.—The Russians, after a big test year in 1955, resumed the testing of nuclear weapons in March 1956. They started a new series in April and another in August. The U.S. for the first time reported the general location of the Russian proving grounds. It said the explosions took place at the "usual" site "in southwest Siberia, north of India, Afghanistan and Pakistan, and west of China," and that the Russians also had used "the area of the Barents sea" for nuclear tests.

The first three shots of the series started in August were each less than a megaton (1,000,000 tons' T.N.T. equivalent), according to the U.S. Atomic Energy commission. The Soviet government reported a fourth explosion Sept. 10. It said the new tests were designed to develop tactical atomic weapons "for various kinds of troops." It also said that to reduce fallout Soviet tests usually are carried out "at great heights" with "a minimum quantity of radioactive substances."

British Tests.—Great Britain test-fired two atomic devices in the Monte Bello Islands off Australia, one on May 16, 1956, and another on June 19. This was the third British test series, the first and second having been conducted in 1952 and 1953. It brought the total of British test explosions to five. Then on Sept. 27 the British began a fourth series with an experimental explosion at the Maralinga proving ground in Australia. Four shots in all were scheduled for this series. All the British tests had been of atomic weapons in the kiloton power range. Britain scheduled its first H-bomb test for early 1957 near Christmas Island in the mid-Pacific.

Radiation and Health.—In Washington, D.C., the National Academy of Sciences after a year-long study reported that radiation from any source "is harmful to life." But "with proper safeguards . . . a full-scale, world-wide peaceful atomic energy program should not bring with it undue biological hazards."

The report proposed that records be kept of every person's lifetime exposure to radiation and recommended limits on the amount of radiation reaching the reproductive glands over and above the amounts from natural sources. The limits were: For the whole population, an average of 10 roentgens from conception to age 30; for any individual, no more than 50 roentgens to age 30 and an additional 50 roentgens between the ages of 30 and 40.

The academy said that at present the average U.S. citizen receives in his sex glands about three roentgens in medical and dental X-rays—about 30% of the recommended limit. The report further said that nuclear weapons tests had not raised world-wide radiation to biologically dangerous levels "and will not do so if continued at the same rate as in the past."

The academy noted that when a world-wide atomic power industry becomes fully developed its radioactive wastes may "represent more radiation than would be released in an atomic war." Therefore, means must be found to keep such wastes from doing harm.

The Medical Research council of Great Britain published similar findings at the same time. Both reports expressed concern about radioactive strontium-90, a long-lived fission product which settles uniformly on the planet in a period of years after high-yield nuclear explosions. Ingested in large enough amounts it can cause bone cancer in human beings.

International Agency.—Twelve nations meeting in Washington, D.C., from February through April 1956 reached substantial

agreement on the draft statute for an international atomic energy agency to promote atoms for peace. Such an agency was first proposed by President Eisenhower in a speech to the United Nations on Dec. 8, 1953.

The 12-nation group invited a total of 87 countries to a conference starting Sept. 20, 1956, in New York city, to work out the final text of the statute.

The agency would function as bank and broker for fissionable materials. Such materials, contributed by the atomic "have" powers, would be distributed to "have-not" nations. The draft statute called for "prudent safeguards" to make certain that all atomic materials were used solely for peaceful development of atomic energy.

The New York conference got under way with 81 of the 87 nations represented, and the debate immediately centred on the inspection safeguards demanded by the United States. The U.S.S.R., India and many of the smaller nations contended that the proposed inspection and control provisions would violate the sovereignty of recipient countries.

The United States argued that the safeguards were vital to the peaceful use of atomic energy. It offered, if the international agency adopted them, to apply the inspection-control provisions to the bilateral atomic agreements (grown to 39 by the time of the conference) it had signed with other nations for peaceful use of atomic energy.

Ambassador James J. Wadsworth, affirming U.S. willingness to entrust inspection to the United Nations agency, said the United States wanted the international body to be "the cornerstone of its international activities in the field of atomic energy for peace." Chief supporters of the U.S. view were Great Britain, Canada, Australia and New Zealand.

On Oct. 23 the representatives of all the states present at the conference (82 by this time) voted unanimously to adopt the revised statute for the International Atomic Energy agency. It was hoped that enough nations, a minimum of 18, would ratify the statute to bring it into force by mid-1957.

Other International Co-operation.—President Eisenhower on Feb. 22, 1956, allocated 40,000 kg. (88,000 lb.) of uranium-235 for fuelling research and power reactors at home and abroad. Half was earmarked for distribution among "friendly nations" and half for use chiefly in private power plants in the United States, on a sale or lease basis.

The 40,000 kg. of U²³⁵, worth approximately \$1,000,000,000, would support nuclear power programs with a generating capacity of several million kilowatts. Not all would be distributed in any one year but as needed over the years. This allocation was intended to assure fuel to support atomic power development during the life of civilian licences granted by the Atomic Energy commission in the United States and during the expected life of foreign power projects using U.S. fuel.

In July the U.S. congress appropriated \$5,500,000 to help start construction of research reactors in 25 other countries. Each country would receive a maximum of \$350,000, representing about half the cost of a research reactor. The first grants went to Brazil, Spain, Denmark and the Netherlands.

Bilateral Agreements.—U.S. offers of help, including the allocation of fuel, stimulated bilateral research and power agreements with other countries. By June 30, 1956, the United States had signed 29 research and 7 power agreements. It also was negotiating power agreements with Brazil, India, Italy and Norway and additional research bilateral agreements with Ceylon, Ecuador, Guatemala, Haiti, the Union of South Africa and Yugoslavia.

The United States amended agreements with its World War II atomic partners, Great Britain and Canada, to broaden exchange of both classified and unclassified information on such

things as military package power reactors and atomic propulsion of naval vessels, aircraft, "or land vehicles for military purposes." By June 30 the United States had presented atomic libraries to 42 nations and three international organizations. U.S. business firms had been picked to build nine reactors in other countries.

Regional Atomic Groups.—Ministers of the Organization for European Economic Cooperation set up a steering committee in Paris in July to discuss nuclear co-operation. The United States and Canada were associate members.

Meanwhile the six Euratom countries, Belgium, France, west Germany, Italy, Luxembourg and the Netherlands, worked on a treaty providing for an atomic development pool program. The French national assembly on July 11 approved in principle the proposed pool of atomic resources in Euratom but reserved France's right to develop nuclear weapons. On July 13 the Soviet Union, objecting to the inclusion of west Germany in Euratom, proposed as a substitute an all-European regional body for exchange of information and co-ordination of atomic development programs. The U.S.S.R. and the United States would be members.

The European Organization for Nuclear Research (C.E.R.N.) issued its first annual report on June 1. It conducted an international symposium on high-energy physics in Geneva, June 11-23. Approximately 300 scientists attended, including about 60 from the U.S. and the same number from the U.S.S.R.

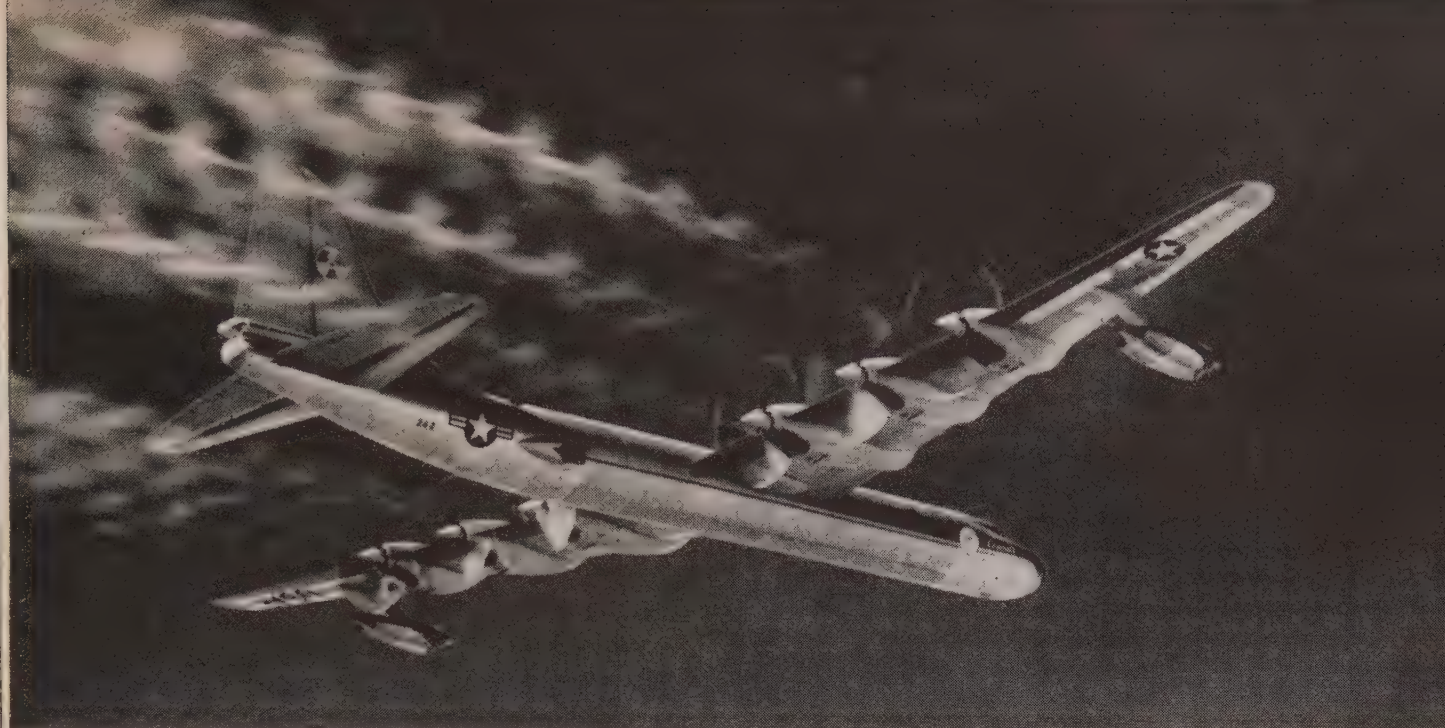
In July at Panamá City President Eisenhower proposed a western hemisphere organization to speed "beneficial use of nuclear forces" in industry and medicine. In March 1956 the Republic of the Philippines was chosen as the site for an Asian nuclear training and research centre to be financed by the United States in behalf of the Colombo powers. Canada was providing a reactor under the Colombo plan which was to begin operating by 1958 at Trombay Island, 13 mi. from Bombay. Meanwhile, India's first atomic reactor went into operation at Trombay on Aug. 4. It would produce radioactive isotopes for research and would be used to train nuclear scientists.

Nuclear Power (British).—On May 22, 1956, the world's first large-scale atomic power plant "went critical"—that is, a self-sustaining nuclear chain reaction began in the plant's uranium "firebox." The plant was Britain's Calder Hall station in Cumberland. Subsequent to its formal opening by Queen Elizabeth II on Oct. 17 the two-reactor plant was expected to achieve a capacity of 92,000 kw.

The United Kingdom Atomic Energy authority reported that as of March 31, 1956, "no fewer than 21 nuclear reactors were either in operation, under construction or planned by the Authority alone." These were in addition to the 12 nuclear power stations (including Calder Hall) embraced in the British government's ten-year program and in addition to a research reactor to be built by a private firm, Associated Electrical Industries.

Nuclear Power (Russian).—The Soviet Union in 1956 announced plans to build five atomic power plants, in Moscow, Leningrad and the Urals. They would range in capacity from 400,000 to 600,000 kw. each and were expected to be in operation by 1960. The U.S.S.R. planned in addition to have several pilot plants of 50,000-kw. capacity each in operation by 1959 or 1960, and was also reported to be planning a 200,000-kw. pilot plant.

Nuclear Power (French, Japanese, German).—A French reactor at Marcoule, north of Avignon, began to produce enough heat to make steam on Sept. 28, 1956. When it reached full power this reactor was expected to generate about 5,000 kw. of electricity, or less than enough to drive its own cooling blowers. The reactor was the first of three to be built at Marcoule. They were designed primarily as plutonium producers. Production of atomic power on an industrial scale was not expected in France before 1959, when a plant in the Loire valley was scheduled for completion. It was designed to have a capacity of 300,000 kw.



NUCLEAR TEST PLANE, a Convair NB-36H, the first aircraft to fly with an operating atomic reactor aboard. Test trials were conducted in 1956. The reactor was not used to power the plane

Atsushi Ohya, vice-chairman of the Japanese Atomic Industrial forum, said on Sept. 27 that his country hoped to be generating nuclear power by 1965. Ohya said Japan was lagging in atomic technology, but by 1965, he said, "we shall require atomic power of at least 450 megawatts," and the requirement by 1970 would be 2,800 megawatts.

West Germany hoped to have 20 nuclear power plants in operation by 1970, an ambitious program, but Franz Joseph Strauss, in charge of the republic's atomic affairs, believed it could be carried out. The goal was 3,000,000 kw. of atom-generated electrical power. Meanwhile, the U.S.S.R. promised to help east Germany to build a 100,000-kw. atomic power station.

Nuclear Power (U.S.).—The first U.S. atomic industrial power plant, the 60,000-kw. plant at Shippingport, Pa., was expected to be generating power by late 1957. Meanwhile, the AEC pushed work on nine reactors of different design as developmental power prototypes. It put into effect nine basic regulations governing civilian applications of atomic energy. It also, on May 4, granted the first construction permits for private power reactors. The permits went to Consolidated Edison company of New York for a \$55,000,000 plant at Indian Point, Peekskill, N.Y., to generate 236,000 kw., and to Commonwealth Edison company of Chicago for a \$45,000,000 plant in Grundy county, Ill., to generate 180,000 kw. Both were scheduled for completion by Oct. 1960. They would be financed entirely by private capital.

In addition, under its Power Reactor Demonstration program, the AEC signed its first contract with an industrial group proposing to build a large power plant with government assistance. The group was the Yankee Atomic Electric company of Boston, which planned a 134,000-kw. plant near Rowe, Mass. The company would pay the \$34,500,000 construction costs and the commission would pay \$5,000,000 research and development costs.

On Aug. 4 the commission granted a "conditional construction permit" for another large plant under the demonstration program. It went to the Power Reactor Development Corp. of Detroit, a nonprofit organization supported by 26 utility and manufacturing corporations, for a 100,000-kw. fast-breeder plant at Lagoona Beach, Monroe county, Mich. The reactor was expected to cost \$10,500,000 and was scheduled for completion between Dec. 15, 1959, and Dec. 15, 1960.

Alaska Reactor.—The Atomic Energy commission in August approved "as a basis for contract negotiations" a proposal by the

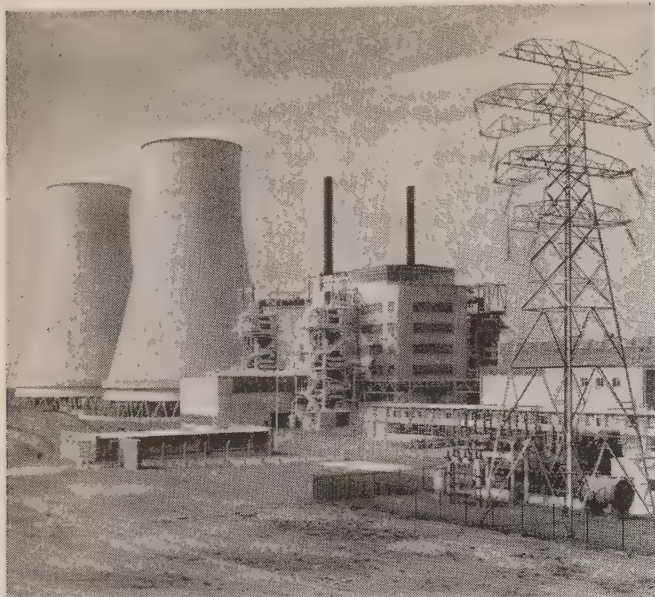
Chugach Electric association of Anchorage, Alaska, and the Nuclear Development Corporation of America to develop a 10,000-kw. demonstration nuclear power plant which would be built near Anchorage. The plant's total cost would be about \$20,000,000, of which the AEC would be asked to furnish \$18,325,000. The reactor would be the first combining heavy water, the best moderator, with liquid sodium, the best coolant. The AEC's approval, first of its kind, was for "limited initial design and development work."

The Chugach proposal was the third on which the AEC had acted under the second round of its Power Reactor Demonstration program promulgated in Sept. 1955. Seven proposals were received under the second round program. The other two approved as a basis of negotiation were proposals of the Rural Co-operative Power association of Elk River, Minn., for a 22,000-kw. boiling water reactor, and of the Wolverine Electric co-operative of Big Rapids, Mich., for a 5,000-10,000-kw. aqueous homogeneous reactor.

Raw Materials.—In the first half of 1956 the United States became the free world's largest producer of uranium—nearly 3,000,000 tons of ore a year, with reserves of more than 30,000,000 tons. The AEC announced that when its present ore-buying program ended in 1962 it would provide a guaranteed market to 1966 for uranium oxide in concentrates. It would pay \$8 a pound for the oxide.

Atomic Aeroplane.—Chairman Lewis L. Strauss of the U.S. Atomic Energy commission disclosed on June 13 that "in January a turbojet (aircraft) engine was for the first time powered exclusively by heat from an experimental reactor operating on the ground at our testing station in Idaho." The AEC earmarked \$99,000,000 in fiscal 1957 for aircraft propulsion work, and the Civil Aeronautics administration forecast that civil aircraft manufacturers would have atomic power plants on their drawing boards "by 1965."

Atomic-Powered Ships.—The Bethlehem Steel company's shipyard at Quincy, Mass., began work in July on an \$88,000,000 nuclear-powered guided missile cruiser. Westinghouse Electric corporation was to build the \$18,300,000 atomic power plant. Rear Adm. Albert G. Mumma, chief of the navy's bureau of ships, said that "by the early 1960s all major combatant naval vessels



CALDER HALL, Great Britain's first atomic power plant and the largest in the world, opened at Cumberland, Eng., in Oct. 1956. The two generating units were expected to produce 92,000 kw. of electricity when the plant was in full operation

authorized for construction are likely to be propelled by nuclear power."

Meanwhile, the atomic submarine "Nautilus" in the 18 months since she put to sea for the first time in Jan. 17, 1955, had logged nearly 50,000 mi. on her original fuel charge. The first fuel core was expected to be good for at least six months more.

President Eisenhower on July 30, 1956, signed a congressional measure authorizing construction of the first U.S. atom-powered merchant ship. It was expected to cost about \$40,000,000. On Sept. 25 Undersecretary of Commerce Louis S. Rothschild said the Maritime commission and AEC hoped to have the atom-powered merchant ship in operation before the end of 1959. He said it would be powered by "the most advanced type of pressurized water atomic reactor" and would have a service speed of 21 knots, carry about 100 passengers and have capacity for 12,000 tons of cargo. It was reported that Norway, west Germany and Great Britain were also working on projects for nuclear propulsion of merchant ships.

The U.S.S.R. reported progress toward completion of an atom-powered icebreaker, and was also considering construction of a nuclear-powered whaling ship. The icebreaker was described as a 16,000-ton, 428-ft. craft which would consume no more than five ounces of fuel a day and could operate without refuelling for about three years. Moscow radio said it would be able to break through the heaviest ice and reach the north pole.

Hydrogen Power.—The United States, the Soviet Union and Great Britain continued long-range research in the hope some day of harnessing the H-bomb's fusion reaction for industrial power. None claimed any major breakthroughs. Amasa Bishop, chief of the U.S. project, said in June that with fusion there exists "the possibility of direct generation of electrical power without the necessity of going through a heat cycle, which is both costly and inefficient." This is because much of the energy released in fusion is in the form of charged particles. At the high temperatures involved, of the order of hundreds of millions of degrees, the reaction could be contained only by an electromagnetic field. Interaction of the charged particles with this field could "result in the direct generation of electrical power."

Atoms for Rockets.—The AEC's Los Alamos laboratory revealed Sept. 9, 1956, for the first time that it was engaged in "research and development of nuclear rocket propulsion." In

theory a small fission reactor might be used in a rocket as a substitute for combustion of chemical fuels. The reactor would heat a light gas (preferably hydrogen) which would be expelled at high velocity, thus propelling the rocket in the opposite direction.

Access Permits.—The Atomic Energy commission in June issued 67 "access permits" entitling holders to receive classified atomic information of industrial interest. This brought the total issued under the access permit program to 912. The AEC said it had sold about 11,000 confidential and 2,000 secret reports to permit holders.

The commission also issued rules under which it would provide secret restricted data on fusion processes to persons involved in "substantial" efforts to produce fission power.

Food Irradiation.—The Atomic Energy commission in July 1956 invited bids on a \$3,000,000 food irradiation reactor it would build for the army quartermaster corps. On Sept. 25 the AEC announced that it had received proposals from 11 industrial firms. The quartermaster corps had been conducting experiments to determine whether foods sterilized by radiation would be non-toxic, acceptable to consumers in terms of appearance and taste, and economically competitive with foods preserved by other means. The new reactor, to be moderated with water and powered with solid fuel elements, would provide a large-scale gamma radiation source for the experimental program.

Isotopes.—In the ten years through May 31, 1956, the Atomic Energy commission made 82,688 shipments of radioactive isotopes to industrial, medical and research users. Of this total, 4,334 shipments went to foreign countries. In the United States 1,200 industrial firms were using these so-called tracer materials possessing radioactive "tags." The AEC said annual savings from their industrial use amounted to about \$100,000,000 and would increase tenfold during the next ten years.

Newest Reactor Concept.—The commission disclosed that it had started a program to develop reactors fuelled by a mixture of uranium and plutonium. So far no one had succeeded in safely harnessing the energy of highly poisonous plutonium for nuclear power. The uranium-plutonium project brought to nine the number of experimental power reactor designs on which the AEC was working. The others were pressurized water, boiling water, sodium-graphite, aqueous homogeneous, fast breeder, liquid metal-fuelled, organic-moderated and closed-cycle gas-cooled.

(See also BUDGET, NATIONAL; PHYSICS; PUBLIC HEALTH ENGINEERING; UNITED NATIONS; URANIUM.)

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ENCYCLOPÆDIA BRITANNICA FILMS.—*Atom and Agriculture* (1953); *Atom and Biological Sciences* (1953); *Atom and Industry* (1952); *Atom and Medicine* (1952); *Atom Smashers* (1953); *Atomic Energy* (1947); *Atomic Radiation* (1953); *Carbon Fourteen* (1953).

Audio-visual Education: see MOTION PICTURES.

Australia, Commonwealth of. Australia is a realm of the Commonwealth of Nations, situated in the southern hemisphere. Federal capital: Canberra. Areas and populations of the federated states, Northern Territory and Australian Capital Territory are given in the table. Apart from the larger state capitals there was only one city (metropolitan population) of more than 100,000 in 1954: Newcastle, N.S.W., 178,156. Territories under the administration of the Commonwealth of Australia but not included in it comprise Papua and the trust territory of New Guinea (see PAPUA-NEW GUINEA; TRUST TERRITORIES), Norfolk Island (13

sq.mi.; pop. [1954 census] 942), the island trust territory of Nauru (8 sq.mi.; pop. [1954 census] 3,473), Ashmore and Cartier Islands, Heard and Macdonald Islands (159 sq.mi.), Cocos (Keeling) Islands (5 sq.mi., pop. [1955 est.] 1,000) and the Australian antarctic territory (2,472,000 sq.mi.). Language: English. Religion (1954 census): Anglican 3,408,850; Roman Catholic 2,061,986; Methodist 977,933; Presbyterian 869,242; Baptist 127,444; Lutheran 116,178; Church of Christ 80,344; Greek Orthodox 74,760; Congregational 69,452; other Christian 247,485; Jewish 48,439; other non-Christian 6,378; indefinite and no religion 42,140; no reply 855,898. Queen, Elizabeth II; governor general in 1956, Field Marshal Sir William Slim; prime minister, Robert Gordon Menzies.

State or territory	Capital (with metropolitan pop. 1954 census)	Area (in sq.mi.)	Population (1947 census)	(1954 census)
New South Wales	Sydney (1,863,161)	309,433	2,984,838	3,423,529
Victoria	Melbourne (1,524,111)	87,884	2,054,701	2,452,341
Queensland	Brisbane (502,353)	670,500	1,106,415	1,318,258
South Australia	Adelaide (483,508)	380,070	646,073	797,094
Western Australia	Perth (371,442*)	975,920	502,480	639,771
Tasmania	Hobart (95,206)	26,215	257,078	308,752
Northern Territory	Darwin (8,071)	523,620	10,868	16,452
Australian Capital Territory	Canberra (28,277)	939‡	16,905	30,315
Totals		2,974,581	7,579,358	8,986,529§

*Including Fremantle. †Including 28 sq.mi. at Jervis Bay (federal port, 90 mi. E.N.E. of Canberra). ‡Excluding full-blooded aborigines: (1947 census) 46,638; but including half-caste (1954 census) 27,179. §1955 est. 9,201,000.

History.—As regards internal politics, 1956 was a quiet year with the Liberal-Country party government supported by a record majority of 27 in the house of representatives. There was still dissension within the Labour party, despite the near elimination in the Dec. 1955 elections of the Catholic Action break-away group, and it did not offer spirited opposition.

In the senate, two Catholic Action or anticommunist labour senators held the balance of power from July 1 when newly elected senators entered parliament. Senate strengths were Liberal-Country party 28; Labour 28; anticommunist Labour 2. The anticommunist senators did not oppose government legislation, but Liberal leaders warned publicly there might be a *rapprochement* between the Labour party and the two break-away senators when a suitable opportunity arose to force an issue in the senate which would bring about a federal general election.

The eclipse of the anticommunist Labour party continued at the polls. Of 14 candidates in the Tasmanian state election in October, 11 lost their deposits. None won a seat. In the federal by-election for Barker the same month, the anticommunist candidate also lost his deposit. Despite continuing dissension within the party, state elections and the Barker by-election later in the year showed a slight swing toward official Labour. In March the New South Wales Labour government had dropped seven seats in the state elections and was returned to power with a narrow majority. A South Australian election the same day returned a Liberal government to power with party strengths unchanged. In April, however, following a federal supplementary budget increasing taxation, the Labour government in Western Australia increased its majority by three. In Queensland in May, the Labour government retained its majority of 23, and strengths also remained unchanged in Tasmania in an October election, with Labour continuing to hold office. At the resultant by-election for the Barker seat, the Liberal candidate was successful but with a majority of 5,000 less than in the previous December.

Inflationary pressures were again evident in 1956. On June 30 the retail price index was 6% higher than in the previous year. The basic wage, where tied to the retail price index, rose to 13 gs. per week in November, as compared with £12 5s. in June 1955. Advances for instalment purchases stood at £209,300,000 in June 30, 1956, as compared with £181,300,000 the previous

June, an increase of 14%. The government and trading banks, to ease inflationary pressure, adopted what the federal treasurer, Sir Arthur Fadden, described as a "policy of restraint." In March the prime minister, R. G. Menzies, introduced a supplementary budget, levying increased taxes on cars, motor fuel, liquor, cigarettes, tobacco and other "luxury" items. Customs and excise duties were also increased, and the bank overdraft interest rate raised to 6%. Menzies told parliament that without the program inflationary factors in the economy would end Australia's present high measure of prosperity and give the government a budget deficit of at least £30,000,000 for 1955-56. Following the supplementary budget, the treasurer announced in July a surplus of £61,300,000 for 1955-56, and in August he budgeted for a £108,700,000 surplus for 1956-57.

There were two anti-inflation conferences of premiers in Canberra during 1956; both ended in disagreement. The federal government sponsored the conferences in an endeavour to reach a uniform wage policy. In Sept. 1953 the commonwealth arbitration court had suspended quarterly cost-of-living adjustments of the basic wage for all members of commonwealth unions, but some state governments had continued to grant these adjustments to members of state unions. This led to an increasing disparity between federal and state basic wages. At a conference in August, the federal treasurer, Sir Arthur Fadden, sought agreement from all state premiers to the abolition of the quarterly cost-of-living adjustment. This the Victorian and New South Wales premiers refused unless the federal government reduced its spending and took other anti-inflationary measures they advocated. A similar conference in November also ended in stalemate. By the end of 1956, however, all states except New South Wales had suspended quarterly cost-of-living adjustments.

Despite more import restrictions, Australia ended the financial year with a visible overseas trade deficit of £46,800,000. The total deficit, including invisibles, was £221,500,000. On June 28 the government announced the halving of imports of fully assembled cars and a 30% cut in the import of unassembled chassis. Carpets, whisky, cigarettes and tinned "luxury" foods were other items affected. With heavy exports in October and improving prices for wool, Australia had a visible overseas trade surplus of £39,500,000 for the first four months of the financial year 1956-57. This was an £80,000,000 improvement on the position at the same time in the previous financial year.

Australia became the biggest single borrower from the International Bank for Reconstruction and Development when it was announced on Dec. 5 that the bank had approved a new loan of \$50,000,000 to Australia. This brought Australia's total borrowing from the bank to \$317,730,000.

Although Australia's planned migrant intake for 1955-56 was 125,000, there were actually 133,000 arrivals. A slight target reduction to 115,000 for 1956-57 was announced in August.

In the federal budget in August, the defense vote of £190,000,000 for 1956-57 was the same as the previous year. However, the division between the services showed substantial alteration, the estimates for the army and navy being reduced, and those for the air force and defense production being increased.

Between Sept. 27 and Oct. 21 the British ministry of supply carried out four experimental atomic explosions at Maralinga, South Australia. One was an atomic weapon dropped from a R.A.F. Valiant bomber.

After seven years of preparation the Olympic games were opened by the duke of Edinburgh in Melbourne on Nov. 22 and ended on Dec. 8.

Other events of importance during the year were the discovery of a great deposit of bauxite in the Cape York peninsula (the field was said to cover an area of 2,000 sq.mi. and to be 9 ft. deep), and the exceptionally severe floods which affected the

states of New South Wales, Victoria, Queensland and South Australia during July and August. A number of rivers, including the Murray, the Darling, the Burdekin and the Lachlan overflowed their banks, flooding great areas of farm and grazing land and causing damage estimated at many millions of pounds.

(See also UNITED NATIONS.)

(R. R. Mv.; X.)

Education.—Schools (1953): government (including primary, secondary, junior technical) 7,595, pupils 1,149,915, teachers 40,237; private (all types) 1,958, pupils 366,086, teachers 13,898; vocational (1951) 146, students 159,310, teachers 6,784. Teacher-training colleges 15, students (1953) 7,141. Universities (1955-56): 10, students (including part-time) 23,925.

Finance and Banking.—Monetary unit: Australian pound, with an exchange rate of £A1.25=£1 sterling and £A0.45=U.S.\$1. Budget: (1955-56) revenue £A1,130,700,000, expenditure £A1,069,000,000; (1956-57 est.) revenue £A1,230,200,000, expenditure £A1,121,400,000. Total public debt: (June 1955) £A3,749,444,000, of which £351,019,000 to U.K. Currency circulation: (Jan. 1955) £A292,000,000; (Jan. 1956) £A335,000,000. Deposit money: (Jan. 1955) £A1,261,000,000; (Jan. 1956) £A1,252,000,000. Gold and foreign exchange holdings: (Dec. 1954) U.S.\$1,133,000,000; (Dec. 1955) U.S.\$835,000,000.

Foreign Trade.—(1955) Imports £A863,000,000, exports £A782,500,000. Main sources of imports: U.K. 44%; other sterling area 13%; U.S. and Canada 15%; continental E.P.U. (European Payments Union) countries 14%; Japan 3%. Main destinations of exports: U.K. 35%; other sterling area 18%; France 9%; other continental E.P.U. 13%; U.S. and Canada 8%; Japan 9%. Main exports: wool 45%; wheat 8%; butter 4%.

Transport and Communications.—Roads (June 1954) 839,600 km. Licensed motor vehicles (Oct. 1955): passenger 1,392,000; commercial 657,000. Railways (1954) 43,780 km.; freight (1954-55) 11,928,000,000 ton-km. Shipping (July 1955): merchant vessels of 100 gross tons and over 374; total tonnage 612,430. Air transport (1955): 1,780,488,000 passenger-km.; freight 81,756,000 ton-km. Telephones (Jan. 1955) 1,530,680. Licensed radio sets (June 1955) 2,034,676.

Agriculture.—Production (metric tons, 1955; 1954 in parentheses): wheat 5,323,000 (4,534,000); oats 726,000 (590,000); barley 828,000 (646,000); maize 91,000 (131,000); potatoes 376,000 (364,000); rye (10,000); apples (1953) 238,000, (1952) 176,000. Wool production (metric tons, clean basis 359,000 (327,000)). Food production (metric tons, 1955): milk 6,372,000; butter 190,800; cheese 45,600; beef and veal 757,200; pork 98,400; mutton and lamb 390,000; sugar, raw value 1,204,000. Wine production (1954) 1,150,000 hectolitres. Livestock (Sept. 1955): sheep 130,849,000, cattle 15,836,000, horses 803,000, pigs 1,297,000.

Industry.—Fuel and power (1955): coal 19,584,000 metric tons; lignite 10,272,000 metric tons; manufactured gas (year ended June) 1,226,400,000 cu.m.; electricity 16,104,000,000 kw.hr. Production (metric tons, 1955): pig iron (year ended May) 1,896,000; crude steel (year ended May) 2,244,000; zinc (smelter) 102,360; copper (smelter) 40,320; refined lead 228,000; tin (smelter) 2,040; cement (year ended June) 1,960,800; cotton yarn (year ended June) 15,840; wool yarn (year ended June) 19,320; gold 1,049,000 fine oz.; tin concentrates (Sn content, 1954) 2,108 metric tons. New houses and flats completed (1955) 80,355.

ENCYCLOPÆDIA BRITANNICA FILMS.—*Australia* (1948); *Bushland Symphony* (1955).

Austria. A republic of central Europe, Austria is bounded north by Germany and Czechoslovakia, east by Hungary, south by Yugoslavia and Italy and west by Switzerland. Area: 32,374 sq.mi. Pop.: (1951 census) 6,933,905; (1955 est.) 6,974,000. Language: German 98%, others 2% (mainly Slovene in Carinthia). Religion (1951): Roman Catholic 89.3%; Protestant 6.2%; Jewish 0.16%; most of the remainder professed no religion at all. Principal towns (pop., 1951 census): Vienna (cap.) 1,766,102; Graz 226,453; Linz 184,685; Salzburg 102,927; Innsbruck 95,055; Klagenfurt 62,782. President in 1956, Theodor Körner; chancellor, Julius Raab.

History.—Serious differences between the two coalition parties, the People's Catholic party (Conservatives) and the Social Democratic party (Socialists), led to the dissolution of the *Nationalrat* (parliament) and the subsequent holding of a general election on May 13, 1956. The People's party obtained 82 seats (gaining eight) and the Socialists won 74 seats (gaining one). The People's party majority over the Socialists increased from one to eight. The Communists were reduced from four to three and the neo-Nazis (newly formed Freedom party) from fourteen to six. The two main parties were strengthened at the expense of the two extremes, but the Conservatives to a greater degree than the Socialists. The most alarming decline for the latter was in Vienna, their traditional stronghold, where their number of votes fell from 590,290 in 1953 to 562,618 in 1956, as compared with a corresponding gain by the People's party whose votes rose from 362,119 to 406,631.



ESCAPING THE HEAT, thousands of bathers from Vienna, Aus., crowded into pools and rivers during the summer of 1956

It had spoken well for the political skill of the Austrian people that the coalition continued after the departure of the occupation forces. But as the result of the 1956 election the Socialists had to accept a certain reduction of their power in the government. Certain nationalized industries such as the huge Linz steel works, which had previously been under the control of the Socialist-administered ministry of transport and nationalized undertakings, were formed into a public company whose board of directors consisted of three Socialist and three Conservative cabinet ministers, the latter including the chancellor. A second group of semistate undertakings, namely those controlled by the big nationalized banks, remained under the non-party minister of finance, Reinhard Kamitz. All official and semi-official posts continued to be divided between the coalition partners according to the rules of "proportion"—in relation to the voting strength of the respective parties at the general election.

Neutrality was the keynote in foreign policy though there was never any doubt that Austria considered itself as part of the western world. The events in Hungary in October and November provided the first serious test and, with Soviet armour 30 mi. east of Vienna, brought home to the Austrians the dangers inherent in their geographical position. The U.S.S.R. claimed that arms and "Fascist" agents had been imported into Hungary over the Austrian frontier but this was denied by the Austrian government.

The exact interpretation to be put on the nature of Austrian neutrality remained subject to controversy. Both coalition parties approved of Austria's joining the Council of Europe although Switzerland was not represented in it. The Swiss example was studied with particular care in connection with the organization of the new army. The cadres of the army were ready when the occupation forces left. They had been trained in the western zones under the code name "Gendarmerie B" and were subject to the supervision of the Socialist minister of the interior, Oskar Helmer. The state secretary of this ministry, Ferdinand Graf, a Conservative, was on June 22 appointed head of the new ministry of defense and given a Socialist state secretary, Karl Stefani. Medical examinations were begun in May and the first conscripts were called to the colours in October. The army was to be kept at a strength of approximately 30,000 but armament was poor, consisting largely of out-of-

date equipment left behind by the United States and the U.S.S.R.

A mixed commission in Munich made good progress in dealing with economic differences that had arisen between Austria and the German Federal Republic as a result of the Austrian state treaty of 1955. From Oct. 22 to 24, 1956, Chancellor Raab visited Bonn and had friendly discussions with Chancellor Konrad Adenauer and other German ministers. Relations with Italy were darkened by what was claimed to be forcible Italianization of the Austrian minority in Italy's northern province of Alto Adige. This problem, which had cropped up from time to time since 1918, gave rise to some outbreaks of nationalism in Austria which seemed to find little response among the mass of the people.

On the eve of the Hungarian drama the country seemed more contented than at any other time since 1914. The Institute of Economic Research reported in April that during 1955 there had been a 14% rise in national income. Iron and steel production had trebled since 1938. Building activity had increased by 13% since 1954 and tourist traffic by 16%. The number of licensed motor vehicles rose from 530,000 in April 1955 to 650,000 in April 1956. Traffic congestion on a scale comparable with that of western European capitals was noticeable in Vienna, particularly during the September international fair where Austria's position at the crossroads between east and west was epitomized by large exhibits from the United States, China and the Soviet Union.

At the end of the year, the Southeast railway's modern-style station in Vienna was nearing completion and work proceeded apace on the Salzburg-Vienna motor road. The first of a series of huge power stations on the Danube was begun at Persenbeug in Lower Austria.

The rebuilt Vienna opera house experienced a period of crisis which culminated in the resignation of its director, Karl Boehm. As a result the office was divided into an administrative section and a musical section, with Herbert von Karajan appointed to the latter.

(V. T. E.)

Education.—Schools (1954): primary 5,222, pupils 780,835, teachers 7,250; secondary 176, pupils 77,022, teachers 4,485; vocational (excluding compulsory part-time) 174, pupils 37,822; teacher-training colleges 3, students 4,744. Institutions of higher education (1954) 14, students 19,954, teaching staff 2,391.

Finance and Banking.—Monetary unit: schilling, exchange rate 26 to the U.S. dollar. Budget (1955 actual; 1956 est. in parentheses): revenue 27,700,000,000 schillings (26,035,000,000 schillings); expenditure 26,800,000,000 schillings (28,208,000,000 schillings). Internal debt (1953) 11,183,300,000 schillings; external debt 2,052,300,000 schillings. Gold and foreign exchange holdings, central bank (March 1955) U.S.\$359,000,000; (March 1956) U.S.\$345,000,000. Currency circulation (Jan. 1955; Jan. 1956 in parentheses) 11,900,000,000 schillings (12,860,000,000 schillings). Deposit money (Jan. 1955; Jan. 1956 in parentheses) 15,980,000,000 schillings (15,360,000,000 schillings).

Foreign Trade.—(1955) Imports 23,068,000,000 schillings; exports 18,009,000,000 schillings. Main destination of exports: Germany 25%; Italy 14%; other continental E.P.U. (European Payments Union) countries 5%; U.S. and Canada 5%; sterling area 9%; U.K. 4%. Main sources of imports: Germany 35%; Italy 8%; other continental E.P.U. 19%; U.S. and Canada 12%; sterling area 9%; U.K. 5%.

Transport and Communications.—Roads (1955) 30,722 km. Motor vehicles in use (end Oct. 1954): passenger 89,035; commercial 53,817. Federal railways (1954) 6,026 km.; 5,179,325 passenger-km.; freight 6,049,000 ton-km. Telephones (Jan. 1955) 479,386. Licensed radio receiving sets (1954) 1,683,270.

Agriculture.—Production (metric tons, 1955; 1954 in parentheses): wheat 1,900 (452,000); barley 346,000 (312,000); oats 364,000 (334,000); rye 416,000 (370,000); maize 152,000 (149,000); beet sugar (raw) 190,000 (215,000); potatoes 3,005,000 (2,792,000); wine (hectolitres 1954) 370,000. Livestock (1955): cattle 2,346,479; sheep 254,570; pigs 2,933,633; horses 235,614; mules and asses 1,000; goats 256,078.

Industry.—Fuel and power (1955): coal 175,200 metric tons; lignite 588,000 metric tons; electricity (excluding industrial generation) 8,388,000,000 kw.hr.; manufactured gas (Vienna only) 345,600,000 cu.m.; natural gas 748,452,000 cu.m.; crude oil 3,664,992 metric tons. Production (metric tons, 1955): iron ore, 30% metal content, 2,844,000; pig iron 1,82,296; crude steel 1,822,956; magnesite 991,728; aluminium 67,848; copper (electrolytic) 10,320; cement 1,858,596; paper 401,340; nitrogenous fertilizers (N content, June 1954-55) 107,800; cotton yarn 23,160; woven cotton fabrics 15,120; wool yarn 11,520; rayon staple fibre 39,600; softwood (1954) 3,758,000 cu.m.; sawn hardwood (1954) 123,000 cu.m.

Autobiography: see AMERICAN LITERATURE; etc.

Automation: see ELECTRONICS; TELEGRAPHY.

Automobile Accidents: see ACCIDENTS.

Automobile Industry. The year 1956, which marked the 60th anniversary of the start of the automobile industry in the United States, was the industry's biggest expansion year, as capital expenditures increased 68% over those of 1955. The 1956 expansion program included the following major expenditures: General Motors corporation, more than \$1,000,000,000; Ford Motor company, \$592,000,000; and Chrysler corporation, \$150,000,000. Other expansion was evidenced as G.M.'s new Technical centre—a 330-ac., 25-building site near Detroit—was dedicated May 15-16, 1956. In mid-June, the Ford Motor company broke ground for a multimillion-dollar research and engineering centre at Dearborn, Mich.

All-in-all, 1956 could be termed a "good year" for production. The impetus to sales by the introduction of 1957 models in October and November of 1956 was expected to put 1956 over the 6,000,000 mark. The industry marked an exceptionally good first half as 3,191,706 cars were built from January to June, a record topped only by the first six months of 1953 and 1955. The "big three," General Motors, Ford and Chrysler, had 96.25% of the total first half output compared with 94.68% in the first half of 1955.

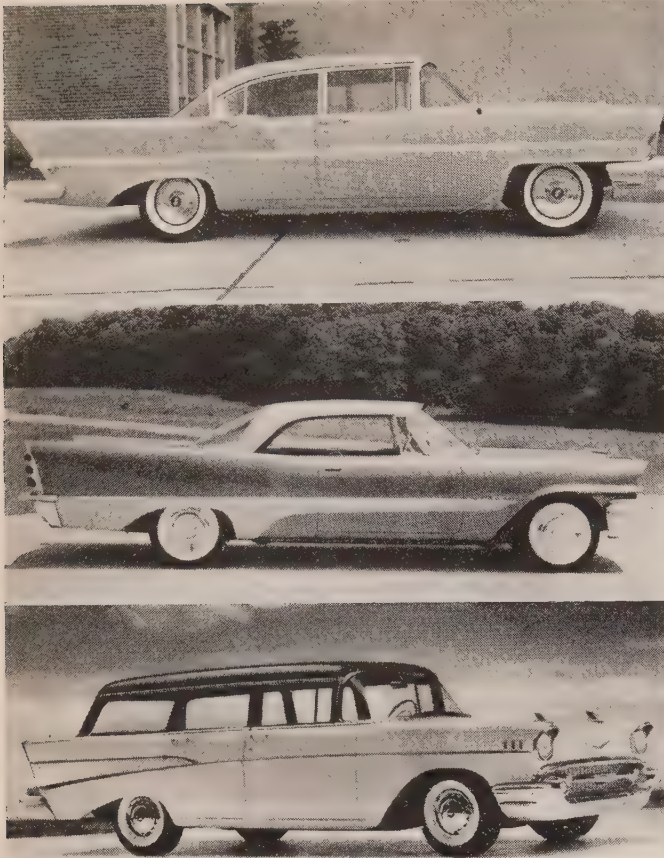
Truck production of about 1,150,000 units was estimated for 1956 as heavy-duty truck output increased about 62% over 1955. The truck-trailer production in 1956 topped all previous years with a final total of about 75,000 units.

The year 1956 saw many changes within the industry as Kaiser and Willys motors dropped out of the passenger car business to concentrate entirely on utility vehicles, Willys becoming a wholly owned subsidiary of the Kaiser Motors corporation. The Studebaker-Packard corporation offered the Clipper as a completely separate line, and Ford introduced the Continental Mark II, a new prestige car in the \$10,000 price class. The Continental was a two-door hardtop coupé with a hood that extended back almost one-third of the over-all car length of 18 ft. Components of the car were subjected to stringent quality checks before, during and after assembly; and each unit was road tested before it was shipped from the factory in a fleece-lined canvas and plastic covering. The exclusive control of the Ford Motor company by the Ford family came to an end at the beginning of the year, when the Ford foundation sold 10,200,000 shares of common stock to the public.

The biggest change occurred at the end of July when



DISPLAY AREA of the General Motors corporation Technical centre at Warren, Mich., dedicated in May 1956



Top, left: 1957 LINCOLN four-door sedan
 Top, right: 1957 FORD four-door Victoria sedan
 Centre, left: 1957 DE SOTO Fireflite two-door hardtop
 Centre, right: 1957 IMPERIAL Southampton four-door hardtop
 Bottom, left: 1957 CHEVROLET Bel Air station wagon
 Bottom, right: 1957 NASH Country Club two-door sedan

Studebaker-Packard corporation, Curtiss-Wright corporation and Daimler-Benz A. G. of west Germany came to an agreement whereby Curtiss-Wright, an aviation company formed in 1929, paid Studebaker-Packard \$35,000,000 for long-term leases on its plants at Utica, Mich., and South Bend, Ind., and for the outright purchase of Studebaker-Packard's Aerophysics Development corporation in Santa Barbara, Calif. All three plants thereafter operated as wholly-owned Curtiss-Wright subsidiaries, but Studebaker-Packard continued to function as a separate entity with its own board of directors and officers. Under the agreement, all Studebaker-Packard automotive manufacturing was to be concentrated at South Bend with the company operating in selected diversified areas of the automotive field instead of competing with the rest of the auto industry in all price classes. The over-all program provided for an option to Curtiss-Wright to buy 5,000,000 of unissued Studebaker-Packard stock for \$5 a share during the first two years of the three-year "advisory management" contract. Daimler-Benz, with a huge automotive plant at Stuttgart, Ger., was to supply Curtiss-Wright with important developments in the diesel and gasoline engine fields.

Dealer Relations.—The soaring auto market brought to a head many problems in the retailing of automobiles to the public. Dealers complained of factory pressure as cars poured from the production lines and competition became keen. Only a 1.7% profit of sales before taxes had been realized by dealers in 1955 as they cut prices and engaged in heavy advertising. During the first quarter of 1956 dealer profits were only 0.8%, compared with 3.1% during the same period in 1955.

Nearly 40 legislative measures were introduced during the 84th session of congress concerning factory-dealer relations. One,

the O'Mahoney-Celler "day-in-court" bill, passed and was signed by Pres. Dwight D. Eisenhower on Aug. 8, 1956. The law permits the nation's 40,000 dealers to bring damage suits in federal courts against manufacturers who fail to act in "good faith" in complying with the terms of dealer franchise agreements, or in terminating or not renewing the franchises.

The senate judiciary antitrust and monopoly subcommittee, headed by Joseph C. O'Mahoney (Dem., Wyo.), held hearings from Nov. 8 through Dec. 9, 1955, on the concentration of power in the auto industry. Facts were sought to help congress pass laws to "stabilize the relationship" between dealers and their factories. On Jan. 19, 1956, a senate interstate commerce subcommittee with A. S. Monroney (Dem., Okla.) as chairman began open hearings on complaints that had been aired by car dealers at the O'Mahoney hearings to the effect that their franchises were one-sided in favour of the factory. Dealers complained about phantom freight (freight charges that did not accurately reflect the transportation costs of the car from the factory to the showroom), bootlegging (the wholesale selling by dealers of new cars to used car lots) and unsound financing.

These hearings prompted the industry to review the whole structure of dealer relations and as a result, late in 1955, General Motors changed the duration of its contracts with dealers from one year to five years, giving dealers more long-term security. Then on March 1, 1956, General Motors announced broad changes in its dealer selling contracts including: (1) the assumption by G.M. of full cost of warranty adjustments; (2) larger allowances on all new cars of the preceding model year remaining in stock when a new model is announced; (3) assistance and substantial protection for the dealer with respect to disposal of his premises and leaseholds in the event of termination; and (4) inclusion of a detailed provision for evaluating dealer sales performance based on all factors, including local conditions.

Ford and Chrysler subsequently granted 100% warranty protection to their dealers. The "big three" took steps to kill phantom freight by realigning their destination charges to certain outlying areas, and named vice-presidents in charge of dealer relations to give dealers a direct channel of communication with top auto management.

Employment.—The longest strike in North American automobile history, a 148-day walkout at five General Motors of Canada plants, ended in mid-February for 17,000 United Automobile workers (U.A.W.) members. The settlement, which was to run to Aug. 1, 1958, was similar to the U.S. auto contracts negotiated in 1955, providing for supplemental unemployment pay, three annual hourly wage increases of six cents, improved pension and insurance benefits, adjustments in wage inequities and extra pay hikes for skilled workers. This package was valued at about 25 cents an hour. The strike had begun when 1956 model change-over operations were only partly completed and was estimated to have cost the workers \$26,000,000 and the company the production of 60,000 cars.

The week of June 4, 1956, marked the 20th anniversary of the U.A.W. union. As of that time, 17 states had approved the integration of supplemental unemployment benefits with state unemployment plans. Contracts won by the C.I.O. auto workers in 1955 required that there must be "integration" of state and company plans in states employing at least two-thirds of the firms' workers. Ohio, Virginia and Indiana turned down the integration that would permit a worker to collect both state and private unemployment pay. Five affected states had not decided either way.

At the end of June, a laid-off Detroit worker became the first person ever to draw a supplemental unemployment benefit payment. It was only \$13.93, but it increased by 40% the \$33 he drew weekly in Michigan unemployment compensation. There was enough money built up in the supplemental unemployment benefits funds—to which car companies had been contributing at the rate of five cents per hour worked by each employee—to provide four weeks of benefits to qualified workers unemployed because of the production slack-off that occurred in June.

Engineering.—Horsepower ratings continued spiraling upward as two makers pushed the power plants in their luxury production models beyond 300 h.p., Cadillac to 305 h.p. and Packard to 310 h.p. All other cars boasted of a 200-or-higher horsepower rating for at least one of their eight-cylinder engines. The Rambler's six-cylinder rating jumped from 90 h.p. in 1955 to 120 h.p. in 1956. The biggest numerical jumps were shown by Lincoln which went to 285 h.p. from 225 and DeSoto to 255 from 200. The average horsepower on 1956 models was 206.2 compared with 173.1 in 1955. The average compression ratio rose from 7.96 to 8.46, with Packard the highest at 10.0 to 1. The lowest ratio offered in 1956 was 7.44 to 1. All passenger car engines, including the sixes, adopted the 12-volt electrical system.

Improvements were made in three of the industry's automatic transmissions. Hydra-Matic got a new fluid coupling to provide smoother shifting; Buick added another stator to its Dynaflo torque converter to improve performance; the direct drive at cruising speed

was eliminated from the Studebaker Flightomatic in favour of a torque converter drive that operates at all times.

The Firebird II, General Motors' second experimental gas turbine car, was shown publicly for the first time in Jan. 1956. Greater efficiency and economy in this new gas turbine engine come from a regenerator or heat exchanger which recaptures more than 80% of the exhaust heat and uses it to preheat the incoming air. Road tests showed that the heat exchanger reduces fuel consumption at least 50% and also helps improve low-speed performance. On March 30 a 1956 Plymouth sedan powered with a regenerative gas turbine engine completed a four-day coast-to-

Table I.—World Motor Vehicle Production in 1955

Area	Passenger cars	Trucks	Buses	Total
United States	7,920,186	1,245,083	4,023	9,169,292
Canada	374,945	78,882	355	454,182
Subtotal	8,295,131	1,323,965	4,378	9,623,474
Australia	45,423	16,465	..	61,888
Austria	11,112	6,456	512	18,080
Belgium . . . . .	..	1,257*	368	1,625
Czechoslovakia . . . . .	..	..	..	25,000
Denmark . . . . .	..	..	..	..
Finland . . . . .	..	..	..	..
France	561,465	160,628	2,968	725,061
Germany, east	24,000	17,000	..	51,000
Germany, west	762,205	140,529	6,008	908,742
Hungary . . . . .	..	..	..	1,350
India†	8,541	11,169	..	19,710
Italy	230,833	35,071§	2,852	268,756
Japan	13,354	129,832	4,807	147,993
Netherlands	14,872	4,663	591	20,126
Poland	4,100	10,400	..	14,500
Spain¶	3,972	..	..	3,972
Sweden	33,140	15,377	1,782	50,299
Switzerland	0	554	129	683
U.S.S.R.¶	106,000	329,000	10,300	445,300
United Kingdom	897,560	331,167	9,657	1,238,384
Yugoslavia . . . . .	..	2,160	..	2,160
Subtotal	2,716,577	1,211,728	39,974	4,004,629
World total	11,011,708	2,535,693	44,352	13,628,103

*Includes 773 Jeeps. †Not available. ‡Jan. to Nov. 1955 inclusive. §Includes 12,193 station wagons. ¶Includes 87,743 three-wheeled vehicles. ¶Renault's production in Spain. ¶Total motor vehicles published by U.S.S.R.; breakdown by types estimated by Automobile Manufacturers association. ¶World totals of passenger cars, trucks and buses separately do not equal the combined total because the motor vehicle total in some countries is not broken into cars, trucks and buses.

Source: Automotive Division, U.S. Department of Commerce.

Table II.—Monthly Factory Sales of Vehicles from Plants in U.S.

Month	1956 Passenger cars	1956 Motor trucks and coaches	1956 Total motor vehicles	1955 Total motor vehicles
January	591,032	99,221	690,253	725,379
February	560,924	102,662	663,586	744,942
March	583,169	106,813	689,982	894,597
April	552,881	101,452	654,333	881,840
May	474,010	96,476	570,486	849,393
June	445,758	92,294	538,052	767,182
July	440,980	81,143	522,123	768,621
August	417,020	86,256	503,276	716,163
September	191,202*	61,950*	253,152*	559,962
Total, nine months	4,256,976*	828,267*	5,085,243*	6,908,079

*Preliminary data.
Source: Automobile Manufacturers association.

Table III.—Exports and Imports of Motor Vehicles by Producing Countries

	1955 Exports				1955 Imports			
	Passenger cars	Trucks	Buses	Total	Passenger cars	Trucks	Buses	Total
United States	211,182	169,314	6,477	386,973	57,115	1,310	..	58,425
Canada	11,933	6,498	..	18,431	48,546	8,898	505	57,949
Subtotal	223,115	175,812	6,477	405,404	105,661	10,208	505	116,374
Australia	1,509	578	*	2,087	131,593	38,856	*	170,449
Austria . . . . .	..	..	..	..	..	..	..	..
Belgium	20,908	3,569	87	24,564	110,383	19,592	..	129,975
Czechoslovakia . . . . .	..	..	..	..	..	..	..	..
Denmark	1,175	939	..	2,114	29,701	12,534	251	42,486
France†	132,859	28,444	1,378	162,681	10,029	745	38	10,812
Germany, east . . . . .	..	..	..	..	..	..	..	..
Germany, west	344,491	57,896	1,572	403,959	16,863	137	..	17,000
Hungary	1,147	..	..	1,147	..	..	..	..
India . . . . .	..	..	..	..	9,570	7,501	*	17,071§
Italy	69,397	4,665||	583	74,645	2,400	186	..	2,586
Japan	2	1,071	322	1,395	12,225¶	3,205¶	*	15,430
Netherlands	3,502	1,056	46	4,604	49,242	14,042	160	63,444
Spain	0	0	0	0	15,458	3,503	181	19,142
Sweden	3,040	7,880	*	10,920	89,649	3,809	*	93,458
Switzerland	1,535	68	..	1,603	51,892	4,699	..	56,591
U.S.S.R. . . . .	..	..	..	..	..	..	..	..
United Kingdom	373,204	157,970	*	531,174	11,164	997	*	12,161
Yugoslavia . . . . .	..	2	..	2	2,071	174	*	2,245
Subtotal	952,769	264,138	3,988	1,220,895	542,240	109,980	630	652,850
Grand total	1,175,884	439,950	10,465	1,626,299	647,901	120,188	1,135	769,224

*Included with trucks. †Not available. ‡Includes shipments to French possessions overseas. §11 months Apr. 1955 to Feb. 1956. ¶Includes 750 station wagons. ¶Includes 6,914 cars and 1,768 trucks of foreign-made parts assembled in Japan.
Source: Automotive Division, U.S. Department of Commerce.

coast highway test which was run to obtain technical data on various turbine components under actual city and highway traffic conditions.

Another new type of engine for possible use in automobiles was unveiled during the dedication of the General Motors Technical centre near Detroit. Known as the free piston engine, it represented an entirely new concept in automotive power. Heretofore this type of engine had been used primarily in Europe for such applications as powering ships, locomotives, stationary power plants, and portable air compressors. The new G.M. engine has no crankshaft or connecting rods and no rotating drive shaft connecting it to the wheels as in a conventional automobile. The engine, which develops 250 h.p., consists of two parallel cylinders, each containing a set of two horizontally opposed pistons. Basically the pistons operate like a bicycle tire pump or old-fashioned fireplace bellows, blowing hot gases through a pipe to a turbine. These gases are relatively cool, no higher than 900° F., and therefore the turbine blades can be made of noncritical materials. A free piston engine can use a wide range of fuels, has few high precision parts, is inherently balanced and has an efficiency comparable to a diesel.

Styling.—So far as style was concerned, 1956 was mainly a face-lift year. Completely new bodies were introduced on the Lincoln and Rambler cars. Other makes had redesigned grilles, fenders and taillights. Some models were an inch lower, many were a few inches longer and even the lowest-priced series of the "low-priced three" had chrome trim. Studebaker introduced a line of family-style sport cars. At the beginning of the 1956 model year, buyers found that 60% of the various model types available were either hardtops, station wagons or convertibles. About 30 different four-door hardtops were offered as the rest of the industry adopted this model first introduced in 1955. Among the preferred body styles of 1956 was the station wagon, which had leaped from 2.3% of the market in 1947 to approximately 12% in 1956.

(See also MOTOR TRANSPORTATION.)

(C. F. KE.)

Automobile Insurance: see INSURANCE.

Automobile Racing. Pat Flaherty, Chicago, Ill., driver, captured the big prize of American racing when he won the 500-mi. Indianapolis (Ind.) Speedway classic on May 30, 1956. Roaring over the track at an average of 128.490 m.p.h., Flaherty brought John Zink's Special in at the head of a field of 33 starters. Sam Hanks of Pacific Palisades, Calif., was second; Don Freeland of Los Angeles, Calif., third; and Johnny Parsons of Van Nuys, Calif., fourth. The victor received \$93,819, a new high from a record total payoff of \$282,050. The race was slowed 11 times by accidents that brought injuries to four drivers while several others had narrow escapes.

The accidents at Indianapolis were only a few of many during the year of racing. Flaherty himself was badly injured at Springfield, Ill., on Aug. 18. Leading for the U.S. driving title, he retired for the season. He had set a record in winning a 100-mi. big car event at Milwaukee, Wis., on June 10. Bob Sweikert of Indianapolis, winner of the Indianapolis 500-mi. race in 1955 when he was the top driver of the United States, lost his life on June 17 at Salem, Ind. His car went out of control and broke into flames after crashing through a guard rail. Walt Faulkner of Long Beach, Calif., and Ernie McAfee of Los Angeles, Calif., were among other prominent drivers killed in competition during the season.

Juan Manuel Fangio, Argentina's world champion sports car driver, triumphed in the Grand Prix of Endurance at Sebring, Fla., in March. Fangio teamed with Eugenio Castellotti of Italy to bring their Ferrari home first in the sixth annual 12-hr. test.

Another feature of the U.S. season was the week-long meet of the National Association for Stock Car Auto Racing (NASCAR) held at Daytona Beach, Fla., in February. Top driving honours were won by Tim Flock of Atlanta, Ga. Among his feats was a victory in the 160-mi. Grand National Circuit test, the feature race. He also set a record qualifying mark of 135.74 m.p.h. in a Chrysler 300B. He drove the same type car to victory and a record in the passenger-car time trials with an average of 139.373 m.p.h. over a measured mile. Flock also was easy winner in the 125-mi. sportsman and modified race with a 1939 Chevrolet powered with a 1956 Oldsmobile engine.

Jimmy Bryan of Phoenix, Ariz., clinched the United States Auto club's big car title for 1956 and Pat O'Connor, North Vernon, Ind., won midwest sprint laurels. Going into Oct. 1956 Johnny Mantz was leading the stock car group, Shorty Templeman was in front of the midget car drivers and Tommy Hinner-shitz was pacing the sprint racers in the east. Buck Baker and Herb Thomas were leading on points for the NASCAR grand national championship.

Major Speed Records.—Numerous standards were improved in 1956 and Bonneville Salt Flats in Utah was the site of many record-breaking feats. The United States Auto club certified 458 international and American marks made by three 1957 Fords Sept. 9–28. Speeds reached 131.24 m.p.h. on the famous 13-mi. straightaway. One car ran 50,000 mi. at an average of 108.16 m.p.h. and averaged 120.62 m.p.h. for the first 24 hrs. The run, lasting 19 days and nights, was made on a 10-mi. circular course.

Following is a résumé of some other leading events of 1956:

Buenos Aires (Arg.)—Averaging 79.4 m.p.h. for the 3-hr. race, Juan Manuel Fangio drove a Ferrari home first.

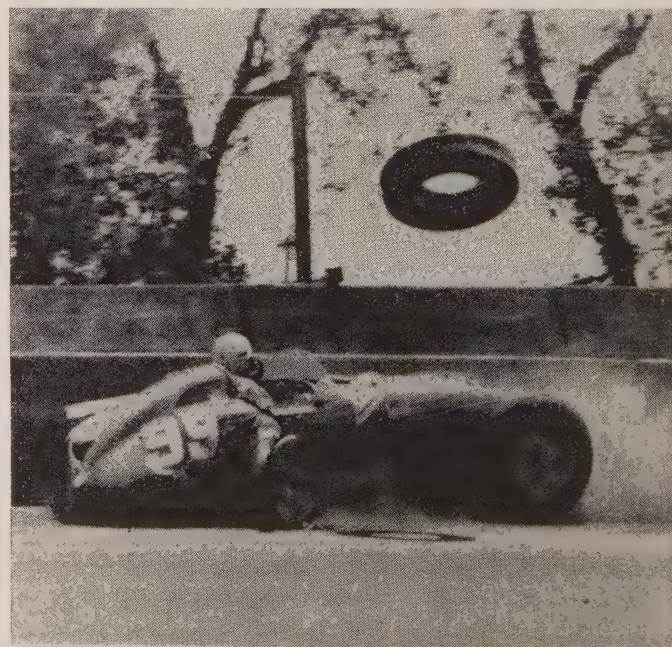
Tour de Sicily (Palermo)—Peter Collins of England (Ferrari) defeated Italy's Pietro Taruffi (Maserati) by only 55 sec. in the annual 650-mi. grind.

Syracuse (Sicily)—One of the closest races of 1956 resulted in victory for Fangio, who was clocked at 2 hr. 48 min. 59.9 sec. in his Ferrari. The race of about 200 mi. drew 80,000 fans.

Brescia (It.)—Eugenio Castellotti (Italy) captured the famed Mille Miglia road race on April 29. The veteran, in a Ferrari, negotiated the dangerous course of 992.3 mi. in 11 hr. 37 min. 10 sec. The race was run in rain and was marred by numerous accidents that brought death to three drivers and four spectators. The event drew 330 starters, but wrecks forced out many.

Monte Carlo (Monaco)—Britain's Stirling Moss (Maserati) captured first place with Fangio (Ferrari) second. Moss was the first Briton ever to win the event.

Cumberland (Md.)—The national sports car championships were held May 19–20 with Walter Hansgen of Fairview, N.J., and Paul O'Shea of Rye, N.Y., winning the two top prizes. Hansgen in a D Jaguar nosed out



TIRE FLYING high off the track as racing driver Tony Bettenhausen crashed into retaining wall during the 1956 Indianapolis, Ind., Memorial day race

Jack McAfee of Sherman Oaks, Calif. (Porsche Spyder), in modified classes B, C and D. O'Shea was first in the group for production cars of classes C and D. O'Shea, 1955 champion of the Sports Car Club of America, won in a Mercedes-Benz 300SL.

Chimay (Belg.)—Four onlookers were killed and thirteen others injured when a blazing car hurtled into the crowd watching the Grand Prix des Frontiers on May 20. The race was won by Benoit Musy of Switzerland (Maserati).

Francorchamps (Belg.)—Peter Collins (Ferrari) won the 360-mi. test when Fangio was forced out after about two-thirds of the race.

Rheims (Fr.)—Peter Collins (Ferrari) averaging 121.16 m.p.h. turned in best average speed recorded for a race on any European circuit on July 1.

Rouen (Fr.)—The fifth Rouen Grand Prix for sports cars was won by Castellotti (Ferrari).

Silverstone (Eng.)—Fangio pushed his Ferrari over the course of 303 mi. at an average 98.65 m.p.h. to gain his first victory in this event. The race drew 100,000 spectators.

Le Mans (Fr.)—One driver died and several others were injured during the Grand Prix endurance event July 28-29. Louis Hery, French driver, was killed after his car overturned and caught fire on first lap. The team of Ron Flockhart and Ninian Sanderson of Scotland (Jaguar) won the 24-hr. grind covering 2,521 mi. at an average of about 104.3 m.p.h. Only 14 of 49 starters finished the race, which was attended by 150,000 spectators.

Stockholm (Swed.)—Italy's Ferrari works clinched the world sports car manufacturers' title for 1956 when Maurice Trintignant of France won on Aug. 12. The victor's time was 6 hr. 33 min. 47.7 sec. for the 621-mi. course.

Montgomery (N.Y.)—Carroll Shelby of Dallas, Tex., one of the year's top drivers, captured his 18th and 19th consecutive sports car races on Aug. 19 in the first meet ever held at Montgomery. Piloting a 3.5-liter Ferrari, Shelby led the field of modified cars of the C, D and E classes. Shelby then won the closing event for modified cars and the first five finishers from four other races.

Thompson (Conn.)—Walter Hansgen starred in the two-day meet at Thompson raceway Sept. 2-3. Hansgen in a D Jaguar roared over the twisting 1.5-mi. course to win by only 3 sec. from John Fitch of New York city (D-Jaguar). Hansgen, Richard Thompson, Jr., of Washington, D.C. (Corvette), Paul O'Shea (Mercedes-Benz 300SL) and Masten Gregory of Kansas City were among the first-day victors.

Monza (It.)—Stirling Moss won from Fangio by only 5.8 sec., with a record average of 129.656 m.p.h. Piloting a Maserati, Moss led 24 entries representing seven countries over the course of 500 km. in 2 hr. 23 min. 41.3 sec.

Fangio retained his world driving championship, based on points.

Watkins Glen (N.Y.)—The ninth annual sports car Grand Prix on Sept. 15 was won by George Constantine of Sturbridge, Mass., in a D Jaguar. (T. V. H.)

Aviation, Civil. The year 1955 marked the completion of a decade of postwar service by the air lines of the world. It was a decade during which U.S. scheduled air lines evolved into the world's most competitive and most efficient air transport system, which carried more than 60% of the air commerce of the world outside the "iron curtain."

In 1955, the last year of the postwar decade, revenue passenger miles for the entire United States industry went up to 24,339,245,000, from 20,598,984,000 in 1954, a gain of 18.1%, while passenger revenues rose from \$1,166,554,000 in 1954 to \$1,363,580,000 in 1955 for an increase of 16.3%. Total revenues went up from \$1,420,850,000 in 1954 to \$1,607,689,000 in 1955 for a gain of 13.35%. At the same time, industry public service revenues dropped about 42%, from \$66,537,000 in 1954 to \$34,110,000 in 1955, or 2.4% of total revenues.

Express ton-miles for the entire industry totalled 51,332,000 in 1955, up 24% from the 41,524,000 total in 1954, while freight ton-miles rose from 234,850,000 in 1954 to 274,885,000 in 1955 for an increase of 17%.

The growth was continued during the first six months of 1956, as shown in Table I.

Toward the end of July 1956 the scheduled air lines of the nation carried their 300,000,000th passenger. It had required 24 years to count the first 100,000,000 passengers, four years to count the second 100,000,000 and two years to count the third 100,000,000.

In 1956 the scheduled air lines instituted a "no-show" control plan, which requires a passenger who makes an advance reservation to pick up his confirmed ticket, indicating positive reservation of a seat, before a deadline agreed to by the passenger and the air line. Failure to comply means cancellation of the reservation. This plan reduced the number of late cancellations and "no-shows"—the persons who fail to cancel reservations and do not use them—thereby making available to others



CONTROL AREA for automatic operation and regulation of runway lighting installed at O'Hare field near Chicago, Ill., in 1956

seats which would otherwise have been unoccupied.

During 1956 the air lines' Special Committee on Rotorcraft issued a report which emphasized that transport rotorcraft must be redesigned to attract the short-haul market, a market that demands low fares. The report outlined recommendations and operational procedures for two types of multiengine transport rotorcraft. One would be for serving large metropolitan centres to supplement existing ground transportation. This rotorcraft, with a capacity of 25 passengers plus baggage, would serve a radial route system, generally less than 75 mi., from a large central city to surrounding communities.

The second type of rotorcraft, with a 35 to 50 passenger and baggage capacity, would be for scheduled air transportation on intercity or local service routes which require such service but do not have the facilities to permit safe operation of fixed-wing aircraft.

Also during 1956 the scheduled air lines began negotiations with Collins Radio company for an aircraft proximity warning indicator in preparation for the use of jet planes in commercial air transportation.

Because of the special needs of the military services, a decision was made by the federal government in 1956 for a new common short-range air navigation system called vortac. The system would retain VOR (very-high-frequency omnidirectional range) to provide azimuth information. It also would call for

Table I.—Consolidated Air-Line Industry Summary, United States

Item	(In thousands)		First six months, 1955	
	1954	1955	First six months, 1955	First six months, 1956
Revenue ton-miles	2,459,187	2,906,254	1,389,328	1,576,165
Available ton-miles	4,333,640	5,049,831	2,413,273	2,727,178
Ton-mile load factor (%)	56.75	57.55	57.57	57.79
Revenue passenger-miles	20,598,984	24,339,245	11,636,497	13,272,015
Available seat-miles	33,342,727	38,545,125	18,437,386	20,658,420
Passenger load factor (%)	61.78	63.14	63.11	64.24
Operating revenues	\$1,420,850	\$1,607,689	\$779,525	\$875,902
Operating expenses	\$1,292,376	\$1,464,507	\$706,818	\$807,417

Source: Quarterly Review, Airline Traffic and Financial Data, Air Transport Association of America (Oct. 1, 1956).

installation of the tactical military navigation system (TACAN) at the same site as the VOR equipment. Such colocation of equipment would provide for common routes for both military and civil aircraft, which were essential to the maintenance and improvement of the presently overloaded traffic control system. The government decision did not interfere with the continued expansion of VOR and ILS (instrument landing system), as provided in the CAA (Civil Aeronautics authority) three-year plan.

The year 1956 also marked the beginning of a new era for the scheduled air lines as the industry prepared to enter its third equipment revolution since World War II. The new equipment would usher in the age of jet transportation. The industry, after placing its first turboprop air liners in service and ordering other new and advanced types of equipment in 1955 to the amount of \$1,700,000,000 committed itself to additional investments in equipment. By Oct. 1956 the industry had on order, for delivery beginning in 1958, a total of 279 long-range, turbine-powered giant air transports and 162 medium-range, turbine-powered air transports. The value of these aeroplanes alone would be considerably more than \$2,000,000,000, and there were indications that within the next ten years more than \$3,500,000,000 would be spent on new equipment.

The new jet planes which the U.S. scheduled carriers had on order were of two types, the turboprop, which uses the jet engine to drive propellers that pull the plane through the air, the same as present-day commercial planes fly, and the pure jet or turbojet air liner, which uses the forward thrust from the hot gases blasting out of tailpipes to push the jet liner through the skies.

The turboprop air liners were:

1. Vickers Viscount, powered by four Rolls-Royce turboprop engines, capable of carrying 48 passengers at about 385 m.p.h. for a maximum range of 1,500 mi. (28 of these were in service in the U.S. as of June 30, 1956).

2. Lockheed Electra, powered by four Pratt & Whitney T-34 turboprop engines, capable of carrying 60 to 70 passengers at about 400 m.p.h. for a maximum range of 2,000 mi.

3. Fairchild F-27 Friendship, powered by two Rolls-Royce engines, a high-wing 40-passenger short- and medium-range air liner with a cruising speed in excess of 280 m.p.h.

The pure jet air liners were:

1. Boeing 707 Stratoliner, in three versions, all powered by four engines capable of 550-600 m.p.h. (a) A 109-passenger design powered by Pratt & Whitney J-57 jet turbine engines, primarily for medium-distance hauls, (b) a similar model with Pratt & Whitney J-75 engines capable of flying nonstop across the U.S., (c) the intercontinental Stratoliner, to carry 122 passengers, with ten feet more wing span and ten feet longer cabin, capable of flying the Atlantic nonstop, with a maximum range of 4,700 mi.

2. Douglas DC-8, two models, domestic and intercontinental, both capable of 550-600 m.p.h. The domestic DC-8, powered by four Pratt & Whitney J-57 jet engines, would carry 122 passengers with a range of 3,700 mi. The intercontinental version, powered with the Pratt & Whitney J-75 jet engines, was capable of flying 4,600 mi. nonstop.

3. Convair 880, for short-range operation (700 mi.), capable of carrying 50 to 60 passengers at 500-550 m.p.h., was powered with four General Electric J-79 engines.

4. Comet, British, was capable of carrying 50-60 passengers in the 500- to 550-m.p.h. speed range. It was a medium-distance air liner powered with four Rolls-Royce jet engines.

The commercial air lines are only one user of the country's air space. In number of aeroplanes, the U.S. air-line fleet in 1956 comprised only about 1.5% of the aeroplanes in the country. The military forces had about 35,000 planes, private flyers had

about 42,000, and the business and corporate aircraft fleet totalled about 18,000.

(S. G. TN.)

Great Britain and Europe.—Air-line traffic continued to increase throughout the year, and direct operating costs were held steady in consequence of the introduction of more efficient aircraft and improvements in organization. There was some justification, therefore, for a 20% reduction in tourist fares from October on the North Atlantic services. The demand for this change was made by the United States operators under pressure from the U.S. Civil Aeronautics board and was accepted by other Atlantic operators affiliated to the International Air Transport association (I.A.T.A.). Since the reduction in fares could be met only by a marked increase in traffic, some European operators would have preferred the change to be delayed until they had got fleets of new aircraft fully into service.

British Overseas Airways corporation was one of these. Although it had made a net profit of £117,731 in the financial year 1955-56 it was involved in heavy transitional expenditure and at the end of the year was still short of aircraft. This arose from the need to prove the new Britannia turboprop liners, from a

Table II.—Revenue Air Traffic, 1955
Contracting States of International Civil Aviation Organization
(In thousands; one kilometre equals 0.62137 mile)

Contracting states as at Dec. 31, 1955	Kilometres flown	Passenger	Ton-kilometres performed	Mail	Total
			Cargo		
Afghanistan	—	—	—	—	—
Argentina	17,451	34,627	3,611	1,978	40,216
Australia	86,921	159,108	68,307	12,785	240,200
Austria	—	—	—	—	—
Belgium	26,931	57,660	21,033	5,194	83,887
Bolivia	4,540	2,970	1,250	305	4,525
†Brazil	111,260	117,905	86,939	3,418	208,262
Burma	3,466	4,522	1,249	100	5,871
Canada	73,322	169,281	24,446	12,860	206,587
Ceylon	762	708	165	8	881
Chile	7,246	12,949	1,742	115	14,806
China (Taiwan)	2,690	3,896	2,143	282	6,321
Colombia	36,222	44,656	57,764	3,458	105,878
*Cuba	10,195	15,950	1,885	165	18,000
*Czechoslovakia	7,424	7,327	1,528	1,639	10,494
Denmark	10,943	26,894	5,914	2,248	35,056
*Dominican Rep.	635	695	160	45	900
*Ecuador	55	70	10	5	85
†Egypt	3,096	4,752	1,165	92	6,009
El Salvador	—	—	—	—	—
Ethiopia	4,059	4,176	2,706	106	6,988
Finland	6,611	10,848	829	267	11,944
†France	97,770	289,919	75,376	23,040	388,335
Greece	3,824	4,824	958	134	5,916
*Guatemala	545	90	160	45	680
*Haiti	545	90	35	10	135
*Honduras	2,270	2,100	4,000	45	6,145
Iceland	4,245	8,025	2,428	152	10,605
India	34,224	45,910	27,194	7,354	80,458
†Indonesia	13,316	18,476	5,867	2,083	26,426
*Iran	4,330	2,055	1,000	35	3,090
Iraq	1,380	1,900	228	21	2,149
Ireland	5,650	11,316	1,726	451	13,493
Israel	4,237	12,912	3,035	508	16,455
Italy	16,392	34,750	5,717	2,668	43,135
Japan	10,867	27,606	3,912	2,183	33,701
*Jordan	1,190	1,345	175	55	1,575
*Korea	650	890	295	110	1,295
Laos	1,091	1,471	640	33	2,144
Lebanon	4,514	6,809	2,663	77	9,549
*Liberia	185	165	20	10	195
Libya	—	—	—	—	—
Luxembourg	—	—	—	—	—
*Mexico	76,055	116,220	35,510	7,445	159,175
Netherlands	54,247	136,384	50,991	9,081	196,456
New Zealand	13,444	23,804	7,784	1,114	32,702
*Nicaragua	1,835	560	700	15	1,275
Norway	13,366	29,444	6,014	2,562	38,020
Pakistan	4,345	9,500	2,118	447	12,065
Paraguay	—	—	—	—	—
†Peru	5,755	7,385	5,275	140	12,800
Philippines	7,694	9,805	3,954	209	13,968
†Poland	4,597	4,541	798	398	5,731
Portugal	6,270	7,182	787	685	8,654
Spain	15,271	35,918	1,966	954	38,838
Sweden	17,956	42,860	9,213	3,474	55,547
Switzerland	18,909	48,776	8,985	3,473	61,234
*Syria	1,350	1,420	130	45	1,595
Thailand	2,992	3,956	717	565	5,238
Turkey	4,293	5,077	1,217	93	6,387
Un. of S. Africa	10,436	28,815	3,448	4,013	36,276
‡United Kingdom	108,922	252,778	68,679	31,968	353,425
United States	1,255,119	3,457,285	676,821	219,433	4,353,539
*Uruguay	1,950	2,540	420	75	3,035
*Venezuela	31,610	28,505	10,790	800	40,995
*Vietnam	5,760	6,375	3,750	375	10,500
Total for 66 states	2,282,360	5,409,162	1,318,342	371,448	7,098,952

* Estimated data.

† Provisional data.

‡ Data for France include nonscheduled flights for all air lines other than Air France.

§ Data for the United Kingdom include air lines based in the U.K. only.

Note.—Figures cover total scheduled services, including international and domestic operations. Final data, except where indicated.

Source: International Civil Aviation Organization, Sept. 25, 1956.

Table III.—United Kingdom Civil Air Traffic: Scheduled Services

Item	All services		Internal		International	
	1954-55	1955-56	1954-55	1955-56	1954-55	1955-56
Miles flown (000) . . .	60,257	71,557	9,309	10,819	50,948	60,738
Passengers carried (000) . . .	2,493	3,089	1,016	1,254	1,476	1,835
Passenger-miles (000) . . .	1,537,570	1,879,162	186,127	236,617	1,351,443	1,642,545
Freight (short tons) . . .	75,644	110,935	4,660	9,821	70,985	101,114
Freight (000 short ton-miles) . . .	37,335	49,997	817	1,326	36,516	48,671
Mail (short tons) . . .	10,418	11,697	2,701	3,382	7,719	8,315
Mail (000 short ton-miles) . . .	20,226	22,574	452	615	19,774	21,960

big training program for the conversion of crews to the new types and from a delay in the delivery of the fleet of 33 Britannias. Proving flights finally had to be abandoned for the year, 60 air crews preparing for duty on Britannias were returned to other duties, and there was no hope of putting Britannias into service until the spring of 1957. The effect on the year's prospects of B.O.A.C. was expected to be serious.

Other European operators were receiving new aircraft and were engaged in putting them on the routes. Additional competition was appearing from the German company Deutsche Lufthansa, in full operation on the Atlantic services with the latest type of U.S. liner. Reaction to the American demand for cheaper tourist fares was also affected by feverish preparations to introduce jet aircraft on the North Atlantic run possibly in 1960.

The appearance of two jet liners in the United States started a rush among operators in many countries to prepare for the new era in commercial air transport. Before the test flying of the Boeing 707 and the Douglas DC-8 was completed, orders were placed for more than 200 of these aircraft, which when developed promised enough range for nonstop operation between the capitals of western Europe and New York at cruising speeds of about 550 m.p.h. This placed them in a strong competitive position in relation to the British Comet IV, capable of a range of 2,800 mi. at a cruising speed of 500 m.p.h. The Comet IV, no longer regarded as suitable for first-class Atlantic services, began to be considered for medium-range services, and a small fleet was ordered by Continental Airlines for its domestic routes in the United States. Similar jet liners were also in preparation by two manufacturers in the United States. At the end of the year B.O.A.C. and de Havilland were working out a specification for a new jet liner, the D.H. 118, capable of the same speed and range as the U.S. jets, but of smaller capacity. This was to be ready for service by 1962.

In addition to the Britannia, at least one other long-range turboprop air liner was on the stocks. B.O.A.C. was committed to the use of Comet IVs and Britannias—19 of the former and 33 of the latter—but the corporation, like most other operators, came to the conclusion that it must have at least 15 of the bigger jet liners to be able to compete on equal terms over the North Atlantic. The extent of the orders for big jets caused anxiety concerning the ability to fill all the seats that would become available in the large number of fast, new aircraft likely to appear on the routes in 1960-61. The director general of the I.A.T.A. remarked on the cost of the new equipment as repre-

Table IV.—Financial Results of United Kingdom Corporations

Item	(Financial year, April 1-March 31)			
	B. O. A. C.*		B. E. A.	
	1954-55	1955-56	1954-55	1955-56
Operating revenue . . .	£36,866,199	£42,706,582	£17,141,314	£21,599,494
Operating expense . . .	35,727,099	41,264,980	16,589,000	20,500,620
Operating profit . . .	1,139,100	1,441,602	552,314	1,098,874
Nonoperating expense (net)	877,413	1,323,871	489,275	495,260
Profit for year† . . .	261,687	117,731	63,039	603,614

*Figures exclude profit or loss on disposal of assets and redemption of stock.
†After payment of interest on capital.

senting more than a year's revenue of the world's air lines and flatly asserted that the new aircraft would demand more load than passengers alone could supply. This view was disputed by another school on the assumption that the steady annual increase of 16% to 18% in traffic of the past ten years would continue and that by 1960 additional traffic would accrue from the opening of new routes between west and east.

Support for this belief was found during the year in the emergence of the two-jet Soviet liner, the Tu-104, which made several special flights between Moscow and London and intermittently operated on routes in the Soviet Union. The U.S.S.R. also announced two new commercial types, a bigger jet and a turboprop liner, as approaching completion, and showed signs of its intention to embark on international air transport and to enter the aircraft market. The Tu-104, roughly comparable with the Comet IV, was offered for sale at about half the price of the Comet. Two services between western Europe and Moscow were started, one through Prague and another through Helsinki, with passengers transferred to Soviet aircraft on most services. One through flight from London to Moscow by a Viscount of British European airways was allowed.

Air France had a small number of two-jet Caravelle liners on order and intended to put them chiefly on the route to North Africa. Other European operators were examining the characteristics of smaller jet aircraft known to be in preparation by U.S. makers, but British European Airways seemed likely to arrive at jet operation at a much later stage.

Swissair and Sabena were adding Convair Metropolitans to their European fleets. Some re-equipment on a small scale was being undertaken by British independent operators, many of whom had been licensed to work regular services for periods up to ten years but were not sufficiently secure to warrant major capital investment programs. Among the principal operators, extremely heavy commitments were being undertaken. New aircraft on order at the end of the year represented £60,000,000 for B.O.A.C., £50,000,000 for Air France and £30,000,000 for K.L.M. (the Dutch air line). All the companies had had a profitable year, and traffic was continuing to increase. The rate of increase showed some sign of slowing down on European domestic routes, but the I.A.T.A. expected the average percentage increase of the past ten years to be realized in world traffic.

(See also AIRCRAFT MANUFACTURE; AVIATION, MILITARY; CIVIL AERONAUTICS ADMINISTRATION; JET PROPULSION.)

(E. C. SD.)

Agricultural Aviation.—Acreages covered and types of crops treated by aeroplane in the United States during 1956 varied little, generally, from 1955. Certain areas saw more, some less,

SOVIET JET AIR LINERS at London, Eng., airport in April 1956. The planes, known as Tu-104s, were used to bring various U.S.S.R. official visitors to the British city



of this activity, depending on local conditions.

Within the industry itself, advances were made in both equipment and methods. The latest developments toward achieving an ideal aircraft for applying insecticides, herbicides, fungicides, fertilizers and the like were: Auster's (England) Agricola, a low-wing monoplane with a small engine, equipped to carry a pay load of 1,200 lb.; Transland's Ag-2, a somewhat larger low-wing monoplane, designed for pay loads in excess of one ton; and National's "remanufactured" Stearman, a modification of a popular World War II biplane which utilized National's own high-lift wings and had a pay load capacity of up to one ton. All three were especially designed to carry a bigger pay load on less horsepower, and all incorporated the latest ideas in dispersal equipment to give more effective distribution of both dust and liquid chemicals.

The shortage of experienced agricultural pilots was felt during parts of the year in most farm areas. In an attempt to alleviate this situation, two more schools were opened for training commercial pilots for this type of flying, at Ohio State university and South Dakota State college. Both offered limited courses almost identical to that started by Texas Agricultural and Mechanical college in 1955. Like Texas A. and M., both had the co-operation and aid of the Civil Aeronautics administration and of state aviation and agricultural interests.

The industry's first international agricultural aviation show was held at Palmerston North, N.Z., in Nov. 1956. Held in conjunction with the seventh International Grassland congress, this meet attracted hundreds of scientists as well as agricultural and aviation interests from all parts of the world.

(W. D. AN.)

Aviation, Military. **United States Air Force.**—By June 30, 1956, the United States air force had attained 131 wings, marking the highest level of combat effectiveness since the postwar reduction from 243 wartime groups to a 1950 level-off at 48 wings. The Korean war marked the polarizing of east and west into two armed camps, and sharply reversed the trend of low defensive strength. In July 1950, the air force began an expansion toward a goal currently set at 137 wings by June 30, 1957.

This buildup enhanced the capabilities of the three combat commands—Strategic Air command (SAC), Tactical Air command (TAC) and Air Defense command (ADC)—which celebrated their 10th anniversaries on March 21, 1956.

In 1956 the SAC objective was an all-jet bomber force, with the B-52 gradually supplanting the B-36 in heavy bombardment wings. Until replaced, the B-36, last of the large piston-engine bombers, would remain a principal weapon in SAC's long-range retaliatory force. In 1956 the B-47 medium bomber still figured prominently in SAC planning.

TAC's light bomber, fighter and fighter-bomber units further increased their use of aerial refueling which added greatly to their mobility. The nuclear capability of TAC units was also increased in 1956. They were deployed in Europe, the far east and the United States. Four TAC wings were equipped with B-57 jet bombers during 1956, and one wing began receiving B-66's. The F-100, first of the truly supersonic series of fighters, began replacing the F-86, and production started on the F-104 day-fighter, scheduled for use by both ADC and TAC. Three Matador tactical missile squadrons were stationed in Europe, and a fourth squadron was organized in Sept. 1955.

Air defense of North America was bolstered by a firm agreement with Canada. In Sept. 1956 the responsibility of the Continental Air Defense command was extended to Alaska and the northeast. The joint air defense placed great reliance on the growing Distant Early Warning (DEW) line network along the

Arctic circle. Canada was constructing the Mid-Canada Warning line, north of populated areas. North of the U.S. border, the Pine Tree line was in full operation. U.S. radar stations covered areas 150 mi. out into the Atlantic and Pacific oceans, and in 1956, U.S. navy radar picket ships and U.S. air force air-borne early warning and control planes extended this coverage far out to sea. Texas towers (fixed radar stations) were being positioned off the Atlantic coast. The first installation, off Cape Cod, began operating in Dec. 1955. Two more were under construction. (See also CIVIL DEFENSE, U.S.)

In 1956, the Military Air Transport service (MATs) progressed toward its goal of increasing airlift by 50% between 1955 and 1960. With an air fleet of 1,454 planes, including 625 four-engine aircraft, MATs compiled the following record:

Year	Ton-miles (million)	Increase	Total tonnage	Increase
1955	654		194,305	
1956	776	18%	254,224	30%

In the summer of 1955, published accounts of intelligence reports indicated that the Soviet Union had made unexpected progress in the field of ballistic missiles. Late in Oct. 1955, the U.S. secretary of defense, Charles E. Wilson, assigned to the air force the task of building the WS-315A Thor, an intermediate range ballistic missile (IRBM) with a range up to 1,500 mi. In Nov. 1955, Pres. Dwight D. Eisenhower accorded the highest national priority to the research, development and production of ballistic missiles. The air force accelerated its efforts to produce the SM-65 Atlas, which would be the first U.S. intercontinental ballistic missile (ICBM), and in March 1956 announced a second source contract in Denver, Colo., to produce the Titan, an alternate ICBM. Other strategic missile developments included the supersonic SM-64 Navaho and the subsonic SM-62 Snark. In Nov. 1955, the Snark had successfully completed a 2,000 mi. flight, the longest of any U.S. missile to that date.

To complement accelerated research and production, the air force in July 1956 began instrumentation work on Ascension Island, the final and most distant station of its 5,000-mi. South Atlantic missile test range, extending southeast from the air force missile test centre, at Patrick AFB, Fla.

Two noteworthy records were established by the slender, swept-wing X-2 research plane, which was carried aloft under a B-50 mother ship and then turned loose. On July 25, 1956, Lt. Col. Frank K. Everest flew the X-2 faster than man had ever flown. In September, with Capt. I. C. Kincheloe, Jr. at the controls, the X-2 reached the highest altitude ever attained by man. The last flight of the X-2 took place on Sept. 27, 1956. While probing the thermal (heat) barrier, during this last flight which took him to his death, test pilot Capt. Milburn G. Apt exceeded Everest's earlier speed record.

At the Bikini atoll, on May 21, 1956, a B-52 flying at approximately 50,000 ft. dropped the first hydrogen bomb from a U.S. plane. The bomb, in the megaton range (a megaton is equivalent to 1,000,000 tons of TNT) was exploded over Namu Island.

In June 1956, Air Secretary Donald A. Quarles, announced a further step-up of B-52 production to reach an estimated 20 per month within 18 months. Congress authorized an additional \$900,000,000 for air force expenditure during the 1957 fiscal year, with about \$800,000,000 of it for additional B-52 procurement. This increased the air force military appropriation for fiscal year 1957 to \$16,459,000,000, 47.6% of the total military appropriation.

In other 1956 aircraft procurement, the manufacture of KC-135 jet tankers was sharply accelerated to attain a rate of 20 per month to parallel B-52 production. Increased numbers of jet Stratotankers would give SAC's retaliatory force longer range and more flexibility in employment. F-102A interceptors,



DEMON FIGHTERS, F3H-2N all-weather planes delivered to U.S. navy fleet squadrons in 1956. The plane was designed for supersonic speeds and could carry, depending upon the mission, external loads of missiles, rockets, bombs, fuel tanks or other stores in addition to its four 20-mm. cannon

initially manufactured at a low rate to permit engineering changes, began to enter Air Defense command units, and the F-89H, a modern all-weather interceptor, was delivered in quantity. The air force cancelled F-86 fighter production and used the money to purchase more F-100s. Substantial numbers of C-123 assault transports and the C-130 turboprop troop carriers were produced. The turbojet C-133A, the biggest transport to date, was designed to haul a cargo of 50,000 lb. 3,500 mi. It made its first flight in April 1956.

Air force personnel totals tapered off from 960,000 to 910,000 in the year ending June 30, 1956, simultaneously with an increase of 10 wings from 121 to 131. This increase in combat capability with fewer personnel underscored the most important problem facing the air force, that of attracting and retaining more professional and technical personnel in service. To help meet this problem Secretary of Defense Charles E. Wilson created a committee to study the question of adequate compensation of highly skilled personnel.

The air force civilian components programs received heavy emphasis. On June 30, 1956, 17 fighter squadrons of the air national guard stood runway alert with the Air Defense command. Total personnel of 63,534 manned 27 wings and 2,138 aircraft, including 1,565 jets. On the same date, one air force reserve fighter-bomber wing also stood runway alert. Air force reserve strength totalled 344,262 officers and airmen, of whom 287,731 were classified as ready.

The Mutual Defense Assistance program continued to help countries establish new air forces or modernize and expand existing forces. During 1956, 35 nations received planes and equipment plus technical and training assistance in their use. Under the program, for the seven-year period ending June 30, 1956, the U.S. air force made available \$6,500,000,000 including \$4,200,000,000 worth of material shipped to recipient nations. NATO countries received \$2,800,000,000 from this phase of the program. Since 1949, 11,827 aircraft plus spare parts and associated equipment were shipped to meet U.S. air force requirements, enabling recipient nations to form 202 squadrons (123 NATO squadrons) including 135 squadrons equipped with jet aircraft.

With total assets of \$70,000,000,000 the air force was the biggest business in the United States.

(See also AIRCRAFT MANUFACTURE; NATIONAL GUARD.)

(N. F. T.)

United States Navy.—Fleet aviation in 1956 contributed power and balance to forces designed to preserve peace in the world and to launch instant offensive action in event of war.

Emphasis on striking power rather than numerical strength remained a dominant feature of growth. Through modernization of weapons and techniques, adaptation of new weapons to naval uses, and increased capability for delivering atomic weapons, fleet forces gained a capacity to strike faster, harder and over greater areas than ever before. Although the number of operating units was slightly increased, numbers of aircraft and personnel on board remained about the same. Navy and marine corps combined, the strength of naval aviation in Jan. 1956 was 9,600 operating aircraft and 28,000 officers and 161,000 enlisted men.

Attack carrier forces were strengthened in 1956. Commissioning of the U.S.S. "Saratoga" on April 15 and launching of the U.S.S. "Ranger" on Sept. 29 added one Forrestal class carrier to the fleet and promised another within months. Six Midway and Oriskany class conversions completed during the year added as many angled decks to fleet power potential.

To operate from these ships, two all-weather fighters, the F3H-2N Demon and F4D Skyray, and the fast interception and attack type FJ-4 Fury, joined the fleet early in 1956. Twin-jet A3D Skywarriors, capable of transcontinental flights in less than five hours without refueling; A4D Skyhawks, small but hard-hitting attack planes; and F9F-8P Cougar photographic planes also went into operation. The F8U Crusader, winner of the Thompson trophy with a record speed of 1,015.428 m.p.h., and the F11F Tiger completed carrier suitability trials in April.

Three guided-missile systems were fully operational. The first carrier missile squadron, equipped with F7U-3M Cutlass aircraft armed with Sparrows, deployed to the Mediterranean. Carriers, cruisers and submarines conducted operations with the surface bombardment missile, Regulus I. Patrol squadrons acquired new offensive power with the assignment of the antishipping missile Petrel. Commissioning of the U.S.S. "Boston", Nov. 1, 1955, and the U.S.S. "Canberra", June 15, 1956, added two Terrier missile cruisers to fleet air defense.

Other aviation elements were similarly strengthened. Anticipating the operational assignment of P6M SeaMasters, conversion of the seaplane tender "Albemarle" to support jet seaplanes began in February. The four-engine turboprop seaplane, R3Y Tradewind, joined fleet logistic support forces and demonstrated its capability as an aerial tanker for use in conjunction with carrier aircraft operations. Commissioning the first helicopter assault carrier, "Thetis Bay", added vertical envelopment tactics to new concepts of amphibious assault.

Progress in advanced research was marked by the inclusion of funds for nuclear power plant components for an aircraft carrier and a guided missile cruiser in the 1957 shipbuilding program, beginning construction of a prototype reactor and study of the feasibility of adapting nuclear power to large seaplanes.

Several outstanding flights demonstrated progress in aircraft and engine design. On Oct. 15, 1955, an A4D Skyhawk established a 500-km. world speed mark of 695.163 m.p.h. A3D Skywarriors scored several unofficial records, the most outstanding being a 3,200 mi. nonrefueling flight from Honolulu, T.H., to Albuquerque, N.M., in 5 hr. 40 min. Two P2V Neptunes and two R5D Skymasters forged the first air link with Antarctica in a flight on Dec. 20, 1955, from New Zealand to McMurdo sound. Most outstanding was the record speed set by the F8U-1 Crusader on Aug. 21, 1956. In standard carrier fighter configuration during

its record performance, this was the first operationally equipped jet aeroplane in history to exceed 1,000 m.p.h.

(See also MARINE CORPS, U.S.; MUNITIONS; NAVIES OF THE WORLD.) (W. V. D.)

Air Forces of the World.—Several developments took place during 1956 which promised to have an important bearing on the future direction and progress of world military aviation.

For the first time since World War II, the U.S.S.R. revealed something of Soviet air power potential and technical achievements. On June 24, leading military representatives, including Gen. Nathan F. Twining, U.S. air force chief of staff, and newsmen of all principal countries were treated to a mass demonstration and flying display at Moscow's Tushino airport. This was followed by visits to several aircraft and engine plants and the Kubinka air force base.

Meanwhile, most of the member nations of NATO continued the buildup of their respective air forces and aircraft production. Both Germany and Japan re-entered the aircraft manufacturing field and achieved some notable accomplishments during the year. Oddly enough, it was France who took one of the first steps to put western Germany's aviation industry back on its feet by licensing German companies to build the French Fouga Magister and the Nord 2501 Noratlas aeroplanes.

On Oct. 29, 1956, Israel invaded Egypt, backed up by the armed forces of England and France. Within a short time the Egyptian air force had reportedly been destroyed, and British Canberra bombers, with Hunter Hawker fighter escorts, had bombed all military objectives around the Suez canal. What effect, if any, this would have on the other air forces of the world remained to be seen.

U.S.S.R.—At Tushino, the Soviet air force displayed an array of operational aircraft ranging from record-breaking helicopters through turbojet transports, supersonic day fighters, light, medium and heavy jet bombers, a transonic all-weather interceptor and a large turboprop bomber having intercontinental range.

In a fly-by of experimental types, foreign visitors got a first glimpse of the 1,200-m.p.h. Super Farmer MIG-21, designed by a team headed by Artem Mikoyan. Also seen for the first time were three new delta-wing aircraft, designed by Pavel Sukhoi, capable of supersonic flight in the estimated range of Mach 1.5. Although it was too early to evaluate the significance of these particular fighters, they showed that the Soviets had not neglected the delta type of design. For lack of official designations, NATO observers nicknamed these aircraft Fishbed A, Fishbed B and Fishpot.

The most important aircraft shown at Tushino, according to General Twining's report, was a twin-jet light bomber, code named Blowlamp by the U.S. air force. Obviously capable of high performance, this plane was considered a replacement for the IL-28 Beagle, thousands of which had been built over the past eight years.

Two new models of Yakovlev's Flashlight-type fighters also made their debut at Tushino. One of these was an all-weather fighter, with finely profiled engine nacelles projecting well ahead of and behind the sweptback wings. Presumably, this was to be a direct replacement for the Yak-25. The other apparently was designed for photo-reconnaissance and attack functions, and featured a glassed-in nose for housing the navigator.

A giant four-engine turboprop intercontinental bomber, reportedly of Ilyushin design, but code named the Bear, was put into full service during 1956. Estimated to gross about 330,000 lb. and achieve speeds up to 650 m.p.h., the Bear was said to be capable of flying 8,000 mi. without refueling. Other new types of aircraft, or modifications of aircraft formerly known, which were displayed during the year included: the MIG-23, an improved version of the MIG-19, having two small axial-flow jet

engines in the fuselage and a very high-set tail; an assault transport, credited to the designer Oleg Antonov, but bearing a striking resemblance to Stroukoff's U.S.-built C-123; and several helicopter types, including the Yak-24 (Flying Boxcar) Horse, the largest rotary-wing aircraft in squadron service anywhere.

In April, the U.S.S.R. had approximately 17,000 aircraft in combat units, including 3,000 shore-based planes to support fleet units; also 3,000 transports, according to testimony given by General Twining before the U.S. House Military Appropriations subcommittee.

Great Britain.—An economy-minded government cut back Britain's military spending program for 1956 and cancelled numerous development and aircraft production contracts. There was mounting internal criticism of the government's policy, with many officials, aviation experts and publications voicing the fear that the country was being saddled with obsolete aircraft and rapidly becoming a fifth-place contender among the air powers of the world. With the Hawker Hunter just coming into limited service, a cutback in production of the Gloster Javelin to about 100 planes and the cancellation of several advanced fighter projects, Britain's stable of fighter aircraft held little that was in the class of the U.S.S.R.'s latest MIGs, or the United States' Century series of fighters. Cancellation of plans to build Avro of Canada's CF-105 delta-wing fighter in England left Saunders-Roe's SR-53 supersonic interceptor and English Electric's P.1 fighter the only remaining entries under development in this field.

In the bomber category, Britain's picture was a little brighter. Production of the "V" series of jet bombers, the Avro Vulcan, Handley Page Victor, and Vickers Valiant continued at a moderate pace. A limited quantity of these were turned over to the R.A.F. Bomber command and were put into operational service during 1956. English Electric's Canberra lightweight bomber continued to represent the bulk of the R.A.F.'s bomber force. Several modified and improved versions of the Canberra B.8 model and PR9 photo-reconnaissance type, appeared during the year.

Britain's aircraft engine development and production presented the brightest spot in the country's entire aviation industry. Dependable gas turbine engines of all types, ranging in power from 1,000- to 19,000-lb. thrust, were produced or under final stages of development. Newest turbines displayed at Farnborough in September included the Rolls-Royce R.B.109 Tyne, R.Co. 8 Conway by-pass and R.A.29 Avon; Bristol's 705 and 755 Proteus, BO1.12 Olympus, an Orpheus and a B.E.25 Orion; Armstrong Siddely's latest Sapphire, and de Havilland's 15,000-lb. thrust Gyron. This latter turbojet engine was updated to produce more than 19,000-lb. thrust later in the year, making it one of the most powerful engines of this type in the world.

Other military aircraft shown at Farnborough for the first time were: the Fairey Gannet 4 antisubmarine aeroplane; the Gloster Javelin T-3 trainer; Vickers Supermarine N. 113 naval fighter; Supermarine Swift Mk. 7; an armed version of the Folland Gnat; a de Havilland D.H. 110 with pointed radome nose, and a Mk. 6 Hawker Sea Hawk with underwing armament.

On March 10, a Fairey Delta 2 research plane was flown by Peter Twiss to what was then a new world record of 1,132 m.p.h.

The Royal Aircraft establishment announced in September that it had designed and built a 50,000-lb. rocket at its Westcott propulsion centre. Britain's first nuclear weapon dropped from a plane was released from a R.A.F. Valiant over Maralinga, S. Austr., during tests on Oct. 11.

France.—Expansion of the French air force and the country's aircraft procurement program moved forward at a quickened pace during 1956. Mounting unrest and outbreaks in North African colonies created an immediate need for more planes and pilot training. Consequently, in April, the French air force ordered 300 North American T-6s, 100 Beech T-11 trainers, and



Above: Ilyushin bombers, built by the U.S.S.R. for the Egyptian air force, flying in formation at an air show over Cairo, Egy., in Sept. 1956

Below: Multiple refuelling of four U.S. navy jet fighters from a R3Y-2 Tradewind transport in Sept. 1956



Above: B-52C Stratofortress on a test flight in May 1956



Left: F-104A Starfighter, claimed to be the world's fastest combat plane, shown for the first time in 1956

Below, left: T-6 Texan (above) in final flight before being retired from service as a U.S. training plane in 1956. Shown below the T-6 is the T-28 trainer which replaced it



Below, right: British Vickers Supermarine N. 113 jet fighter warming up aboard the aircraft carrier "Ark Royal" during test trials of the plane in May 1956. The N. 113 was designed to carry an atomic bomb



60 Douglas B-26s (all obsolete U.S. aircraft), plus 60 Morane-Saulnier 733 armed trainers, 48 SIPA 12 armed trainers, and 310 Max Holste M.H. 1221 Broussard light transports for ambulance work in North Africa. A large quantity of helicopters was also ordered, including 50 H-21C Vertol's, 50 S-58 and 50 S-55 Sikorsky's, and 60 Bell 47s, which were used to good advantage in the fight against guerrillas in Algiers.

In April, the minister of national defense released details of the current military aircraft orders and procurement plans. It was revealed that the government had on order 150 Dassault Mystère II fighters, of which 40 had been delivered; 253 Mystère IVs, with 128 already delivered; 375 Mystère IV Bs for delivery starting in 1957; 140 SNCASO Vautours, with orders for 210 more about to be placed; 200 SNCAN 2501 Noratlas transports, with 90 delivered to date; 183 SNCASE S.E.3130 Alouette helicopters (100 for the air force, 60 for the army, and 23 for the navy) and 60 SNCASO Djinn helicopters for the army. It was further revealed that the government was sponsoring two prototypes of the S.E.3200 heavy transport helicopter.

The French naval air service was comprised at this same time of approximately 140 carrier-borne aircraft, 7 heavy antisubmarine groups, 1 antisubmarine flying-boat group and about 380 miscellaneous aircraft, including 20 helicopters.

Marcel Dassault's Etendard II and Etendard IV (formerly designated the Mystère II and IV) jet tactical-support fighters made their first flight in July. A French air force order for 305 of these aircraft made the Etendard the first European fighter capable of supersonic speeds in level flight to be ordered in quantity.

Other military aircraft under development or first flown in 1956 included the Sud-Est X. 116 Fonceur, Breguet's 1050 Alize Dart-powered antisubmarine aeroplane, Sud-Est's S.E.212 Durandal lightweight fighter, and Sud-Ouest's S.O.9050 Trident.

France made substantial progress in the guided-missile field during the year and had four missiles in operation: the Arsenal 5201 and 5210, the SFECMAS 5103 and the CT.10 target missile. An experimental Veronique rocket was fired to an altitude of 84 mi. during summer tests.

Italy.—The Aerfer Ambrosini Sagittario II, lightweight fighter developed with the aid of U.S. funds, made its first flight May 21. Powered by two Rolls-Royce Derwent 9 engines, rated at 4,000-lb. thrust, this aircraft reached a speed of Mach .94 at an altitude of 27,000 ft. in early flights at Pratica di Mare airport near Rome. The Sagittario II was built as an experimental prototype for the Ariete, seven of which were ordered built by NATO.

In August, Fiat's G.91 tactical fighter, designed around the Bristol Orpheus engine by Giuseppe Gabrielli, made its first flight at Turin, It. Thirty of these fighters were ordered by NATO for experimental evaluation.

The Italian air force announced in August that it would sponsor construction of prototypes of the Macchi M.B.326 basic trainer and the Piaggio P.155 heavy amphibian. The government also indicated that funds for prototypes of the Agusta X-1 helicopter, the Aerfer jet target plane, and a turboprop transport would be made available at a later date.

Sweden.—Saab Aircraft Co., at Linköping, put the J 35 Draken into quantity production for the Swedish air force. A one-man all-weather interceptor, powered with a Rolls-Royce Avon engine, the Draken proved capable of speeds well above Mach 1.

In May, the Swedish air force took delivery of its last J 29 "flying barrel," and speeded up the re-equipping of its attack wings with the higher-performing J 32 Lansen. This 2-seat, all-weather fighter, powered by a Swedish-built Rolls-Royce Avon 7 engine, had a speed of more than 700 m.p.h.

German Federal Republic.—Under the U.S.-German mili-

tary aid agreement announced in 1955, and the subsequent licensing agreements with companies of other NATO nations, western Germany in 1956 started the climb back to its former role as one of the world's major air powers. In July, the German Lower House Budget committee proposed expenditures that called for the purchase of 1,741 aircraft and the establishment of an air force consisting of 2,500 flying personnel and 77,500 ground crew.

Immediate orders to Republic Aviation Corp. (U.S.) for 558 F-84F Thunderstreaks and RF-84F Thunderflashes followed in August. Orders were also placed with Britain's Armstrong-Whitworth company for 68 Hawker Sea Hawk Mk. 4 naval fighters, with Fairey Aviation for 16 Gannet antisubmarine aircraft, and later with Bristol for Sycamore helicopters.

Under licensing agreements with foreign manufacturers, many of Germany's famous old-line aircraft builders reopened their plants for business. By October, the western German defense ministry had announced orders for 671 military aircraft from German firms. These included 194 Italian Piaggio trainers from Focke-Wulf A.G. at Bremen; 360 French Fouga C.M. 170R Magister jet trainers from Flugzeugunion Sued G.m.b.H. (consisting of Messerschmitt A.G. and Heinkel A.G.); 469 German DO 27 reconnaissance planes from Dornier; and 117 French SNCAN 2501 Noratlas transports from Flugzeugbau Nord G.m.b.H., (consisting of Weserflug A.G., Hamberger Fahrzeug G.m.b.H. and Siebel A.T.G. G.m.b.H.).

The air force received its first planes in August; 29 Canadian-built T-6 Mk. IVs and 20 Piper L-18C Super Cubs, for primary training at the Landsberg air base. The German naval air arm, with planned operational bases at Jagel and Nordholz, had 20 air cadets in preliminary training at Pensacola, Fla.

Spain.—The Spanish air force had 82 jet aircraft in operation by midsummer, and was due to receive additional F-86 Sabres during the fall. Two lightweight fighter designs were under development during 1956 for ultimate production by Spanish firms. One, the HA-300, was a supersonic fighter grossing about 7,000 lb. and powered by a Bristol Orpheus with afterburner. This aircraft was an outgrowth of Spain's first jet aeroplane, the HA-200-R1 Saeta, designed by Willi E. Messerschmitt, and built by Hispano Aviación in 1955. The other, a supersonic delta-wing fighter powered by a Bristol Orpheus turbojet, was being developed by Construcciones Aeronauticas, of Madrid, with the aid of E. Heinkel. It was designated the C.H.-101.

Japan.—The first Japanese-built F-86F came off the production lines of Mitsubishi Heavy Industries Ltd., and was successfully flown in September. Under licence agreements with U.S. firms, Mitsubishi, Toyo Aircraft Manufacturing Co., Kawasaki Aircraft Co. and Fuji Heavy Industries were all building planes for the Japanese defense agency with U.S. aid and sanction.

As of July 1, the Japan self-defense forces' flying equipment consisted of 43 F-86F, 72 T-33A (including 7 Kawasaki-built), 112 T-34, 130 T-6G, 1 D.H. Vampire, 1 T-28B, 1 KAL-2 and 30 C-46 aircraft for a total of 390. The Maritime Self-Defense force had 6 P2V, 16 PV-2, 10 TBM-35, 10 TBM-3-W, 2 PBV-6A, 4 JRF-5, 11 SNJ, 1 T-34, 1 KAL-2, 3 S-55, 3 S-51 and 5 HTL aircraft, or 72 total. 1 Saab-91B Safir in the Technical Research institute, and 104 L-19, 33 L-5, 56 L-21, 1 KAL-1, 5 H-19 and 6 H-13 planes in the Ground Self-Defense force brought the total defense forces' strength to 668 aircraft of all types.

The defense agency's program for the 1957-58 fiscal year called for the creation of 3 additional air wings with 320 aircraft and 10,000 men. Three prototypes of a new Japanese light jet trainer, the T1F1 designed by Fuji, were ordered.

(See also ARMIES OF THE WORLD; AVIATION, CIVIL; CIVIL AERONAUTICS ADMINISTRATION; JET PROPULSION; MUNITIONS.)
(Wn. A. S.)

Avocados: see FRUIT.

Awards and Prizes of 1956: see AMERICAN LIBRARY ASSOCIATION; ANTHROPOLOGY; GEOGRAPHY; LITERARY PRIZES; MINERALOGY; MOTION PICTURES; NOBEL PRIZES; PULITZER PRIZES; RADIO AND TELEVISION; ROMAN CATHOLIC CHURCH; SOCIETIES AND ASSOCIATIONS, U.S.; etc.

Azores: see PORTUGAL.

Bacteriology. **Synthesis of a Virus.**—Working independently, Barry Commoner at Washington university, St. Louis, Mo., and H. L. Fraenkel-Conrat and Robley C. Williams at the University of California, Berkeley, were able to obtain inert fragments of tobacco mosaic virus which, when combined, produced an active virus capable of infecting a tobacco leaf. Although this work concerned a plant virus, it heralded new approaches to the defense against virus diseases. It appeared possible to recombine viruses so that they would be unable to initiate the disease, yet would combine with host tissue cells and prevent infection by an active virus during epidemics. Such immunity would be of short duration. A more lasting, active immunity, however, might follow a series of inoculations of such synthesized viruses.

The Orphan Viruses.—With the advent of tissue culture techniques for viruses (living human or animal cells suspended in tubes or flasks of buffered nutrient solutions) it was inevitable that some viruses would be isolated for which no known disease had been established. Such viruses had been facetiously referred to as "orphans in search of a disease," hence the term "orphan viruses." During 1956 this group was more formally named enteric cytopathogenic human orphan viruses, or ECHO viruses. The members of this group were obtained from the intestinal tracts of patients with the aseptic meningitis syndrome (often diagnosed as nonparalytic poliomyelitis) as well as from healthy children in different parts of the world. Thirteen antigenically distinct viruses were described and several others were announced in preliminary reports. If and when any one of the established types should be identified as the aetiological agent of a clinically distinct disease, it would be removed from the ECHO group of viruses.

Adenoviruses.—The armed forces and the public health authorities were greatly concerned over the epidemic proportions of the upper respiratory infections occurring in military recruits. Studies of such epidemics at army and naval training stations as well as children's summer camps yielded a number of viruses serologically related to a few strains also isolated by tissue culture but from apparently healthy persons. These viruses belonged to a broad adenovirus group which produced acute infections of the respiratory and ocular mucous membranes and the regional lymph nodes. All strains possessed a common antigen demonstrable by the complement fixation test, while their type specificity was indicated by the neutralization test. The types were given numbers instead of the customary name of the kind of infection produced. The use of such terminology was expected to eliminate confusion that might arise from the fact that a single serotype could produce clinically different diseases, and conversely, that clinically similar illnesses could be produced by different adenovirus serotypes as well as unrelated agents. This and similar work since 1945 made it increasingly evident that what was often called a cold might very well have been an upper respiratory infection caused by one of any number of related and unrelated viruses.

Vaccine for a Dread Cattle Disease.—Rinderpest, although unknown in the United States, is much feared because it could slip past the nation's borders any time and is an obvious choice as a biological warfare weapon. Rinderpest is the deadliest of cattle diseases, killing 90% to 100% of the animals infected.

U.S. herds are highly susceptible to this minute virus. The agent is passed by direct contact with an infected animal or contaminated straw bedding. U.S. government scientists produced an effective vaccine by combining the chemically killed virus with an adjuvant consisting of cell material derived from *Mycobacterium butyricum*, a water-nonmiscible substance and an emulsifier. The vaccine was used successfully in Africa and Asia where rinderpest killed millions of cattle annually.

Fresh Food for the Future.—Fresh foods normally contain or are coated with numbers of bacteria proportional to the quality and extent of handling and processing they receive. The total number as well as the type of organisms involved largely determines the rate and kind of spoilage which occurs. By slowing down the metabolic processes of these bacteria with refrigeration, such foods can be preserved a little longer, but this increase in time provides a very narrow margin from the processor to the cooking pot. Antibiotics such as aureomycin, terramycin, and streptomycin were added to a number of food products, resulting in improved keeping quality. Mixed salad greens were maintained fresh twice as long when they were dipped in a solution of antibiotic before packaging as undipped greens. Similarly, traces of antibiotics lengthened the life of pasteurized milk from a few days to several weeks. Hamburger, notorious for poor keeping quality, maintained a fresh taste for more than ten days under refrigeration when just 1 part per 1,000,000 of antibiotic was added to the meat. Ten parts per 1,000,000 of antibiotic in slush-ice used in chilling poultry after dressing proved effective in hindering the development of spoilage organisms. This process was equally effective in prolonging the effective storage time of fresh fish.

The U.S. Food and Drug administration, while recognizing these advantages, also saw some disadvantages: (1) a small percentage of persons are allergic to these antibiotics and could not tolerate even small amounts in their food without severe reactions, and (2) when preservatives were added to food in the past, there was the danger of such drugs' masking poor quality and handling. Under such circumstances bacteria which do not spoil the food but could cause disease might have a greater chance of contaminating the product and even multiplying therein. Many such bacteria would not be inhibited by the concentrations of the antibiotic used. After much consideration, the Food and Drug administration granted permission for the use of 7 parts per 1,000,000 of aureomycin to remain on uncooked, dressed poultry. This ruling recognized that in the cooking process the food is rendered safe and the residual antibiotic destroyed. While this affected only poultry, the precedent was set so that it appeared only a matter of time before many other foods which required cooking would be preserved with antibiotics.

Radiation.—Although not approved by the Food and Drug administration, the preservation of food by gamma-radiation had been actively investigated since 1950. The shelf life of food was lengthened by many times. The chief disadvantages of this form of preservation were the production of off-flavours, odours and discolorations in many foods, especially meats and dairy products. Foods so affected were milk, cheese, bananas, orange juice and frankfurters. Foods which appeared to be quite acceptable following treatment were asparagus, bacon, green beans, beef liver, broccoli, Brussels sprouts, carrots, chicken, codfish cakes, pork and pork sausage. Although many products appeared satisfactory after treatment, it was expected to be at least two years before tests on the wholesomeness of such products could be completed.

(See also EAR, NOSE AND THROAT, DISEASES OF; POLIOMYELITIS; RESPIRATORY DISEASES.) (L. J. LeB.)

ENCYCLOPÆDIA BRITANNICA FILMS.—Antibiotics (1952); Bacteria—Friend or Foe (1954); City Water Supply (1941); Defending the City's Health (1941); Immunization (1955); Protozoa (1956).

Badminton.

All six titles changed hands in the third open amateur tournament of the American Badminton association, held at the St. Joseph's college field house in Philadelphia, Pa., April 4-7, 1956. Finn Kobbero, Danish star from Copenhagen, dethroned Joseph Alston of Pasadena, Calif., in the men's senior singles, 15-11, 15-8, in the final round. Judy Devlin of Baltimore, Md., regained the women's laurels she had lost to Margaret Varner in 1955 by defeating the Boston (Mass.) miss, 12-10, 11-6. Kobbero teamed with J. Hammergaard Hansen, a countryman, to capture the men's doubles and paired with Judy Devlin for the mixed doubles crown. Ethel Marshall and Beatrice Massman of Buffalo, N.Y., gained the women's doubles honours and Rupert Mee and Robert Traquair of Buffalo took the veterans' doubles.

The national junior championships were played at Detroit, Mich., March 24-26. Gary McFarlane of Lewistown, N.Y., won the boys' singles by conquering Russ Paquette of Detroit 15-10, 13-15, 15-7. MacGregor Stewart of Baltimore successfully defended the girls' title by beating Norma Slauer of Marblehead, Mass. Paquette took the boys' doubles and Misses Stewart and Slauer the girls' prize. Bill Bryant and Marcia Dotson of St. Paul, Minn., won the mixed doubles.

Eddy Choong of Malaya triumphed in the men's singles of the All-England championships at London, March 14-17. In the last round of the tournament, which drew a big field of international stars, Choong subdued Kobbero, 11-5, 15-3, 15-11. The ladies' final was an all-United States affair and Margaret Varner retained her title by halting Judy Devlin, 11-7, 11-5. Kobbero teamed with J. Hammergaard Hansen to retain doubles laurels, halting another Danish team, J. Nygaard and P. E. Nielsen, 18-14, 15-5. The Devlin sisters, Judy and Sue, carried home the ladies' doubles prize by defeating Iris Rogers and June Timperley of England, 17-18, 15-12, 15-12. Joseph Alston took the major prize in the finals of the Scottish Badminton union's invitation tourney at Glasgow, March 21-24. The Pasadena star defeated F. Sonnevile of Indonesia, 15-2, 13-15, 15-12, in the men's singles. Lois Alston and Miss Varner teamed to capture women's doubles.

Another important event on the sports calendar in 1956 was the invitation tournament held by the Niagara Falls (N.Y.) Country club. Canadian players captured the singles awards. Dave McTaggart, the Canadian champion, routed Don Smythe of Toronto, 15-5, 15-1, in the men's final and Jean Waring of Calgary, Alta., the Canadian women's titleholder, defeated Arleigh Hepworth of Toronto, 11-7, 12-10. Ong Poh Lim and Teik Hock of Malaya beat Kobbero and Hansen, 16-18, 15-10, 15-7, in the men's doubles. Ethel Marshall and Beatrice Massman won from the Misses Hepworth and Waring, 15-4, 15-3. (T. V. H.)

Bahama Islands.

This British colony consists of 21 inhabited and 680 uninhabited islands extending southeastward from the Florida coast for 760 mi. Area: 4,404 sq.mi. Pop. (1953 census) 84,841 (about 88% Negro); (1955 est.) 94,000. Language: English. Religion: Christian. Capital: Nassau (pop., 1953 census, 46,125), on New Providence Island. Governor in 1956, Earl of Ranfurly.

History.—Government revenue for 1956 was estimated at £3,758,660 and expenditure at £3,630,756. Tourism was again the colony's principal source of earnings. The sponge fisheries, wiped out by a marine plague in 1938, were reopened experimentally from January to March and were then closed for the rest of the year. Sales were good and quality said to be better than 20 years earlier. A U.S. group entered into contracts for the construction of a £12,000,000 shipyard and other works connected with the projected free port at Hawksbill creek, Grand Bahama; the same group formed a company to build and operate a chemical lime plant. In February the house of assembly unanimously passed a

motion condemning colour discrimination in public places; all hotels agreed to drop the colour barrier. At a general election in June a party system appeared for the first time when six candidates of the left-wing Progressive Liberal party were returned. A substantial number of the 21 "white independents" elected later combined to form a Conservative party. One independent supporting the Progressive Liberal party and one member of the Bahamas Democratic league completed the new house.

(R. H. Y.)

Education.—Schools (1954): primary 180, pupils 21,366; secondary 7, pupils 1,076; technical 1, pupils 403; 1 teachers' training college, with 62 students. Higher education: Queen's college, St. Francis Xavier's academy, St. John's college, Long Island Christian institute.

Finance and Trade.—Monetary unit: pound sterling=U.S. \$2.80. Budget (1955 est.): revenue £3,522,000; expenditure £3,167,000. Foreign trade (1955): imports £10,860,000; exports £1,080,000. Main exports: pit props, timber, crawfish, salt, okras, tomatoes.

Bahrein: see PERSIAN GULF STATES.

Baking Industry. The following statistics on the production of the wholesale segment of the U.S. baking industry compare the 1954 tonnage (published in 1956) with the 1947 tonnage, the latter figures being the most recent census of manufactures. These figures are only for the wholesale segment of the industry, bakers selling their products through grocery stores, hotels, restaurants and institutions. Retail bakers, multiple-unit retailers and house-to-house bakers are excluded since they are not included in the annual survey from which the figures are taken.

Wholesale Production of Bakery Goods in the U.S.

Product	(In pounds)	1954	1947
Bread, white pan		8,615,290,000	8,521,157,000
Bread, white hearth		252,820,000	306,117,000
Whole, cracked and other dark wheat breads		996,029,000	893,411,000
Rye, including pumpernickle		620,278,000	613,391,000
Rolls, bread type		1,501,624,000	942,791,000
Sweet yeast goods		642,610,000	612,328,000
Soft cakes		1,034,748,000	1,210,207,000
Pies		692,633,000	600,641,000
Cookies		52,385,000	80,596,000
Doughnuts		344,662,000	309,591,000

Source: Bureau of the Census, Department of Commerce.

Tonnage figures indicate that sales of white bread were up 3.7% for 1955 compared with 1954; other breads increased 1.6%, sweet goods 2.1%, cake .8%, pie 3.1% and doughnuts 1.5%. About 65% more prepared frozen dessert pies were produced in 1955 than in 1954. The estimated output was 44,762,473 lb. as against 27,195,745 lb. in 1954. The volume of frozen baked products was up 12%. Bakery use of sugar was up 11% in 1955 over 1954.

The total number of workers in U.S. bakeries during May 1956 was 290,100, compared with 284,000 in May 1955; production workers numbered 172,100 compared with 171,200 in 1955. Average weekly earnings for bakery employees were \$73.67 compared with \$68.97; hourly earnings averaged \$1.81 as against \$1.70. Average hours worked per week were 40.7 as compared with 41.1 the previous year. In the biscuit, cracker and pretzel group, weekly earnings averaged \$65.51 as against \$62.96; weekly hours were 39.7 compared with 40.1 and hourly earnings \$1.65 compared with \$1.57.

Experiments with atomic irradiation for bread preservation tended to show that irradiated bread would not mold but would get stale. It was also found that a too-high rate of irradiation spoils the flavour. The best results from irradiation were obtained with the "brown-and-serve" type of products. The life of these items was extended and rolls retained their flavour and freshness. However, general use of the process was thought to be at least 10 years away.

The "Better Breakfast" campaign, designed to stimulate the demand for bakery products, was repeated in 1956 with increased momentum. Mayors of several large cities joined the program and

proclaimed "Better Breakfast Week" in their communities. The "July Is Picnic Month" promotion was also repeated in 1956 and a "National Sandwich Idea" contest to promote the use of bread was jointly sponsored by the Wheat Flour institute and the National Restaurant association.

(See also **WHEAT**.)

(M. M. Bd.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Bread* (1945); *Principles of Baking* (1943); *Principles of Cooking* (1943).

Balance of Payments: see EXCHANGE CONTROL AND EXCHANGE RATES; INTERNATIONAL TRADE.

Balearic Islands: see SPAIN.

Balkan States: see ALBANIA; BULGARIA; GREECE; ROMANIA; TURKEY; YUGOSLAVIA.

Ballet: see DANCE: *Ballet*.

Baltic States: see ESTONIA; LATVIA; LITHUANIA.

Baltimore. Baltimore, the metropolis of Maryland, had 949,708 inhabitants according to the 1950 census, when it was the sixth largest U.S. city. On July 1, 1956, its estimated population was 966,000. The land area of the city is 78.7 sq.mi.; the water area, 13.2 sq.mi. Mayor in 1956: Thomas D'Alesandro, Jr., Democrat.

Budget appropriations for 1956 were \$192,152,430.83; for 1955 they were \$183,436,904.48. The city tax rate for 1956 was \$3.13 per \$100 of assessed valuation; the rate for 1955 was \$3.05. The taxable basis for 1956 was \$3,093,173,138, for 1955, \$2,936,005,029. The gross funded debt as of June 30, 1956, was \$295,536,900; the sinking funds amounted to \$29,207,127, leaving a net debt on that date of \$266,329,773, not including accrued income. The percentage of net debt to the taxable basis (excluding self-supporting indebtedness) was 5.54% as of June 30, 1956.

The net enrolment on Oct. 31, 1955, in the public schools of the city was 149,783 students; in addition, approximately 25,000 students were enrolled in adult education classes. John H. Fischer was superintendent of the Baltimore city schools. The public schools of Baltimore are a separate and distinct unit and are not under the jurisdiction of the state department of education. The integration of schools for white and Negro students had been carried into effect in Sept. 1954.

Ranking as the second U.S. port in foreign trade tonnage, Baltimore had a combined volume of exports and imports during the year 1955 amounting to 25,619,150 tons, an increase of 34.3% from the 19,076,087 tons for the previous year. The large gain in foreign trade volume resulted from substantially increased exports of coal and grain and imports of metallic ores during the year. The port's foreign commerce in 1955 was valued at \$973,000,000, as against \$968,300,000 in 1954. New port records were established in 1955, when 5,369 ocean-going vessels in all categories of water-borne trade arrived at Baltimore and 4,278 deep-draught ships utilized the Chesapeake and Delaware canal route to and from the port.

Baltimore's output of manufactured products was at a record high during 1955. Industrial employment in the area increased steadily throughout the year, averaging 2½% higher than in 1954. During the first half of 1956, it showed a continuing month-to-month gain, reaching a peacetime high of 206,400 workers in June.

At the midpoint of 1956, the 10 leading industry groups, in order of volume of employment, were primary metal industries (42,700), transportation equipment (40,200), food and kindred products (21,400), apparel (15,900), fabricated metal products (14,300), chemicals (10,300), printing and publishing (9,700), nonelectrical machinery (9,100), electrical equipment (8,300), and stone, clay and glass products (6,300).

Baltimore's marked growth in new production facilities continued in 1955 with a total announced investment of more than

\$263,000,000 for new plants and expansions. The increase in the local manufacturing capacity was greatly accelerated during the first seven months of 1956, when the announced investment for such purposes amounted to \$286,000,000, a sum that far exceeded the total for any full year in the history of the community.

(C. N. E.)

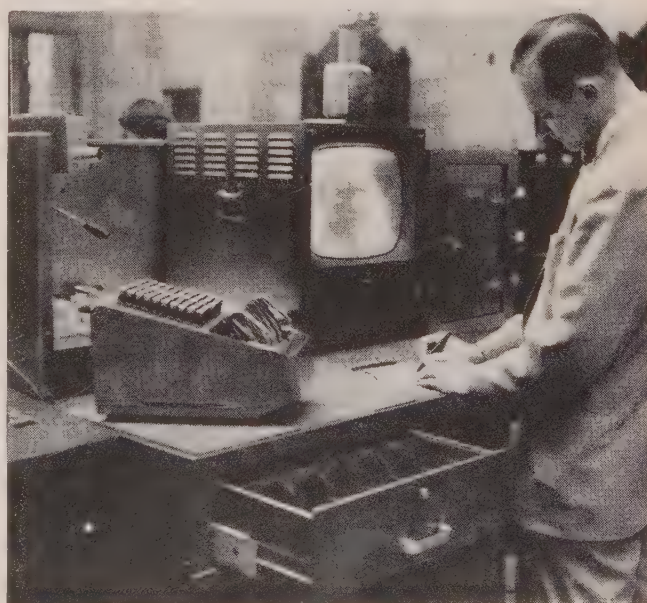
ENCYCLOPÆDIA BRITANNICA FILMS.—*The Baltimore Plan* (1953).

Bananas: see FRUIT.

Banking. Demands for credit and capital funds generally were extremely high in the United States in 1956, as they had been during the previous year. Corporate security offerings, commercial and industrial loans and state and municipal security offerings were especially strong, with some declines in mortgage financing and instalment credit financing. The federal reserve system continued to pursue a monetary policy of severe restraint. Interest rates, both bond yields and short-term money market yields, rose during 1956 to the highest levels in about a quarter of a century.

Tight Money and Credit Squeeze.—Sharply rising interest rates and lessened availability of credit featured banking developments during 1956. Over-all demands for credit and capital were at record high points. State and municipal offerings in the first nine months of the year reached a total of \$4,050,000,000 as compared with \$3,974,000,000 in the corresponding period a year before. Moreover, municipal bond approvals in the November election were reported in an amount exceeding \$2,300,000,000, thus indicating continued high levels of state and local bond flotations.

The increase in total mortgage debt on nonfarm one- to four-family houses during the first nine months of 1956 was \$8,500,000,000 as compared with \$9,800,000,000 during the corresponding months of 1955, which had been a record period for mortgage financing. The dollar amount of nonfarm mortgages of \$20,000 or less recorded for the first nine months of 1956 was 5% below the same period of 1955, but 26% above the corresponding period of 1954. Likewise, the increase in instalment credit during 1956 was somewhat less than in 1955. The rise in total consumer credit from January through September 1956 was \$1,500,000,000 as compared with \$3,900,000,000 in the corresponding period a



BANKING BY TELEVISION introduced at the Mechanics and Farmers Savings bank, Bridgeport, Conn., in 1956. Two-way screen and speaker arrangement permitted the customer, in his automobile, and the teller, in the bank, to see and talk to each other throughout the entire transaction

year earlier. These declines in demands for funds from the mortgage area and consumer credit area slightly cushioned the effect of the record business demands for funds during the year. Moreover, the federal cash surplus totalled \$10,400,000,000 during the first nine months of calendar year 1956 as compared with \$3,300,000,000 in the first nine months of 1955. As a result, during that period in 1956 the government was able to make net cash repayment of borrowing in the amount of \$8,433,000,000.

Business Demands for Credit and Capital.—The demand for bank loans by business enterprises was enormous. The net increase in commercial and industrial loans at all weekly reporting member banks was \$3,206,000,000 in the last six months of 1955 and \$2,243,000,000 in the first six months of 1956. Business expenditures for plant and equipment rose from a record level of \$29,700,000,000 in the third quarter of 1955, annual rate seasonally adjusted, to an extraordinary peak of about \$38,000,000,000 in the fourth quarter of 1956. In addition, the book value of inventories of manufacturing and trade firms at the end of Sept. 1956 was \$6,500,000,000 greater than a year previous. Moreover, corporations made heavy income tax payments in the first six months of 1956 as a result of stepped-up schedules for payment and record 1955 levels of corporate profits. As a result, business firms experienced a major decline in holdings of cash and U.S. government securities in the first half of 1956 and were forced to borrow heavily in the credit and capital markets. In the first six months of 1956 government security holdings of corporations were reduced net by \$6,000,000,000 as compared with a reduction of only \$500,000,000 in the first six months of 1955. While internal financing, retained profits and depreciation charges in total were at record levels during 1956, these sources of funds failed even to cover plant and equipment outlays. Corporations, therefore, found it necessary to make record offerings of corporate securities in the capital markets.

Total corporate offerings of new securities in the first nine months of 1956 were \$7,932,000,000, about 9% greater than in the same months a year before. Such offerings during 1955 had reached a new peak of \$10,240,000,000. Offerings of bonds during the first nine months of 1956 totalled \$6,155,000,000 of which about 54% were publicly offered and 46% privately offered. During the same period offerings of preferred stock totalled \$434,000,000, and offerings of common stock totalled \$1,342,000,000.

The net change, that is, new issues less retirements, in outstanding corporate securities totalled \$7,223,000,000 during 1955. Of this amount, \$4,513,000,000 took the form of a net increase in outstanding bonds and notes and \$2,710,000,000 was in the form of a net increase in stocks. The net increase in outstanding corporate securities, including bonds and notes and stocks, was in turn about 20% greater in the first half of 1956 than in the first half of 1955.

Interest Rates.—During 1956 the combination of high demands for funds, the portfolio position of institutional investors and restrictive federal reserve policies brought about sharp advances in interest rates and falling bond prices. Short-term interest rates moved up sharply and spreads between interest rates in the maturity structure became the lowest since the early 1930s. The yield on new issues of three-month treasury bills went up from a low of 2.17% late in March to a 23-year high at 3.17% late in Nov. 1956. The rate on prime commercial paper, 4 to 6 months, rose from 3% early in the year to 3½% in October and November.

In the corporate bond market the yield on Moody's (investors service) average of Aaa corporate bonds rose from a low of 3.07% early in the year to 3.73% late in Nov. 1956. This com-

pared with annual ranges of 3.44% to 2.98% in 1953, 3.11% to 2.85% in 1954, and 3.18% to 2.91% in 1955.

Yields on long-term treasury bonds rose and prices fell sharply during 1956. The long-term 3½% government bonds dropped from a high of 106½ early in 1956 to a low of about 98 late in the year, at which price the yield was 3.37% to maturity. The 3% bond due in 1955, a 40-year maturity, offered in 1955, went down from about 101 to a low of about 93, to yield about 3.32%.

The municipal market was particularly hard-hit by stringency in money market conditions. The yield on Standard and Poor's average of high-grade municipals rose from a low of 2.55% early in the year to a high of 3.45% late in November. This was the highest level of yields and the lowest level of bond prices on municipal bonds since the late 1930s.

Mortgage credit also encountered a particularly tight situation. Discounts in the secondary market rose and serious difficulty was encountered in obtaining funds. Early in December the Federal Housing administration raised the basic rate on FHA-insured mortgages from 4½% to 5%, and the Veterans administration announced that it might ask congress for authorization to increase the rate correspondingly on GI-insured home loans.

Commercial Banks.—Total loans and investments of all commercial banks reached a new peak in the second half of 1956, amounting to \$162,100,000,000 on Sept. 26, 1956. The increase in bank earnings assets during 1956 was somewhat less even than during the previous year, however, as restrictive federal reserve policies continued forcing commercial banks to sell government securities in an amount which provided much of the funds to permit a substantial increase in loans. Total loans reached a new record peak of \$88,500,000,000 at the end of Sept. 1956, after a nine-month increase of \$5,900,000,000 and a rise of \$10,100,000,000 over the end of Sept. 1955. Commercial bank holdings of government securities on Sept. 26, 1956, amounted to \$57,000,000,000, a decrease of \$4,600,000,000 since the beginning of the year. Other securities, chiefly holdings of state and local governments, stood at \$16,500,000,000 on Sept. 26, down \$200,000,000 during the nine-month period. Thus, the increase in total loans and investments at all commercial banks was \$4,800,000,000 in the year ended Sept. 1956 and was only \$1,200,000,000 during the first nine months of the year.

On June 30, 1956, national banks, which numbered 4,667, held \$100,826,000,000 of total deposits. State banks, which numbered about 9,000, had total deposits of \$85,525,000,000.

Total earnings of commercial banks in 1956 were well above the previous year, reflecting a continuing increase of earnings on loans with a slightly lower level of earnings on government securities. Although current expenses increased, net current earnings were higher, as were dividends.

The Bank Holding Company act of 1956 was approved May 9, 1956. Pursuant to that act the board of governors of the federal system issued Regulation Y, effective Sept. 1, 1956, providing for registration of bank holding companies, limitations on size and extent of bank holding company systems, and divestment of interest in nonbanking organizations.

Money Supply.—The privately held money supply reached a new record peak, with allowance for seasonal change, on Sept. 26, 1956, at \$214,200,000,000, including demand deposits adjusted, \$105,400,000,000; time deposits at commercial banks, mutual savings banks and the postal savings system, \$81,200,000,000; and currency outside banks, \$27,500,000,000. The increase over the figure of a year before was \$4,500,000,000, with the rise coming primarily in time deposits. In the year ended Sept. 1956 the increase in demand deposits adjusted was only \$600,000,000 and the increase in currency outside banks was \$300,000,000.

Money in circulation, that is, currency and coin outside the treasury and federal reserve banks, showed little change other than seasonal during the year, with a net increase of only about \$300,000,000.

The volume of bank debits at commercial banks and the rate of demand deposit turnover rose to new record heights reflecting further expansion in the economy. Debits to demand deposit accounts at banks in 343 leading centres in the third quarter of 1956 were 6.4% above the total reported for the corresponding period a year before. Likewise, the annual rate of turnover or velocity of demand deposits, which indicates the rate at which people and business enterprises spend their "check book money," reached new highs in the summer of 1956, but later flattened out with only minor year-to-year gains recorded. (J. K. L.)

Mutual Savings Banks.—For a second time since the close of World War II the combined assets of all mutual savings banks in the United States increased by more than \$2,000,000,000 in a 12-month period. The net gain in these combined assets for the year ended June 30, 1956, was \$2,042,152,481 or 6.70%, bringing total assets at the end of the period to \$32,502,979,754. This compared with a net gain in combined assets of \$2,063,836,641 or 7.27% during the year ended June 30, 1955. The funds on deposit increased in amount by \$1,856,131,095 or 6.81% in the year ended June 30, 1956, to a total on that date of \$29,185,222,811. The increase in deposits for the year ended June 30, 1955, was \$1,891,197,342 or 7.43%. Surplus funds on June 30, 1956, amounted to \$2,930,308,819, or slightly more than 10% of the amount due depositors. There were 21,241,264 depositors being served by mutual savings banks on June 30, 1956, an increase of 398,636 or 1.91% during the year ended that date, compared with an increase of 349,451 or 1.70% in the previous 12-month period.

The number of mutual savings banks in the United States remained at 527 on Sept. 30, 1956, but the number of branches in operation increased to 347 from 320 on Sept. 30, 1955.

During the year ended June 30, 1956, the average rate of dividend credited on deposits rose from 2.71% to 2.85%, higher earnings having enabled 280 of the 527 banks to credit dividends for the latest dividend period at the rate of 3% or more.

Real estate mortgage loans continued to be the chief outlet for new funds of mutual savings banks. On June 30, 1956, mortgages constituted 56.70% of the combined assets of all mutual savings banks. The remaining assets consisted of U.S. government securities, 25.59%, other securities, 12.78% and other assets, 4.93%. On June 30, 1955, the combined assets were composed as follows: U.S. government securities, 28.51%, other securities, 13.71%, real estate mortgage loans, 52.52%, other assets 5.26%.

An important factor in the ability of mutual savings banks to increase their investments in real estate mortgage loans had been the postwar banking law revisions which permitted nationwide lending, principally in loans insured by the Federal Housing Administration (FHA) and the Veterans administration (VA). A survey at the end of 1955 showed that 28% of all real estate loans were out of the state in which the lending institution was located, and such loans were for the most part government agency guaranteed.

As of June 30, 1956, the three states selling savings bank life insurance, Massachusetts, Connecticut and New York, had a combined total of \$891,110,374 of life insurance in force, covering 702,214 policies. This was a gain of \$56,293,768 and 20,151 policies in force in the year ended that date. During the same year the number of issuing banks selling life insurance increased from 93 to 94 and the number of agency banks from 185 to 187. Agency banks sell insurance as agents of other savings banks but not for their own account.

The large increase in deposits in the special investment department resulted mainly from transfers from the ordinary department in order to take advantage of the higher dividend rates, which in special investment departments ranged from 2 $\frac{3}{4}$ % to 3 $\frac{1}{2}$ %, whereas the ordinary departments paid only 2 $\frac{1}{2}$ %. (HE. BR.)

Other Countries.—Pressures imposed by the further development of the movement toward tighter official credit policies, begun in 1955, made 1956 another difficult year for banking institutions in the United Kingdom, the Commonwealth, Europe and the middle east. With inflationary pressures showing a marked tendency to persist throughout these regions, official bank rates were increased in many countries in order to raise the general level of interest rates sufficiently to discourage capital development spending. More direct measures to discourage bank financing of capital outlays taken in many countries were also widely adopted, including the banning of certain types of lending, the fixing of maximum levels for overdrafts and the enforcement of more severe rules regarding the proportion of bank resources to be employed in liquid form.

Banking turnovers had generally ceased to expand or showed much smaller increases than previously. The rise in advances and deposits was also slowed down or halted in most countries and in some cases was in some measure reversed. These developments inevitably affected the domestic finances of the banking system adversely by interrupting the previous steady expansion in business, although banks' earnings benefited considerably from the advance in interest rates. Their current account circumstances were, therefore, more favourable on balance generally than in 1955, but the depreciation of fixed interest investments, caused by the tendency for market values to fall as the general level of interest rates rose, caused continuing anxiety in some cases.

In Great Britain the official decision to raise bank rate a further 1% to 5 $\frac{1}{2}$ % early in 1956 was immediately followed by an increase of about the same order in rates of interest quoted for the general run of bank business. The efforts of the banks to reduce overdrafts were assisted during 1956 by the decision of the chancellor of the exchequer to direct the nationalized industries to satisfy their requirements of development finance from budget funds instead of covering such outgoings by borrowing from the banks pending the raising of permanent capital in the new issue market. The loans under this heading rose fairly steeply in the first half of the year, and then showed a falling tendency.

The tendency for the banks to cut advances exerted a downward pressure on their deposits. The decision of a number of them to reduce their investment holdings further, partly by sales in the market and partly by refusing to convert into new bonds maturing government securities, also tended to depress deposits. However, the inability of the government to cover the budget deficit and the repayment of loans reaching final redemption dates by long-term borrowing forced the treasury to obtain funds on a large scale from the banking system against treasury bills. In consequence, though advances and investments showed a combined fall of £300,000,000 on the year in October, deposits recorded a net contraction of only £100,000,000.

Early in the year there were substantial withdrawals of savings bank money, because higher rates were obtainable in other fields. The government's decision to give tax-free status to the first £15 per annum of interest earned by balances on ordinary accounts later stimulated a reflux of money to these institutions.

Following a further deterioration in the country's balance of payments, the Australian authorities decided to reinforce monetary measures for combating inflationary trends early in 1956. Through consultation with bank managements and manipulation of the special account procedure for freezing part of the banks' resources, the central bank induced the commercial banks to keep lending figures from rising.

The New Zealand authorities further developed the stringent monetary policy inaugurated in the previous year. A new procedure was introduced whereby the commercial banks were placed under a direct pressure to keep their total loans below a ceiling set by the central bank. The intention was to vary the banks' minimum obligatory liquidity ratios so that they could extend credit beyond the official limit only by obtaining additional liquid money from the central bank at a rate of interest exceeding that which could be earned on "excess lending."

In South Africa the banking system came under pressure early in the year, because of the movement of money to other centres to take advantage of higher interest rates and the deficit in the country's external payments. Restrictions on the movement of short-term funds and strengthening of the domestic interest rates structure eased the position. In Rhodesia a new central bank was established with powers to influence in considerable measures the activities of the commercial banking system. Private interests set up a merchant bank to promote the development of a money market modelled on that operating in the United Kingdom.

There was a sharp expansion in banking turnovers in India during 1956 and deposits and advances also rose sharply. To facilitate the financing of the second five-year program, legislation was introduced to amend the Reserve Bank of India act. In Pakistan steps were taken to strengthen the facilities provided by the state bank for the financing of agriculture.

The Canadian authorities made a series of increases in the bank rate in 1956 and also tightened liquidity requirements imposed on commercial banks and discouraged them from participating in certain forms of lending. The rise in bank deposits accordingly slowed down toward the close of the year.

Many countries, among them the German Federal Republic, the Netherlands, Finland and Turkey, made substantial increases in official bank rates to arrest the expansion in bank lending in 1956. The Greek government introduced a three-point program for co-ordinating monetary banking and credit policies and creating a unified and flexible money market. The remodelling of the German commercial banking system on prewar lines was completed and the government took steps to reshape the central bank.

In Egypt the freezing of foreign bank funds after the nationalization of the Suez canal in July made extensive rearrangement of banking business necessary.

In Israel many commercial banks introduced new types of saving schemes to help official efforts to finance development without inflation. In Libya a new bank was opened with capital subscribed by the authorities and private investors to finance development. In Syria a central bank was established and took over the functions of bank of issue previously carried out by the Bank of Syria and Lebanon, a privately owned institution.

(See also BUSINESS REVIEW; CONSUMER CREDIT; DEBT, NATIONAL; EXPORT-IMPORT BANK OF WASHINGTON; FARM CREDIT SYSTEM; FEDERAL DEPOSIT INSURANCE CORPORATION; FEDERAL RESERVE SYSTEM; GOLD; INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT; SAVINGS AND LOAN ASSOCIATIONS; STOCKS AND BONDS.) (C. H. G. T.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*The Federal Reserve System* (1950); *Using the Bank* (1947).

Baptist Church. Great interest was created among Baptists of the United States by the visit during May and June 1956 of five Russian Baptists representing approximately 500,000 Baptists in the U.S.S.R. The total number of Baptists in Russia was estimated as 3,000,000—of whom 2,500,000 were not affiliated with the Union.

The Executive Committee of the Baptist World Alliance meeting in Washington, D.C., May 1956, voiced deep concern over

the continued persecution of Protestants in Colombia, and sincere regrets that the Evangelical Theological seminary in Madrid, Sp., had not been reopened. Resolutions respecting these two restrictions of religion were forwarded to the president of Colombia and the Spanish chief of state.

The American Baptist association meeting in Little Rock, Ark., June 26–28, 1956, with 3,500 attending, reported receipts of \$98,730.57 for missions and endorsed 31 interstate and foreign missionaries. Sales of publications for the year totalled \$155,604.72. Resolutions opposing the decision of the U.S. supreme court on segregation, and giving moral endorsement to the American Council and International Council of Churches were passed. Fresno, Calif., was chosen for the 1957 meeting.

During 1955 and 1956, the American Baptist convention, the National Baptist Convention, U.S.A. Inc., the National Baptist Convention of America, the North American Baptist General convention, the Baptist General Conference of America and Canadian Baptists expressed a desire to participate with the Southern Baptist convention in a five-year program to observe the 150th anniversary of the organization of Baptist work on a national level in the United States and North America. It was to begin in 1959 and close in 1964.

The Baptist General Conference of America, meeting in Waukegan, Ill., June 27 to July 1, 1956, was one of the best attended in its 77-year history. It reported 26 new churches, and that its total of 451 churches had 58,000 members and a Sunday school enrolment of 75,000.

The American Baptist convention meeting in Seattle, Wash., in June 1956, passed a resolution urging the United States government to abandon hydrogen bomb tests in the Pacific. It declared such tests harmful to missionary work, dangerous to the Japanese economy, with adverse effects on the Asiatic people and posing a long-range threat to the human race. The 1957 session of the convention was to be held in Philadelphia, Pa., and would celebrate the 250th anniversary of the founding of the Philadelphia Baptist association, the first in America; the 125th anniversary of the organization of the American Baptist Home Mission society; and the 50th anniversary of the convention itself.

The Southern Baptist convention met in Kansas City, Mo., May 30 to June 2, 1956. Its relief committee reported that for the first time in ten years it did not have sufficient funds to meet the needs of its missionaries to relieve the extreme suffering of the people with whom they worked. The Home Missions board planned to establish 1,000 new churches annually for the next three years. The 1957 convention was scheduled to meet in Chicago, Ill. (See also CHURCH MEMBERSHIP.) (R. E. E. H.)

Barbados. This British colony is the most easterly of the Caribbean islands. Area: 166 sq.mi. Pop.: (1946 census) 192,800 (77.3% Negro, 17.5% mixed, 5.1% European); (1955 est.) 230,000. Language: English. Religion: Christian (about 70% Anglican). Capital and chief port: Bridgetown, pop. (1954 est.) 18,000 (metropolitan area 80,000). Governor in 1956, Sir Robert Arundell; premier, Grantley H. Adams.

History.—In March 1956 the ministries, the secretariat and the crown law officers moved into a new block of government buildings erected at a cost of B.W.I. \$397,000 (British West Indian dollars). Legislation to aid hotels was enacted exempting from import duty materials to be used in the building of new hotels or the extension of those already existing. Certain income tax concessions were also granted to new hotels. Grants totalling B.W.I. \$2,020,800 from colonial development and welfare funds were approved to assist with the development of the water resources of the island, the tenantry road program, the erection of a third health centre and the extension of the runway and terminal building at Seawell airport. The regional police

training school to train recruits from the Leeward and Windward islands and Barbados began operations in November. Plans were prepared for the erection of a new 600-bed hospital estimated to cost B.W.I. \$3,331,000.

The Federal Capital fact finding commission visited the island in June.

In the elections for the house of assembly held in December, the Barbados Labour party gained 15 of the 24 seats, and the leader of the party, Grantley Adams, who was premier during the previous session, was again invited by the governor to form a government.

(D. A. Ws.)

Education.—Schools (1954): public elementary 124, pupils 33,697, government-aided secondary 10, pupils 3,086. Higher education: Codrington college (affiliated to Durham university, Durham, Eng.), students 28; Erdiston teachers' training college, students 32; Barbados evening institute; the technical institute in St. Michael opened in 1955.

Finance and Trade.—Monetary unit: British West Indian dollar, B.W.I. \$1.7=U.S. \$1. Budget (1955 est.): revenue £3,116,000; expenditure £3,514,000. Foreign trade (1955): imports £11,500,000, exports £8,090,000. Principal exports: sugar, molasses, rum. Sugar crop (1954): 171,000 metric tons.

ENCYCLOPÆDIA BRITANNICA FILMS.—*Caribbean* (1955).

Bardeen, John (1908—), U.S. physicist, received the 1956 Nobel prize in physics jointly with Walter H. Brattain and William B. Shockley (*qq.v.*) for perfection of the transistor in 1948. The three—members of a research team at the Bell Telephone laboratories in Murray Hill, N.J.—shared a cash prize of \$38,633 provided under terms of the will of Alfred Nobel. Announcement of the winners' selection by the Swedish Academy of Sciences was made at Stockholm on Nov. 1, 1956.

Bardeen was born at Madison, Wis., May 23, 1908, and received his bachelor's and master's degrees from the University of Wisconsin, and his Ph.D. from Princeton university. He was a geophysical engineer for a petroleum research corporation from 1930 to 1933, taught physics at the University of Minnesota from 1938 to 1941, and was head physicist of the U.S. naval ordnance laboratory in Washington, D.C., for the next four years. From 1945 to 1951 he was associated with the Bell Telephone laboratories where he, Shockley and Brattain developed the transistor, a minute semiconductor that found wide application in electronics as a substitute for the conventional vacuum tube in a multitude of communications and industrial devices. In 1951 Bardeen joined the faculty of the University of Illinois as professor of physics and electrical engineering. In 1952 he was recipient of the Balmain medal of the Franklin institute.

Barley. The 1956 U.S. barley crop, indicated at 370,254,000 bu., was the fourth largest of record, much larger than the 278,166,000-bu. average for 1945–54 but smaller than the 400,295,000-bu. crop of 1955. Harvested acreage, somewhat reduced by drought in portions of the Great Plains, was 12,867,000 ac., as compared with 14,553,000 ac. in 1955 and an average of 10,443,000 ac. for the decade 1945–54. The indicated yield of 28.8 bu. per acre was high, as compared with 27.5 bu. in 1955 and a 26.6-bu. average for 1945–54. North Dakota, as in 1955, was the leading producer (72,521,000 bu.), closely followed by the usual leader, California (69,844,000 bu.), and by Minnesota (28,280,000 bu.) and Montana (27,710,000 bu.).

The official support price of 92 cents per bushel for grade 2 better, as announced in February, was later increased to \$1.02, 76% of parity. Prices at harvest time to the producer averaged about 95 cents per bushel, nearly the same as in 1955. Heavy feeding use and record high exports (97,600,000 bu.), largely to Europe and Japan, took a record 440,900,000 bu. during 1955–56, about 98,800,000 bu. more than in 1954–55 and much more than average. Imports were nearly 25,000,000 bu. Carry-over on July 1 was 114,800,000 bu., 12% smaller than in 1955.

Estimated barley stocks in principal exporting countries as of

Barley Production of the Principal Producing Countries

(In thousands of bushels)

Country	1956*	1955	Average 1945–49	Average 1935–39
U.S.S.R.			272,000	425,000
United States	370,254	400,295	273,306	238,622
China			322,244	347,000
Canada	278,000	252,225	141,171	88,882
France	252,610	122,680	52,500	53,004
Turkey	137,790	146,980	68,675	96,129
India	126,980	133,930	106,255	90,253
United Kingdom	126,470	137,010	91,895	36,596
Denmark	109,700	101,050	64,345	52,881
German Federal Republic	105,000	95,500	43,740	79,000
Japan	96,500	99,020	56,046	73,113

*Preliminary estimate.

July 1, 1956, were at a record high of 314,000,000 bu., as compared with 267,000,000 bu. a year earlier. The 1956 world barley crop was estimated at 3,290,000,000 bu., as compared with 3,080,000,000 bu. in 1955 and only 2,375,000,000 bu. average pre-World War II. The increase was particularly marked in western Europe where winter-damaged fall sown grains were replanted with barley. World acreage expanded to 139,750,000 ac. as compared with 135,650,000 ac. in 1955 and only 117,420,000 ac. average prewar.

(J. K. R.)

Baseball. The first perfect game in world series history dwarfed all other baseball developments in 1956. Donald James Larsen of the New York Yankees, a 27-year-old righthander whose pitching career hitherto had reflected only mediocrity, won everlasting fame on Oct. 8 in the fifth game of the postseason classic. He stunned the Brooklyn Dodgers, 2 to 0, at Yankee stadium by retiring 27 successive batters on 97 pitches. No one reached first base off Larsen, whose unusual pitching style found him throwing without a windup. Larsen needed only one run for a working margin and centrefielder Mickey Mantle supplied it in the fourth inning with a home run. Another Yankee run in the sixth inning proved to be superfluous. The victim of Larsen's masterpiece was 39-year-old Brooklyn pitcher Sal Maglie. His five-hitter deserved a better fate, but on this day, baseball had room for but one hero.

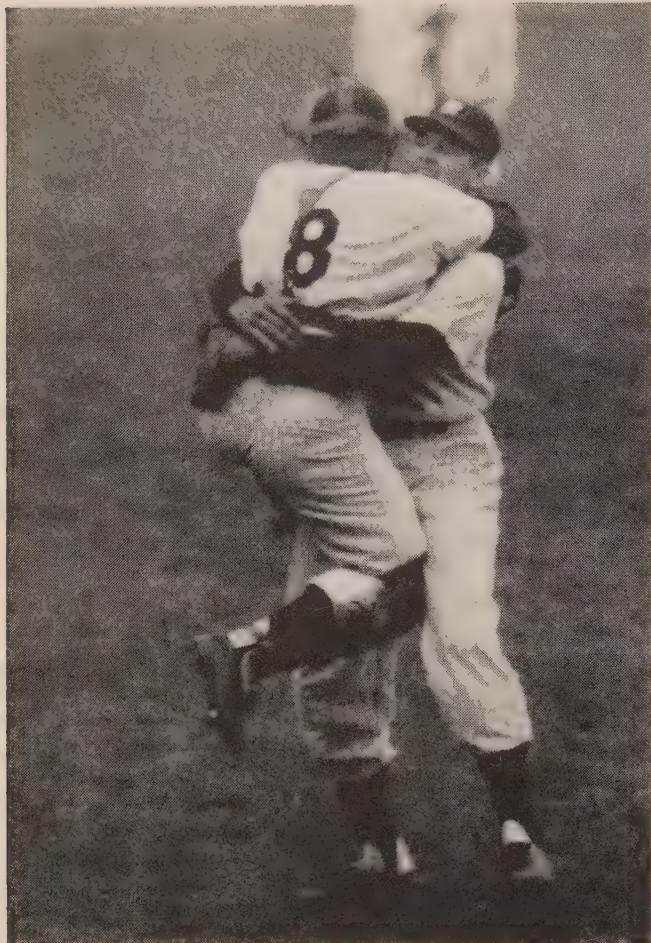
Weighing all factors, Larsen effected the finest individual baseball performance of all time. The last perfect game in the major leagues was posted by Charlie Robertson of the Chicago White Sox against Detroit in 1922. Five men before Robertson also had pitched perfect games in regular-season play. But Larsen alone created his miracle amidst the pressure of a world series. His triumph gave New York a 3 to 2 lead in the series and the impetus to move on to its 17th world championship in 22 series appearances. Elsewhere on the baseball front in 1956, the lucrative franchise of the Detroit Tigers changed ownership.

On July 16, an 11-man syndicate headed by Michigan radio-television executives Fred Knorr and John Fetzer bought the Tigers and Briggs stadium from the Briggs estate for a record price of \$5,500,000. The sale became effective on Oct. 1. Club president Walter (Spike) Briggs, Jr., was retained as executive vice-president and general manager.

On July 23, Hank Greenberg, former Detroit and Pittsburgh first baseman, and Joe Cronin, erstwhile shortstop for Washington and the Boston Red Sox, were initiated into the Hall of Fame at Cooperstown, N.Y.

Cronin, general manager of the Red Sox, figured in the news again on Aug. 7 when he fined outfielder Ted Williams \$5,000 for an outburst of temperament toward fans and sports writers during a game against the Yankees.

Major League Races.—The National league pennant race was undecided until the final day of the season. Brooklyn finally won out by a scant one-game margin over Milwaukee. Cincinnati, in third place, was only two games back. In one of the most exciting finishes in recent years, Milwaukee held a one-game edge over the Dodgers with three games left to play for both clubs.



CATCHER LARRY (YOGI) BERRA leaping into the arms of pitcher Don Larsen after Larsen pitched a perfect game (no hits, no runs, no man to reach first base) for the New York Yankees in the 1956 world series. Larsen's feat was the first no-hitter in series history and the first perfect game since 1922 in the major leagues

The Braves, however, dropped two games to St. Louis while Brooklyn was sweeping three games from Pittsburgh.

In the American league, the New York Yankees turned on the pressure in the final half of the season to breeze home with a comfortable nine-game edge over runner-up Cleveland. The Yankees brought Manager Casey Stengel his seventh flag in the past eight years. The Chicago White Sox, 12 games behind, nosed out the Boston Red Sox for third place by one game.

Table 1.—Final Major League Standings, 1956

Standing at close of season, Sept. 30				Standing at close of season, Sept. 30			
Natl. League	Won	Lost	Pct.	Amer. League	Won	Lost	Pct.
Brooklyn	93	61	.604	New York	97	57	.630
Milwaukee	92	62	.597	Cleveland	88	66	.571
Cincinnati	91	63	.591	Chicago	85	69	.552
St. Louis	76	78	.494	Boston	84	70	.545
Philadelphia	71	83	.461	Detroit	82	72	.532
New York	67	87	.435	Baltimore	69	85	.448
Pittsburgh	66	88	.429	Washington	59	95	.383
Chicago	60	94	.390	Kansas City	52	102	.338

Source: The Sporting News, the National Baseball Weekly.

World Series.—The New York Yankees and Brooklyn Dodgers, world series rivals in 1955, took up where they left off to bring a stirring climax to the 1956 baseball season. The defending champion Dodgers threatened a runaway by winning the first two games at Ebbets field.

Sal Maglie, magnificent in the clutch for Brooklyn during the regular season, tamed the Yankees and Whitey Ford in the opener, 6 to 3. Maglie gave up nine hits and struck out 10. He surrendered a two-run homer to Mickey Mantle in the first inning but Brooklyn, aided by Jackie Robinson's home run, tied the score at 2-2 in the second. Gil Hodges' three-run blast decided

the game for the Dodgers in the third inning.

In the second game the Yankees piled up a 6 to 0 lead but were defeated by a final margin of 13 to 8. New York scored once in the first inning and added five runs in the second, with four runs resulting from Yogi Berra's grand slam homer off Don Newcombe. But Yankee starter Don Larsen failed to hold the advantage. In the Brooklyn second, an error by first baseman Joe Collins paved the way for six unearned Dodger runs, the last three on Duke Snider's tenth series home run. Hodges' two-run double in the fourth put the Dodgers ahead to stay. The winner in a sterling relief job, was Don Bessent. Another relief pitcher Tom Morgan, suffered the loss.

When the teams switched to Yankee stadium for the third game, the tide of battle changed. Manager Casey Stengel of the Yankees came back with Ford in a desperation move while Walter Alston, the Brooklyn pilot, countered with Roger Craig. The Dodgers led, 2 to 1, going into the Yankee sixth, but 40-year-old Enos Slaughter ruined Craig's plans with a three-run homer. New York went on to win, 5 to 3.

Tom Sturdivant kept the revived Yankees rolling in the fourth game with a six-hit, 6 to 2 victory. A key single by Billy Martin off loser Carl Erskine helped the Yankees snap a 1-1 tie with two runs in the fourth inning. Mantle and Hank Bauer homered subsequently to provide insurance runs for Sturdivant. The series was now tied.

The fifth game belonged to Larsen and the Yankees, 2 to 0, but the Dodgers refused to be counted out.

In the sixth game, Brooklyn returned to Ebbets field and knotted the series at three games apiece. Clem Labine, normally a bullpen pitcher, outduelled Bob Turley, 1 to 0, in 10 innings. Turley allowed only four hits but lost out when Slaughter, in left field, misjudged Robinson's sinking line drive in the bottom of the tenth. Robinson's blow, which was scored as a single, brought Junior Gilliam home from second base. Labine posted a seven-hitter.

Brooklyn sent Newcombe against 23-year-old Johnny Kucks in the seventh and final game and the Yankees made a shambles of it, 9 to 0. Kucks brilliantly held the Dodgers at bay on three hits. Yogi Berra doomed Newcombe hurriedly with a two-run homer in the first inning and another homer in the third. When Elston Howard also homered off Newcombe in the fourth, the towering right-hander was removed, thus deprived of a possible series win for the fifth time in as many starts. Bill Skowron completed the rout in the seventh inning when he slammed a bases-loaded homer off Craig.

New York thus gained its revenge over Brooklyn and won the series for the sixth time in eight years.

Individually, Berra showed the way for the Yankees with a .360 batting average. The durable catcher also drove in a series record total of 10 runs. Slaughter, purchased by the Yankees from Kansas City on Aug. 25, followed Berra with an average of .350.

Snider and Hodges set the pace for Brooklyn with .304. The Dodgers batted .195 as a team, however, collecting only one run and seven hits in the final three games.

Attendance for the seven games was 345,903 and the net receipts were \$2,173,254.59. The Yankees voted 32 full shares worth \$8,714.76. The Dodgers voted 28 full shares worth \$6,934.34 to become the richest series losers in history.

Individual Performances.—Mickey Mantle of New York won the triple crown of batting in the American league. Mantle hit 52 home runs, 8 shy of Babe Ruth's record 60, and drove in 130 runs while compiling an average of .353. Ted Williams of Boston hit .345.

In pitching, Whitey Ford of New York led earned run averages with 2.47. His record was 19-6. The 20-game winners included

Frank Lary (21-13) and Billy Hoelt (20-14) of Detroit; Billy Pierce (20-9) of Chicago; and Herb Score (20-9), Early Wynn (20-9) and Bob Lemon (20-14) of Cleveland. Mel Parnell of Boston pitched a no-hit, no-run 4 to 0 victory over Chicago on July 14.

Milwaukee's Hank Aaron won the National league batting title with .328. Brooklyn's Duke Snider topped the home run parade with 43 while Stan Musial of St. Louis led in runs batted in with 109.

Dale Long of Pittsburgh broke a major league record by hitting home runs in eight consecutive games from May 19 through May 28.

The earned run leader among National league pitchers was Lew Burdette of Milwaukee, with a 2.71 average on a record of 19-10. Brooklyn's Don Newcombe was the big winner with 27-7. Warren Spahn (20-11) of Milwaukee and Johnny Antonelli (20-13) of New York were the only other 20-game winners.

Brooklyn pitchers Carl Erskine and Sal Maglie accounted for both National league no-hitters. Erskine got the second no-hitter of his career when he beat the Giants, 3 to 0, on May 12. Maglie waited until Sept. 25 to no-hit the Philadelphia Phillies, 5 to 0.

All-Star Game.—The National league defeated the American league, 7 to 3, to capture the 23rd annual All Star game at Griffith stadium in Washington, D.C., on July 10. It was the 10th victory for the Nationals against 13 reverses. Each club totalled 11 base hits, but the National league ran up a 5 to 0 lead, then beat back a three-run uprising in the sixth inning that featured home runs by Ted Williams and Mickey Mantle. Willie Mays and Stan Musial both homered for the Nationals. Third baseman Ken Boyer of the National league stood out defensively and also contributed three hits. The National league line-up at the outset included five members of the Cincinnati Redlegs. The winning pitcher was Bob Friend, who started against Billy Pierce, the loser. The game attracted 28,843 patrons.

Managerial Changes.—The lone managerial change in the majors during the season came on June 16, when Charley Grimm resigned as Milwaukee manager. Fred Haney, a coach with the Braves, took over for Grimm.

Upon conclusion of the season, the Chicago Cubs underwent a drastic shake-up. Manager Stan Hack, personnel director Wid Matthews and business manager Jim Gallagher all resigned. Bob Scheffing, who had managed the Cubs' affiliate at Los Angeles, became field manager; John Holland, president of the Los Angeles club, and Charley Grimm were named Cubs' vice-presidents. Another Cub's vice-president, Clarence Rowland, was named president at Los Angeles. Meanwhile, manager Al Lopez resigned at Cleveland and took a similar post with the White Sox when Marty Marion left Chicago. Kerby Farrell was named manager for Cleveland. Another postseason change found Detroit replacing manager Bucky Harris with Jack Tighe, who had coached under Harris.

Player Deals.—One of the key transactions of the 1956 season, as matters developed, came on May 15 when Cleveland received waivers on pitcher Sal Maglie, who then joined Brooklyn and aided immeasurably in the Dodgers' pennant

rush. Maglie won 13 of 18 decisions.

Among the multiplayer trades, the St. Louis Cardinals sent pitchers Harvey Haddix, Stu Miller and Ben Flowers to Philadelphia on May 11 for pitchers Herman Wehmeier and Murry Dickson. On June 14, the Cardinals traded second baseman Red Schoendienst, outfielder Jackie Brandt, catcher Bill Sarni and pitcher Dick Littlefield to the Giants for shortstop Alvin Dark, outfielder-first baseman Whitey Lockman, catcher Ray Katt and pitcher Don Liddle.

The White Sox, on May 21, got pitcher Jim Wilson and outfielder-first baseman Dave Philley from Baltimore in exchange for third baseman George Kell, outfielder Bob Nieman and pitcher Mike Fornieles.

Attendance.—As a result of its tight pennant race, the National league enjoyed an increased attendance of 960,398 over 1955. The final count for 1956 was 8,634,810. Milwaukee topped the 2,000,000 mark for the third straight year. The American league fell off 1,058,913 from 1955 to a total of 7,884,058, principally because of the Yankees' runaway.

Table II.—Attendance at Major League Baseball Parks, 1956

Club	1956	1955	Club	1956	1955
National league			American league		
Milwaukee . . .	2,046,331	2,005,836	New York . . .	1,491,594	1,490,138
Brooklyn . . .	1,199,775	1,033,589	Boston . . .	1,137,158	1,203,200
Cincinnati . . .	1,123,860	693,662	Detroit . . .	1,047,045	1,181,838
St. Louis . . .	1,029,773	849,130	Kansas City . .	1,015,154	1,393,054
Pittsburgh . . .	949,878	469,397	Chicago . . .	1,000,827	1,175,684
Philadelphia . .	935,808	922,886	Baltimore . . .	901,201	852,039
Chicago . . .	720,118	875,800	Cleveland . . .	859,557	1,221,780
New York . . .	629,267	824,112	Washington . .	431,522	425,238

Source: The Sporting News, the National Baseball Weekly.

The Minor Leagues.—Table III reveals the pennant and play-off winners in the minor baseball leagues during 1956. (J. BE.)

Boys' Baseball.—Tom Jordan, Jr., pitched and batted the Roswell (N.M.) nine to the title in the 1956 Little League world series at Williamsport, Pa. With 12,000 watching the final on Aug. 24, Jordan hit a home run with two on bases in the fourth inning to give his team a 3-1 victory over Delaware Township, N.J. Jordan fanned 14 batters and allowed two hits in the 6-inning game. Winchester, Mass., beat Colton, Calif., 2-1, in the consolation contest. Trenton, N.J., captured the championship of the Babe Ruth league series at Portland, Ore., winning over Huntington Park, Calif., 1-0.

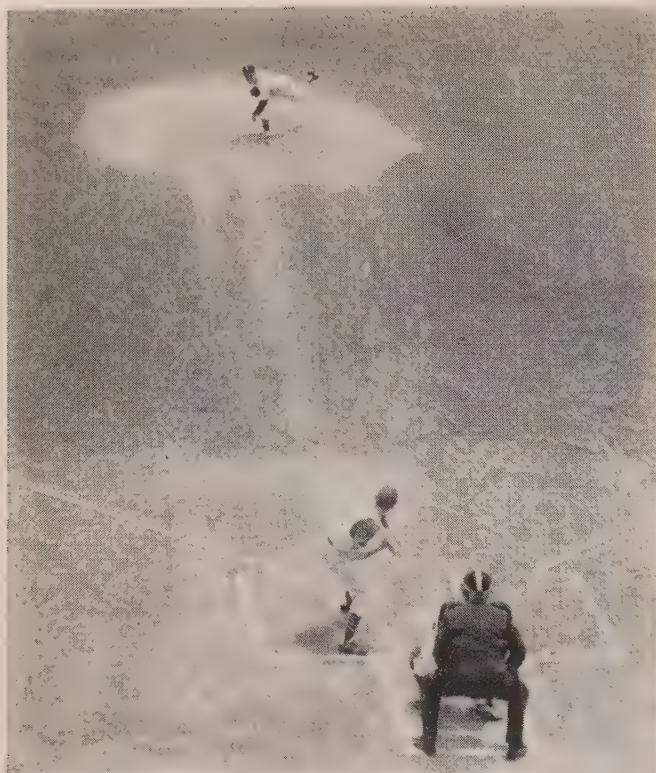
Joliet, Ill., came out on top in the double elimination tourney of the Pony (Protect Our Nation's Youth) league at Washington, Pa. Ed Stonich, gaining his second victory in the series,

Table III.—Final Minor League Winners, 1956

Class	League	Finished first	Parent club	Won play-offs	Position	Parent club
Open	Pacific Coast league	Los Angeles	Chicago N.L.	No play-offs		
AAA	American association	Indianapolis	Cleveland	Indianapolis	1	Cleveland
	International league	Toronto	Independent	Rochester	2	St. Louis
AA	Mexican league	Mex. City Reds	Independent	No play-offs		
	Southern association	Atlanta	Milwaukee	Atlanta	1	Milwaukee
	Texas league	Houston	St. Louis	Houston	1	St. Louis
A	Eastern league	Schenectady	Philadelphia	Schenectady	1	Philadelphia
	Sally league	Jacksonville	Milwaukee	Jacksonville	1	Milwaukee
	Western league	*Lincoln	Pittsburgh	Lincoln	1-2	Pittsburgh
B	Big State league	Corpus Christi	Milwaukee	Port Arthur	tied 2	Cleveland
	Carolina league	High-Pt.-Thomasville	Cincinnati	Fayetteville	4	Cleveland
	Northwest league	†Yakima	Independent	No play-offs		
	Southwestern league	Hobbs	Washington	El Paso	2	Independent
	Three-I league	†Evansville	Milwaukee	No play-offs		
C	Arizona-Mexico league	*Cananea	Independent	Cananea	1-5	Independent
	California league	Fresno	St. Louis	Fresno	1	St. Louis
	Central Mexican league	Saltillo	Independent	No play-offs		
	Evangeline league	Lafayette	Chicago N.L.	Final play-offs cancelled		
	Northern league	Eau Claire	Milwaukee	Duluth-Superior	3	Chicago A.L.
	Pioneer league	Boise	Milwaukee	No play-offs		
D	Alabama-Florida league	Croceville	Independent	Donalsonville	2	Independent
	Florida State league	†Cocoa	New York N.L.	No play-offs		
	Georgia-Florida league	†Valdosta	Detroit	No play-offs		
	Georgia State league	†Douglas	Cincinnati	Douglas	1-1	Cincinnati
	Midwest league	*Paris	Chicago N.L.	Paris	1-3	Chicago N.L.
	Nebraska State league	Lexington	Boston	No play-offs		
	Pony league	Wellsville	Milwaukee	Wellsville	1	Milwaukee
	Sooner State league	Ardmore	St. Louis	Seminole	3	Kansas City

*Lincoln, Cananea and Paris each won first-half titles and defeated Amarillo, Yuma and Dubuque, respective second-half winners, in play-offs. †Won both halves of split season.

Source: The Sporting News, the National Baseball Weekly.



FIRST PITCH of the 1956 All-Star game, Johnny Temple of the Cincinnati Redlegs waiting for the delivery by Billy Pierce of the Chicago White Sox

clinched the title by halting Hamtramck, Mich., 9-1. Jim Bradley of Hamtramck had hurled the first no-hitter in Pony series history in blanking New Brunswick, N.J., 1-0, in a semi-final. The American Legion junior tournament at Bismarck, N.D., was won by Stockham Post of St. Louis, Mo. The post, which had competed every season since 1926, gained the crown by conquering New Orleans, La., 8-3, in the last round. Tacoma, Wash., routed East Chicago, Ind., 10-0, at Battle Creek, Mich., to win American Amateur Baseball congress honours. Gloucester City, N.J., beat Gastonia, N.C., 9-0, in the National teenagers' tourney sponsored by the Veterans of Foreign Wars.

College Baseball.—Minnesota routed Arizona, 12-1, at Omaha, Neb., to take the National Collegiate Athletic association title. The victors compiled a record of 5 decisions and 1 setback in the double elimination series, Arizona having a 4 and 2 mark. Yale won the Big Three and Eastern (Ivy) crowns.

Other major college champions of 1956 included the following:

Southeast—Florida
Southern—George Washington
Atlantic Coast—Duke
Western (Big Ten)—Minnesota
Interstate—Illinois Normal
Mid-American—Ohio University
Missouri Valley—Bradley
Illinois—Illinois Wesleyan
Yankee—New Hampshire

Central I.A.C.—Maryland State
Midwest—St. Olaf
Mountain States—Wyoming
Border—Arizona
Pacific Coast—Washington State
Big Seven—Oklahoma
Southwest—Texas Christian
Mason-Dixon—Hampden-Sydney
California I.B.A.—So. California
(T. V. H.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Catching in Baseball* (1947); *Fence Buster* (Babe Ruth) (1956); *Hitting in Baseball* (1947); *King of Diamonds* (Lou Gehrig) (1956); *Mr. Baseball* (Connie Mack) (1956); *Throwing in Baseball* (1947).

Basketball. The University of San Francisco Dons won the National Collegiate Athletic association championship play-offs in the 1955-56 season by defeating the University of Iowa, Western conference title winner, 83-71, at McGaw Memorial hall, Evanston, Ill. The triumph capped an unbeaten campaign for the Dons and marked their 55th straight victory,

surpassing the former intercollegiate record of 39 straight decisions shared by Seton Hall university and Long Island university. San Francisco, led by its 6 ft. 10 in. centre Bill Russell who made 26 points in the game, overcame an early 15-4 Iowa lead to go ahead 38-33 at the half and was never overtaken. In the consolation contest, Temple downed Southern Methodist, 90-81, as Hal Lear of the victors scored 48 points, a N.C.A.A. championship game record. The 29 games of the tournament drew a record total of 132,513 spectators.

Russell proved the most popular selection ever in United Press polling for the All-America team. Rounding out the first quintet were Robin Freeman, Ohio State; Si Green, Duquesne; Darrel Floyd, Furman and Tom Heinsohn, Holy Cross.

The National Association of Intercollegiate Athletics (N.A.I.A.) tourney for small colleges at Kansas City, Mo., was won by McNeese State college of Lake Charles, La., with a 60-55 victory over Texas Southern of Houston, Tex. In the consolation game for third place, Pittsburg (Kan.) State halted Wheaton (Ill.) college, 77-70. North Carolina State, after tying North Carolina for first place in regular-season play in the Atlantic

BILL RUSSELL sinking a basket in the semifinal game of the National Collegiate Athletic association tournament at Chicago, Ill., March 22, 1956. Russell's team, the University of San Francisco Dons, beat Southern Methodist university 86-68



Coast conference, captured the title for the third successive season by beating Wake Forest (N.C.), 76-64, in the last round of the conference tourney. The annual national invitation tournament at New York's Madison Square Garden was captured by the University of Louisville. The Kentuckians, paced by Charlie Cyra's 27 points, defeated Dayton (Ohio) 93-80 in the final. St. Joseph's of Philadelphia, Pa., topped St. Francis of Brooklyn, 83-82, in the third-place contest.

Other major tournament champions included San Francisco (New York holiday festival); Tulsa (all-college at Oklahoma City); Iowa State (Big Seven at Kansas City); North Carolina State (Dixie classic at Raleigh, N.C.); Clemson (Gator Bowl at Jacksonville, Fla.); Brigham Young (Motor City classic at Detroit, Mich.); West Virginia (Orange Bowl at Miami Beach, Fla.); Cincinnati (Richmond, Va., invitation); Southern Methodist (Southwest conference at Houston, Tex.); Notre Dame (Sugar Bowl at New Orleans); George Washington (Winter invitation at College Park, Md.). The West's All-Stars routed the East, 103-72, in the 10th New York Herald-Tribune Fresh Air Fund game at Madison Square Garden before a crowd of 17,852. The West also won the 5th annual Shrine benefit contest at Kansas City, 74-62.

Among the major college league champions of 1956 were the following:

Eastern (Ivy)—Dartmouth (Hanover, N.H.)
Southeastern—Alabama (University, Ala.)
Southern—West Virginia (Morgantown, W.Va.)
Atlantic Coast—North Carolina State (Raleigh, N.C.)
Western (Big Ten)—Iowa (Iowa City, Ia.)
Big Seven—Kansas State (Manhattan, Kan.)
Missouri Valley—Houston (Houston, Tex.)
Mid-American—Marshall (Huntington, W.Va.)
Midwest—Coe (Cedar Rapids, Ia.)
Interstate—Western Illinois State (Macomb, Ill.)
Mountain States (Skyline)—Utah (Salt Lake City, U.)
Border—Texas Tech. (Lubbock, Tex.)
Pacific Coast—U.C.L.A. (Los Angeles, Calif.)
Southwest—Southern Methodist (Dallas, Tex.)
Rocky Mountain—Idaho State (Pocatello, Ida.)
Ohio Valley—Morehead State (Morehead, Ky.)
Yankee—Connecticut U. (Storrs, Conn.)
Central I.A.A.—Maryland State (Princess Anne, Md.)

Professional Basketball.—The Philadelphia Warriors annexed the National association championship by conquering the Ft. Wayne (Ind.) Pistons in the final series. Play-off results follow:

Eastern semifinals
Boston 110, Syracuse 93
Syracuse 101, Boston 98
Boston 102, Boston 97

Western semifinals

St. Louis 116, Minneapolis 115
Minneapolis 133, St. Louis 75
St. Louis 116, Minneapolis 115

Eastern finals

Philadelphia 109, Syracuse 87
Syracuse 122, Philadelphia 118
Philadelphia 119, Syracuse 96
Syracuse 108, Philadelphia 104
Philadelphia 109, Syracuse 104

Western finals

St. Louis 86, Ft. Wayne 85
St. Louis 84, Ft. Wayne 74
Ft. Wayne 107, St. Louis 84
Ft. Wayne 93, St. Louis 84
Ft. Wayne 102, St. Louis 97

All-championship finals

Philadelphia 98, Ft. Wayne 94
Ft. Wayne 84, Philadelphia 83
Philadelphia 100, Ft. Wayne 96

Bob Pettit of the St. Louis Hawks, the league's top scorer, Paul Arizin and Neil Johnston of the Warriors and the Boston Celtics' Bob Cousy and Bill Sharman were chosen for the 1956 All-league first five. In the East-West All-Star contest on Jan. 24 at Rochester, N.Y., the West won by 108-94.

Amateur Athletic Union Basketball.—The 1956 title tournament, at Denver, Colo., March 19-24, drew a field of 26 A.U. teams. Seattle's Buchan Bakers won the title, the result of a 59-57 last-second victory over the defending champion Phillips 66 Oilers of Bartlesville, Okla., in the final. The Bakers reached the final round by eliminating the Allen-Bradley five of Milwaukee, 85-75, while Phillips advanced by topping the Adair Oilers of Mobile, Ala., 71-69. The Phillips five, which earlier in the campaign retained its National Industrial League honours, also placed first in the final Olympic trials at Kansas City, April 24. After losing to the Armed Forces All-Stars, 78-77, the Phillips men came back to beat the Buchan Bakers, 72-64, and



SOVIET GIANT, Vasily Akhtayev, 7 ft. 6½ in. tall, towering over his teammates and opponents during a 1956 basketball game in Moscow

the College All-Stars, 79-75. The Phillips team placed Chuck Darling, Burdette Haldorson, Bob Jeangerard, Bill Hougland and Jim Walsh, with Joe Dean among the alternates, on the U.S. Olympic squad that also included Bill Russell and K. C. Jones of San Francisco U.

The Wayland Flying Queens of Plainview, Tex., annexed the women's national A.A.U. title for the third successive year, beating the Nashville (Tenn.) Business College club, 39-33, in the final at St. Joseph, Mo., March 15. Elizabeth, N.J. won national Y.M.C.A. honours.

(T. V. H.)

ENCYCLOPEDIA BRITANNICA FILMS.—*Ball Handling in Basketball* (1946); *Defensive Footwork in Basketball* (1946); *Mr. Basketball* (George Mikan) (1956); *Shooting in Basketball* (1946).

Basutoland: see BRITISH SOUTH AFRICAN TERRITORIES.

Bauxite: see MINERAL AND METAL PRODUCTION AND PRICES.

Bechuanaland Protectorate: see BRITISH SOUTH AFRICAN TERRITORIES.

Beef: see MEAT.

Beer: see BREWING AND BEER.

Behavioral Sciences. By 1956 the term "behavioral sciences" had gained wide usage in the United States and was beginning to be employed by English and European scientists. Rarely used before World War II, by 1951 when the Ford foundation began its large philanthropic work the term was chosen to name one of the five major fields of the foundation's activity—the Behavioral Sciences program. In July 1952 it appropriated funds to establish the Center for Advanced Study in the Behavioral Sciences, which began operations in Sept. 1954. In 1953 a book was published on research methods in the behavioral sciences, while in Jan. 1956 a new scientific journal called *Behavioral Science* was founded by the Mental Health Research institute of the University of Michigan, Ann Arbor.

This rapid acceptance of a new term reflects two characteristics of the contemporary scientific study of man: its increasing focus upon human behavior, and the multiplicity of scientific fields concerned. Philosophy and the arts have always centred their attention upon man, but science with its emphasis upon

objectivity and public verification of its generalizations began with the study of nonliving things, then applied its methods of observation and thought to plants and animals. When man became a subject of scientific study, the focus was upon his anatomy and physiology. In the past half-century, however, man's behavior, that is, his ways of thinking, feeling and acting, has become a major subject of investigation by a variety of sciences, such as anthropology, ecology, economics, geography, history, linguistics, neurology, pharmacology, physiology, political science, psychiatry, psychology and sociology. But since each of these fields has evolved its own methods and concepts and its own specific focus of attention, little synthesis of the knowledge about human behavior has resulted. World War II witnessed an acute demand for comprehensive knowledge of man, and efforts at collaboration among several scientists were begun. By 1956, many behavioral scientists in different fields were actively sharing common methods of investigation, concepts for analyzing and summarizing data and generalizations.

Earlier studies were largely descriptive, reporting and summarizing observations of human activity. Recently more effort has been devoted to explanation—the conditions affecting behavior and possible causes—the “how” and “why” of man's reactions. Interest is also developing in the use of mathematics and systematic logic in seeking more precise formulations of relations among factors involved in human behavior, particularly in cause-and-effect relations. Mathematicians, logicians and statisticians are collaborating with behavioral scientists in constructing models to guide investigation and analysis. There is also a growing collaboration between scholars who lean heavily upon personal experience and perspective in interpreting human action, thought and feeling (creative writers, some philosophers and some historians) and scientists who rely more largely for interpretation on explicitly defined methods of analysis and synthesis (psychologists and sociologists, for example). The name “behavioral sciences” symbolizes the current evolution in the study of man.

Unlike the earlier “behaviorism,” the term “behavioral sciences” has not become the name of a special system but is the designation of a broad area of scientific inquiry. (R. W. Tr.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Emergence of Personality* (series of 5 films) (1948); *Mental Health* (Keeping Mentally Fit) (1952); *Personality and Emotions* (1955); *Why Vandalism?* (1955); *Your Children's Sleep* (1950); *Yale Clinic Child Development* (series of 11 films) (1934).

Belgian Colonial Empire. The Belgian colonial empire consists of the colony of the Congo in central Africa and the adjacent trust territories of Ruanda and Urundi administered with the Congo. Total area: 925,733 sq.mi. Total pop. (1954 est.) 16,674,860. Areas, populations, capital towns, status and governors of the separate territories are given in the table.

Belgian Colonial Empire					
Country	Area (In sq.mi.)	Population (1954 est.)	Capital	Status	Governor
Belgian Congo	904,991	Africans 12,317,300 Europeans 86,688 (incl. 67,827 Belgians)	Léopoldville	Colony	Léo Pétillon, governor general
Ruanda- Urundi	20,742	Africans 4,261,900 Europeans 5,559 (incl. 4,110 Belgians) Others 3,413	Usumbura*	{Sultanates, trust terri- tories}	Claeys-Bouvaert, governor

*Principal town of Ruanda, Kigali; principal town of Urundi, Kitega.

History.—The Belgian administration in the colony of the Congo and in the trust territories of Ruanda and Urundi continued in 1956 the policy of promoting social security and of training the native people toward self-government. Two decrees were drafted concerning organized labour in the Congo. Trade unions would have to obtain recognition by the Belgian authorities and would be established as corporate bodies. The right to join a trade union, and the eventual existence of several union



MODERN ARCHITECTURE in the Belgian Congo, a 1956 home at Manono designed to give maximum protection from the sun, wind and rain

movements, as was the case in Belgium, were admitted. In the public services, however, strikes remained forbidden. In private enterprises they were permitted when all existing means for compromising had failed.

In Ruanda and Urundi the native male population for the first time went to the polls in October for the election of local councilors. Out of 900,000 registered electors, more than 700,000 took part in the vote. White colonists were not allowed to vote but some of them were elected, which indicated the spirit of co-operation between Europeans and Africans.

The new hydroelectric power station on the upper Lualaba river, near Zilu, was inaugurated in August. It was the biggest in central Africa. In August the railway section between the military base at Kamina, in the Katanga province, and Kabalo was opened. The new railway was the shortest connection between the Katanga mining region and Dar es Salaam, Tanganyika, where in October new port installations were inaugurated by Princess Margaret. By virtue of the 1921 Anglo-Belgian agreement, the Belgian Congo enjoyed freedom of transit between the Belgian base and Dar es Salaam.

(M. H. St.)

Finance.—Monetary unit: Congolese franc, nominally an independent currency, actually at par with the Belgian franc. Budgets (1956 est.): *Congo*: revenue (ordinary) 10,224,793,000 fr., (extraordinary) 411,176,000 fr.; expenditure (ordinary) 10,221,326,000 fr., (extraordinary) 8,695,824,000 fr. *Ruanda-Urundi*: revenue (ordinary) 647,108,000 fr., (extraordinary) 408,330,000 fr.; expenditure (ordinary) 746,262,000 fr. (extraordinary) 746,046,000 fr.

Foreign Trade.—(1955) Imports 18,951,000,000 fr.; exports 22,703,000,000 fr.; gold exports (1954) 634,000,000 fr.

Transport and Communications.—Roads (1952) 128,253 km. Motor vehicles in use (*Congo*, 1954): passenger 24,015, commercial (including buses) 23,174. Railways (1953) 4,762 km. Waterways (1953) 18,961 km. Telephones (Jan. 1955) 13,604.

Agriculture.—Production: *Congo* (metric tons, 1955; 1954 in parentheses): palm oil 235,000 (225,000); palm kernel oil 60,000 (54,700); cottonseed 100,000 (96,000); rubber (exports) 26,040 (22,560); lint cotton, 50,000 (48,000); coffee (including *Ruanda-Urundi*) 41,100 (37,300); peanuts 188,000 (180,000); sweet potatoes and yams (1954) 343,000 (309,000 in 1953); cassava (1954) 6,785,000 (6,751,000 in 1953); timber products (cu.m., 1954) logs 755,887, sawn wood 254,141, pitwood 2,069,991. *Ruanda-Urundi* (metric tons, 1954; 1953 in parentheses): cassava 2,040,000 (1,805,000); sweet potatoes and yams 1,964,000 (1,442,000); dry beans 264,000 (334,000).

Industry.—Production (metric tons, 1955): coal 479,925; copper, smelter (*Congo*, exports) 230,880; zinc, smelter (*Congo*, exports) 33,240; tin concentrates, metal content, 15,480; tin, smelter (*Congo*) 2,880; cobalt ore 8,227; manganese ore 461,732; tungsten ore 311; gold 11,359 kg.; diamonds 12,413,199 carats.

ENCYCLOPÆDIA BRITANNICA FILMS.—*A Giant People* (the Watuusi) (1939); *People of the Congo* (the Mangbetu) (1939); *Pygmies of Africa* (1939).

Belgian Congo: see BELGIAN COLONIAL EMPIRE.

Belgium. A kingdom of western Europe, Belgium is bounded southwest by France, north by the Netherlands and east by Germany and Luxembourg. Area: 11,779 sq.mi. Pop.: (1947 census) 8,512,195; (1955 est.) 8,868,000. Language (1954 est.): Flemish (Dutch) 50%; French 34%; Flemish and French 15%; German 1%. Religion: mainly Roman Catholic. Chief towns (pop., 1952 est.) Brussels (cap.) 180,771; Antwerp 261,-

405; Liège 156,728; Ghent 164,713; Bruges 51,924. Ruler, King Baudouin I; prime minister in 1956, Achille van Acker.

History.—In Feb. 1956 King Baudouin attended at Ghent a ceremony commemorating the 25th anniversary of the Flemish university and was given an honorary doctorate.

A national tribute was paid to Queen Elisabeth, grandmother of the king, on her 80th birthday. In all cities and villages money was collected for a Queen Elisabeth foundation to promote the philanthropic and cultural institutions in which she was interested.

On Sept. 24, on the occasion of Chancellor Konrad Adenauer's visit to Brussels, a series of agreements was signed by Heinrich von Brentano, foreign minister of the German Federal Republic, and Paul Henri Spaak, the Belgian foreign minister. The main agreement concerned frontier adjustments. Some enclaves had been transferred to Belgium in 1949 after a decision of the Council of Foreign Ministers and it was now decided that Belgium would return to Germany the villages of Bildchen, Leykoul, Losheim and Hemmeres together with the forests of Freyen and Bullingen, whereas Germany would assign the forests of Wahlen-scheid and Losheimergraben to Belgium. The adjustments were intended to facilitate traffic arrangements and local administration and no transfer of population was involved. Both Adenauer and Spaak expressed satisfaction at the result of the negotiations and said that the adjustments were final.

Delegates of the Supreme Soviet visited Belgium in May and in October Van Acker and Spaak paid an official visit to Moscow where on Oct. 25 a cultural agreement was signed providing for the exchange of professors, teachers, students, members of cultural institutions and scientists.

On Nov. 8, because of the Soviet armed intervention in Hungary, the government informed Moscow that the agreement would not enter into operation.

At the end of January Paul van Zeeland, a Christian Social senator and former prime minister, decided to leave politics and joined a banking group. In February Oscar Bossaert, a Liberal member of the senate and the first minister of the middle classes, died from a heart attack. He was succeeded as a minister by Léo Mundeeler, a Liberal member of the chamber of deputies.

During the whole year the problem of "Euratom," the Atomic Energy authority for the six member countries of the European Coal and Steel community, and of a European common market were discussed by experts in Brussels under the chairmanship of Spaak. At the end of the year negotiations were proceeding for the drafting of appropriate treaties. The main difficulties came from the French concern about possible trouble during the transition period from the French protectionist system to an open market.

Great importance was attached to the improvement of the Antwerp port installations and the widening of rivers and inland canals.

Economic activity was overshadowed by the mine disaster which occurred on Aug. 8 when in a pit of the Bois-du-Cazier colliery at Marcinelle, in the Hainault province, a derailed coal truck fell in a ventilating shaft, cutting an electric cable and causing a short circuit resulting in a fire which was extinguished only after 11 days. There were 262 victims among the miners.

Foreign trade and economic activity expanded throughout the year. The index of industrial production in September was 164.9 (1936-38=100) and 116.4 (1954=100). There was a shortage of skilled labour and the government had to take measures to counter inflation.

The government fixed the total strength of the armed forces for 1957 at 145,300 men: 115,100 in the army, 25,400 in the air force and 4,800 in the navy. In addition 38,746 men would

be available for the territorial anti-aircraft guard. Defense expenditure in 1957 would amount to 11,448,604,000 Belgian francs (\$228,972,080) as against 13,001,204,000 francs (\$260,024,080) in 1956. (See also EUROPEAN UNITY.) (M. H. St.)

Education.—Schools (1953-54); primary 8,745, pupils 826,328, teachers (1953) 37,574; secondary 783, pupils 199,229, teachers (state only) 9,879; vocational 2,437, pupils 247,740; teachers' training colleges (excluding post-secondary) 169, students 18,669. Institutions of higher education 23 (including 4 universities), students (1953-54) 22,647.

Finance and Banking.—Monetary unit: Belgian franc, with an average exchange rate of 49.88 to the U.S. dollar in March 1956. Budget (1955; 1956 est. in parentheses): revenue 81,730,000,000 fr. (85,325,000,000 fr.); expenditure 98,989,000,000 fr. (95,363,000,000 fr.). Total public debt (Dec. 1955) 332,873,000,000 fr.; external debt (1956) 22,305,000,000 fr. Gold and foreign exchange holdings (central bank, U.S. dollars, April 1955; March 1956 in parentheses) 1,046,000,000 (1,192,000,000). Currency circulation (Sept. 1955; Sept. 1954 in parentheses) 110,000,000,000 fr. (105,200,000,000 fr.). Deposit money (Sept. 1955; Sept. 1954 in parentheses) 80,600,000,000 fr. (73,600,000,000 fr.).

Foreign Trade.—(Belgium-Luxembourg economic union, 1955): imports 141,200,000,000 fr.; exports 138,200,000,000 fr. Main sources of imports: Germany 14%; Netherlands 13%; France 12%; other continental E.P.U. (European Payments' Union countries) 32%; E.P.U. dependencies 9%; sterling area 18%; U.S. and Canada 13%. Main destination of exports: Netherlands 21%; Germany 18%; other continental E.P.U. 18%; sterling area 13%; U.S. and Canada 12%.

Transport and Communications.—Roads (1953) 62,700 km. Motor vehicles in use (1954): passenger 418,000, commercial 178,000. Railways (S.N.C.B. and S.N.C.V., 1954) 7,923 km.; passenger-km. (S.N.C.B. only, 1954) 7,562,000,000; freight, ton-km. (S.N.C.B. only, 1955) 6,564,000,000. Shipping: merchant vessels of 100 gross tons and over (July 1955) 193; total tonnage 497,536. Navigable inland waterways (1955) 1,568 km. Air transport (1955): passenger-km. 578,772,000; cargo, ton-km. 26,232,000. Telephones (Jan. 1955) 830,405. Radio receiving sets (1954) 1,986,000.

Agriculture and Fisheries.—Production (metric tons, 1955; 1954 in parentheses): wheat 757,000 (589,000); barley 280,000 (247,000); oats 425,000 (452,000); rye 220,000 (245,000); potatoes 2,184,000 (2,634,000); flax fibre 44,900 (38,900); beet sugar (raw) 368,000; meat 368,400. Fish landings (1955) 69,504 metric tons.

Industry.—Fuel and power (1955): coal 29,712,000 metric tons; manufactured gas 2,076,000,000 cu.m.; electricity 11,196,000,000 kw.hr. Production (metric tons, 1955): pig iron 5,388,000; crude steel 5,904,000; copper, refined 156,960; lead, refined 82,800; zinc, smelter 213,120; tin, smelter 10,560; aluminum 2,412; cement 4,692,000; cotton yarn 107,520; cotton fabrics 74,100; wool yarn 41,640; woollen fabrics 28,452; rayon filament yarn 10,920; rayon staple fibre 21,000.

ENCYCLOPÆDIA BRITANNICA FILMS.—Belgium (1955).

Benefactions: see DONATIONS AND BEQUESTS.

Benelux: see BELGIUM; EUROPEAN UNITY; LUXEMBOURG; NETHERLANDS.

Benson, Ezra Taft (1899-), U.S. government official, was born on Aug. 4 in Whitney, Ida. He attended Utah State Agricultural college, Logan (1918-21); Brigham Young university, Provo, Utah; and Iowa State college, Ames. After spending several years farming in southern Idaho, he was employed as an agricultural agent by the University of Idaho extension service until 1930, when he was placed in charge of economics and marketing work for the state of Idaho. He held this position until 1937. He was executive secretary of the National Council on Farmer Cooperatives (1939-44) and was president of the Washington Stake, Church of Jesus Christ of Latter Day Saints, in Washington, D.C. (1940-44).

Benson was opposed to federal food subsidies and believed that they were a cause rather than a preventive of inflation; this view of federal aid for farmers gained him a number of political opponents in agricultural circles. Designated as secretary of agriculture by Pres. Dwight D. Eisenhower on Nov. 24, 1952, he took office on Jan. 21, 1953.

Benson's tenure in office was marked by his opposition to fixed 90% parity props for agricultural products and his advocacy of flexible supports ranging from 75% to 90% of parity. This policy earned him the enmity of large and influential agricultural groups, but he refused to modify his stand and was singled out by the Democrats as a special political target in 1955-56 on the issue of declining farm income. At his urging President Eisenhower on April 15, 1956, vetoed a farm bill containing fixed 90% supports, but signed a compromise bill May 28 which contained soil-bank provisions recommended by Benson. Prior to the na-

tional election of Nov. 1956 Benson made an extensive campaign tour to defend his farm program.

Benton, William (1900—), U.S. publisher and public official, was born on April 1 in Minneapolis, Minn. He was graduated from Yale university in 1921. In 1929, in partnership with Chester Bowles, he founded the advertising agency of Benton and Bowles.

Benton retired from the agency in 1936 and in 1937 became vice-president of The University of Chicago, where he served on a part-time basis until 1945. In 1942, in collaboration with Paul G. Hoffman, he helped to found the Committee for Economic Development, and he was active in inter-American affairs. At his instance The University of Chicago acquired Encyclopædia Britannica, Inc., in 1943. He financed the company, became publisher and chairman of its board and shared its ownership with the university. He launched the company into the classroom motion-picture field and served as chairman of Encyclopædia Britannica Films Inc.

Benton was appointed U.S. assistant secretary of state by Pres. Harry S. Truman on Aug. 31, 1945, and served until Sept. 30, 1947. He developed the country's first peacetime program of international information and educational exchange and took responsibility for U.S. participation in the United Nations Educational, Scientific and Cultural organization.

In Dec. 1949 Benton was appointed U.S. senator from Connecticut. In the election of Nov. 7, 1950, he was returned to the senate for two more years, but two years later he was defeated in his bid for a full six-year term. His three years in the senate were marked by his campaign in behalf of a "Marshall plan of ideas"; his vigorous espousal of the Hoover commission's recommendations on government reorganization; his resolution calling for expulsion of Sen. Joseph McCarthy of Wisconsin; and by adoption of the "Benton amendment" to the Mutual Security act.

In 1955 Benton, his wife and their son John travelled in the Soviet Union and some of the eastern European countries to study the impact of communist propaganda on the Russian and satellite peoples. His reports during 1956 on gains in Soviet education dramatized the "cold war of the classroom" as a factor in "competitive co-existence." Benton proposed establishment by the U.S. government of 100,000 college scholarships a year "to check the vast and tragic leakage of talent from our educational system."

Bequests, Philanthropic: see DONATIONS AND BEQUESTS.

Berlin. Capital of the German reich from 1871 to 1945, Berlin was still by 1956 the largest city of Germany. Area: 341 sq.mi. Pop.: (1939 census) 4,321,500; (1955 est.) 3,300,000. From June 6, 1945, Berlin was administered by an inter-Allied government authority consisting of the commandants of the four sectors of Berlin. After June 24, 1948, when the Soviet commandant proclaimed the dissolution of the authority, Berlin was in fact divided into two opposing administrations. By Dec. 31, 1956, the three western sectors (area, 186 sq.mi.; pop., 1950 census, 2,146,952; 1955 est., 2,100,000) were under the authority of the three following Allied commandants: Great Britain, Maj. Gen. R. C. Cottrell-Hill; United States, Maj. Gen. Charles L. Dasher; France, Brig. Gen. A. J. B. Gèze. In the Soviet sector (area, 155 sq.mi.; pop., 1946 census, 1,175,979; 1955 est., 1,200,000) Maj. Gen. P. A. Dibrova was military commander. There were also two rival German city governments and two lord mayors. Otto Suhr was *Oberbürgermeister* of western Berlin, appointed by an elected city assembly; Friedrich Ebert was *Oberbürgermeister* of the Soviet sector, appointed by the

Sozialistische Einheitspartei Deutschlands.

History.—The year 1956 was the most uneventful which the city of Berlin had experienced since World War II. Throughout the year western Berlin was a city of normality. Its traditional "occasions"—the Labour day rallies on May 1, the Day of National Unity on July 17 and the Trade fair celebrations—passed without serious incident. While steady progress was being made on the four-year plan for the reconstruction of the city and unemployment was dropping below 100,000 (August) for the first time since 1946, Berlin's communications with the German Federal Republic functioned normally. German motorists continued to pay the *Autobahn* dues, which were imposed on April 1, 1955 and revised on June 4, 1955, for the use of the road from Helmstedt to Berlin.

Probably the most important event which took place in Berlin was the Evangelical Church congress at the end of June. The Extraordinary Synod of the Evangelical Churches met alternately in eastern and western Berlin and discussed church policy for the whole of Germany. The synod decided to oppose conscription in western Germany and the creation of the 90,000-strong eastern German army. Members bitterly criticized the repression of religion in the German Democratic Republic, and the synod decided not to make the declaration of loyalty desired by the eastern German government. Finally, the synod asked for every possible step to be taken to secure German reunification.

Twice the eastern German government organized armed marches through the streets of eastern Berlin which were contrary to the city's four-power charter. The first occasion was on Jan. 15, and the western powers lodged a formal protest with the Soviet ambassador to the German Democratic Republic, G. M. Pushkin, on Feb. 10. The second occasion was on May 1, and the western powers protested on May 17. Persons taking part in these armed marches included members of the new eastern German armed forces, of the "factory guards" and uniformed people's police. In November more than 100,000 western Berliners

WIRE-TAPPING APPARATUS uncovered by Soviet authorities in east Berlin in 1956. It was claimed that about 300 telephones were affected; some of the underground equipment was marked "Made in U.S.A." and "Made in England"



demonstrated in front of the Brandenburg gate as a protest against Soviet armed aggression in Hungary.

On Oct. 1 former Adm. Karl Dönitz was released from the four-power prison of Spandau. This left only four of the "major" war criminals in Spandau. Of them, Rudolf Hess and Walter Funk were serving life sentences, and Albert Speer and Baldur von Schirach were serving sentences of 20 years' imprisonment. Dönitz refused to make any statement to the press after his release. He said, "I intend to remain silent now, and in the future."

On Feb. 6 the former Communist youth leader Robert Bialek, who fled to western Berlin in July 1953, was kidnapped and taken to eastern Germany. Bialek had been working for the western Berlin radio network. No effective protest was made, and nothing was known of his whereabouts. This was one of a number of kidnappings during 1956.

(See GERMANY.)

(T. PE.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Germany* (1955).

Bermuda. This British colony consists of 360 small islands (20 inhabited) 580 mi. east-south-east of Cape Hatteras, N.C. Area: 21 sq.mi., including 2.83 sq.mi. leased to the United States for naval and military bases. Pop.: (1950 census) 37,403, including 22,638 coloured and 14,724 Europeans; (1955 est.) 40,455. Language: English. Religion: Christian (about 55% Anglican). Chief towns (pop., 1955 est.): Hamilton (cap.), 3,000; St. George's, 1,550. Governor in 1956, Lieut. Gen. Sir John Woodall.

History.—Government revenue for 1956 was estimated at £2,866,257 and expenditure at £2,865,169. Tourism was again the principal industry; the number of tourists (110,651) visiting the colony in 1955 was a record, more than 104,000 being from the United States. The Bermuda Crown Lands corporation began the development of the former naval dockyard area at West End as an industrial area in conjunction with a free port; the corporation planned to spend £125,000 on rehabilitating buildings and £45,000 on refitting part of the dockyard for boat building. A Bill passed in July 1956 gave exempted companies and their shareholders tax immunity for up to 30 yr. As a result of this and of the free port facilities, an increasing number of British and other shipping companies registered subsidiaries in Bermuda.

(R. H. Y.)

Education.—Schools (1955): government maintained and aided, primary 9, pupils 7,461, teachers 288; secondary 9, pupils 788, teachers 68; technical and vocational 6, pupils 196, teachers 13; independent, primary 13, pupils 1,000, teachers 28; secondary 4, pupils 209, teachers 14; technical and vocational 1, pupils 16, teachers 1.

Finance and Trade.—Monetary unit: Bermuda pound, at par with sterling. Budget (1955 actual; 1956 est. in parentheses): revenue £2,895,302 (£2,866,257), expenditure £3,082,295 (£2,865,169). Foreign trade (1955): exports £13,400,000, imports £3,410,000. Main exports: cut flowers (lilies) and concentrates and essences.

Eryllium: see MINERAL AND METAL PRODUCTION AND PRICES.

Best Sellers: see BOOK PUBLISHING AND BOOK SALES.

Betting and Gambling. The amount of money risked on betting and gambling in the United States increased in 1956 over 1955, but this was attributable chiefly to opportunities that did not exist in 1955: the presidential election, and general use by newspapers of prize contests to increase circulation. Otherwise there was little or no increase except in betting on horse races.

Betting on the presidential election was unusually light. One bookmaking syndicate estimated the national total at about \$50,000,000, less than one third what might be expected in a close election. Backers of Adlai E. Stevenson demanded higher odds than the 6 or 7 to 1, or usually less, that were offered. Backers of Dwight D. Eisenhower were deterred by memory of the 1948 election, when the odds on Thomas E. Dewey went to 20 to 1 and losses on him were heavy.

The newspapers' circulation-building contests might be considered gambling only in a technical sense. The U.S. "lottery laws" (18 U.S. Code 1302) deny the use of the mails to a prize contest when the contestant must pay money or any other consideration to enter and when the result depends on chance "in whole or in part." Some newspapers offer prizes dependent wholly on chance, such as having a particular telephone number; others use games such as crossword puzzles purporting to be contests of skill. The latter have been ruled by the post office department to be sufficiently dependent on chance to violate the lottery laws, but through 1956 the post office had not refused the use of the mails to such contests. It was estimated that about 800 (or 50%) of the daily newspapers in the United States used contests of one kind or another during 1956. Estimates of the total amount spent by contestants to enter the contests varied greatly, from \$100,000,000 to \$300,000,000.

Legal betting through pari-mutuel machines at U.S. race tracks was about \$2,231,500,000 in 1956. Of this more than \$525,000,000 was on harness races, an increase of 5% over 1955; the remainder, bet on running races, represented an increase of only about 2%. The increase was attributed chiefly to increased attendance at race tracks, which reached 30,000,000 for the first time.

The play at the licensed gambling houses of Nevada decreased slightly. In New Jersey, which permits lotteries and bingo games as fund-raising mediums for charities and the like, there was an estimated increase of 25% over the 1955 figure of \$17,000,000 in funds realized for the beneficiaries. Total gambling in the state still declined, because of a ruling of the New Jersey supreme court that the games similar to bingo that for years had been played at shore resorts such as Atlantic City were a violation of the state's various antigambling statutes.

The U.S. internal revenue service estimated that the amount collected, at \$50 each, in annual taxes on professional gamblers would decrease at least 50% from the 1955 total of about \$9,500,000; but this was attributed more to general evasion of the tax than to a decrease in the number of persons liable.

(A. H. MD.)

Great Britain.—No marked change occurred in 1956 in expenditure on gambling in Great Britain as compared with 1955. The amount staked on football pools was estimated at £70,000,000, and on dog-track totalizators at £59,000,000. There was a small upward movement in the totalizator betting on horse races, and an increase to about £11,000,000 in the stakes placed in Irish Hospitals sweepstakes.

The Small Lotteries and Gaming act, 1956, received the royal assent in July. It originated as a private member's bill introduced by Ernest Davies in Nov. 1955. This act permitted the promotion of lotteries in which tickets might be sold to the public by societies which were established and conducted for charitable, sporting or cultural purposes, or for other purposes which were not purposes of private gain or of any commercial undertaking. Societies must register with the local authority, and must make to it returns giving particulars of lotteries which they promote. The conditions imposed on the conduct of a lottery promoted under the act included ones that the total value of tickets sold must not exceed £750, and that the amounts appropriated from the proceeds for expenses and prizes must not exceed 10% and 50% respectively.

The act also made lawful, subject to conditions, certain kinds of gaming parties conducted with the object of raising money for purposes other than private gain—the whist drive for charity (which for many years had not in practice been subject to prosecution) was a common example.

In his budget speech on April 17, the chancellor of the exchequer, Harold Macmillan, announced a plan for the sale of a new government security known as the "premium bond." No

interest would be paid on bonds, but holders would qualify for participation in a distribution according to chance of tax-free prizes from a prize fund amounting to 4% per annum of the amount invested. This scheme was strongly criticized by church leaders and other persons opposed to gambling. (See also HORSE RACING.) (H. W. Sv.)

Bhutan. An Indian-protected princely state in the Himalayas, Bhutan lies between India (Assam, south and east, and West Bengal, southwest), Tibet (north and northwest) and Sikkim (west). Area: about 19,305 sq.mi. Pop. (1955 est.): 623,000, mainly Bhutane, Bhotias or Duk-pa of Tibetan origin (*Bhot*=Tibet); also many Nepalese in the south. Language: a Tibetan dialect.

Religion: Duk-pa Buddhism, a crude unreformed Lamaism. Capitals: Punaka (winter) and Tashi-Cho-dzong (summer). Maharaja, Jigme Dorji Wangchuk.

History.—In May 1956 a delegation from Bhutan attended King Mahendra's coronation at Kathmandu, Nepal. It was headed by Jigme Dorji, 37-year-old brother-in-law of the Bhutanese ruler and his closest adviser. "We have begun to sow a few seeds of democracy," said Jigme Dorji to foreign correspondents. The maharaja of Bhutan set up a central advisory council composed of elders elected by the villages. It was also decided to build up an educational system and later invite foreign assistance in the administration of the country's economy. The 1956 budget amounted to about Rs. 3,000,000, including the Indian subsidy of Rs. 500,000 a year.

Economy.—Annual subsidy from India, Rs. 500,000; annual trade with India, about Rs. 776,000. Chief products: rice, Indian corn, millet, timber. Livestock: elephants, ponies. Chief manufactures: fine swords, muzzle-loading muskets, fly whisks (chowries), lac, wax, cloth, musk.

Bicycling: see CYCLING.

Billiards. Willie Mosconi of Philadelphia, Pa., regained the world pocket-billiards championship he had lost to Irving Crane of Rochester, N.Y. in April 1955, and then went on to dominate competition in 1956. In a week-long match at Allingers' in Philadelphia, Nov. 26–Dec. 2, 1955, Mosconi triumphed over Crane, 1,500–676. He then turned back Jimmy Caras of Upper Darby, Pa., in what was billed as a world championship challenge match of 10 blocks played in six cities. Mosconi established a new record in the sixth block of the match at Chicago, Ill., Feb. 16, 1956, when he defeated Caras, 150 to minus 1, running 151 balls in the second inning to break his own previous record of 150 for championship play. The two-inning triumph also tied a mark held jointly by Mosconi and George Chenier of Canada.

In the world pocket-billiards championship tournament held in April 1956 at Kingston, N.C., Mosconi again demonstrated his prowess and became the first man in the history of the competition to triumph in all 14 of his matches. The undefeated titleholder climaxed his performance by shutting out Jimmy Moore of Albuquerque, N.M. Mosconi ran 150 balls from the break to win, 150–0, in one inning and set up another tourney record.

Arthur Rubin won the metropolitan New York three-cushion championship by defeating Abe Rosen, 150–148. Michigan State university carried off national intercollegiate team laurels in 1956 for the second straight year.

(T. V. H.)

Biochemistry. **Animal Hormones.**—Tremendous advances were made in the hormone field during 1956, particularly among the steroid hormones. Cortisone, which had been isolated and synthesized a few years before and extensively used in arthritis therapy and other diseases, was found to have severe limitations because of the nonspecificity of its physiologi-

cal action and its side effects. Hydrocortisone and halogen derivatives of both hydrocortisone and cortisone were found to be more potent in their action than cortisone. After these derivatives had established a firm foothold in the hormone field, prednisolone and prednisone (from hydrocortisone and cortisone, respectively) were synthesized. These compounds differed chemically from their predecessors in that they possessed an additional double bond in the A ring of the steroid nucleus. Activity of these steroids was more potent, and less serious side reactions due to salt effects occurred after prolonged use. Water retention, a major metabolic side effect among most previous steroid compounds, was not pronounced with these two compounds.

Great research effort was spent in the direction of diminishing some hormonal influences of steroids while maintaining or increasing other properties. A steroid (21-hydroxypregnan-3, 20-dione sodium succinate) was prepared which had no hormonal activity but was a potent anesthetic. Another steroid, 17 α ethyl-19 nortestosterone, structurally related to testosterone (the male sex hormone) was prepared which had only $\frac{1}{16}$ of testosterone's sex hormone activity but was as active as testosterone as an anabolic agent. This hormone could be used in aiding the rebuilding of human tissue in many diseases. Another steroid hormone (11 β , 17 β dihydrox-9 α fluoro-17-methyl-4 androsten-3-17-one) was synthesized which was 10 times as potent as methyl-testosterone as a sex hormone and 20 times as effective as an anabolic agent. Another tailor-made steroid hormone reported during 1956, was 19-nor-17 ethyl-testosterone. This compound was the most potent orally effective progestational hormone, and it appeared that it might find considerable use in the prevention of habitual abortions.

Two new factors affecting insulin concentration in the blood were studied. A specific proteolytic enzyme which breaks down insulin was found in liver and other tissues. This enzyme was named insulinase, and it attracted considerable attention since its activity could be at least part of the explanation for the need for continual insulin production. Some success was reported in efforts to synthesize chemical compounds which could specifically inhibit this enzyme. It was hoped that these compounds could be administered orally to some diabetics who, although producing some insulin, still needed injections of supplementary amounts of insulin. An additional factor in regulating the insulin level in severe diabetes was also discovered. It was found that during acidosis, which occurs in an uncontrolled diabetic, an abnormal protein appears in the globulin fraction of the blood which in some manner inhibits the action of insulin. This compound disappears after injection of large amounts of insulin.

The anti-insulin hormone which had been found in some insulin preparations was crystallized and recognized as a new pancreatic hormone. The compound was named glucagon, and causes a remarkable increase in blood sugar when injected. It has a molecular weight of 4,200 and can be considered a protein although it is almost too small to be called a protein. Glucagon does not contain the amino acids cystine, proline or isoleucine, but in contrast to insulin, it does contain both tryptophan and methionine. Considerable progress was made in determining the amino acid sequence in glucagon. It was also reported that glucagon is destroyed by the same liver enzyme which destroys insulin.

A number of experiments on the site of action of insulin were reported. Evidence was presented that insulin both promotes glucose transport into cells and the ability of the cell to metabolize the glucose. However, the specific chemical reaction involved was not identified.

Plant Hormones.—A remarkable new plant growth hormone was chemically identified. After 20 years of work on the "Bokanai" rice disease T. Tobuta and Y. Sumiki in Japan isolated a

crystalline compound which at a concentration of 1 p.p.m. stimulated the growth of rice, wheat barley and tobacco. The compound was named gibberellin A since it was obtained from a fungus called *Gibberella fujikuroi*. Through the recent works of scientists in Japan, the United States and England considerable amounts of the compound (and related compounds) were isolated from fungus cultures, the tentative structure worked out and the biological properties investigated. The structure of gibberellic acid is quite complicated and it appeared that because of this complicated structure it would be prepared by fungus fermentation rather than by chemical synthesis.

Treated with gibberellic acid, ornamentals such as geraniums, sunflowers and roses grew from $\frac{1}{2}$ to 3 times taller than comparable untreated plants. Heights of crop plants such as string beans, peppers and corn in many cases doubled or tripled as the result of similar applications of the chemical. New growth of young forest trees such as willow oak, tulip poplar and maple were greatly increased by treatment with gibberellic acid. Such results were not possible with recent plant hormone regulators. Linear growth is not the only advantage. Additional preliminary work showed that during the early stages of growth, both the weight of fresh dry bean and string bean plants and the amount of solid matter in them are increased 30% to 40% by gibberellic spraying. In some cases flowering was advanced by one to several weeks but in other cases flowering was retarded.

Another important plant hormone known as "kinetin" was also chemically identified. This hormone which promotes cell division in plants, was isolated and synthesized. In plant tissue culture cell enlargement occurs in the presence of indole acetic acid but cell division will not occur unless a source of kinetin is added. Kinetin activity was present in aged or autoclaved preparations of ageing sperm deoxyribonucleic acid, but not in fresh preparations. The active crystalline material was obtained by butanol extraction of autoclaved deoxyribonucleic acid, followed by chromatography on ion exchange resins. Kinetin is active at a level of 0.01 p.p.m. Kinetin was characterized as 6-furfurylamino purine and the structure was proved by synthesis. The biological activity of the synthetic and isolated kinetin were identical.

Chemical Reconstitution of Tobacco Mosaic Virus.—Careful degradation studies revealed details of the structure of the rodlike tobacco mosaic virus. When the protein of the virus was carefully removed by degradation with a detergent, the nucleic acid was observed to lie as a threadlike centre core running the length of the virus rod. The protein portion is apparently the outer overcoat protecting the nucleic acid. In a remarkable experiment, H. Fraenkel-Conrat and R. C. Williams showed that the tobacco mosaic virus may be reconstituted by mixing its two structural components under controlled conditions. Protein obtained from the virus by careful treatment with alkali combined stoichiometrically with nucleic acid obtained from the virus by treatment with sodium dodecyl sulphate to yield nucleoprotein rods containing about 6% nucleic acid and 94% protein and possessing virus infectivity. It also appeared that the nucleic acid of the reconstituted virus rods was located along the central axis of the normal virus rod.

Further evidence regarding the central importance of the virus nucleic acid was made clear when it was found that certain preparations of virus nucleic acid carried a residual infectivity which differed in stability from that characteristic of the regular rod of tobacco mosaic virus. This residual infectivity was found only in very fresh preparations and disappeared when preparations were permitted to stand at room temperature or were subjected to the action of an enzyme which breaks down the nucleic acid. It was concluded that this virus activity is a property of the nucleic acid itself and that the role of the protein is that of a

stabilizer which also determines the immunological properties and perhaps, to a large extent, the host specificity of the virus.

Biochemistry of Cancer.—There was a strengthening of the concept of protein binding as essential to the action of chemical carcinogens. Recent experiments established that the pituitary gland is not essential for carcinogenesis. Remarkable claims were made that viruses can cause mouse leukemias. Some progress was made in immunizing animals against transplanted tumours, and the suggestion was made that humans form antibodies to their own tumours. Increased activity in chemotherapy centred around the evaluation of screening methods, but no new clinically effective drugs were discovered. In spite of intensive work the essential biochemical lesions of cancer remained unknown.

(See also PHYSIOLOGY.)

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ENCYCLOPÆDIA BRITANNICA FILMS.—*Allergies* (1952); *Antibiotics* (1952); *Atom and Agriculture* (1953); *Atom and Biological Science* (1953); *Atom and Medicine* (1952); *Bacteria—Friend or Foe* (1954).

Biography: see AMERICAN LITERATURE; BOOK PUBLISHING AND BOOK SALES; ENGLISH LITERATURE; OBITUARIES; and, in their alphabetical positions, biographies of living persons.

Biology: see ANTHROPOLOGY; BOTANY; ENDOCRINOLOGY; GENETICS; MARINE BIOLOGY; PHYSIOLOGY; ZOOLOGY.

Birth Control. A considerable increase in the number of government grants to support and encourage the spread of family planning programs in underdeveloped countries was noted during 1956. In India, a program for intensive expansion of family planning services, especially in rural areas, was drawn up by the government for inclusion in its second five-year plan. The program called for an expenditure of \$6,300,000 to establish 1,100 health centres providing child welfare and maternity services as well as family planning.

The first elected (1955) representative government of Singapore granted \$28,335 to the Family Planning association of Singapore, which operated 14 clinics whose total attendance numbered 10,168. A government grant totalling \$10,000 was made to the Family Planning association of Hong Kong for assistance in operating a new central clinic and headquarters which were being built by the association. The Hong Kong Family Planning association sponsored nine clinics, serving a total of more than 15,492 women. Under government auspices, an organized campaign for birth control was launched in Egypt, aimed at curbing the country's rapidly rising population. The Population commission's medical committee was charged with opening 12 family planning clinics. Eight clinics opened during 1956.

The government of Japan, which adopted a national family planning program in 1951, allotted nearly \$90,000 in 1956 to teach birth control methods and supply free contraceptives to the indigent; 783 nationally administered health centres gave wide publicity to family planning, and more than 28,600 persons, mostly midwives, took the conception control course offered by the prefectures.

Italy's first consulting office for information on scientific contraceptive methods was opened in Rome under sponsorship of the Italian Association for Demographic Education. The first office of its kind to exist in Italy, the association waged a campaign to overcome religious and political prejudice against birth control, and to repeal Italy's anti-birth control law, adopted by the government in 1930.

Official and unofficial reports were received during 1956 indicating the spread of birth control in the communist world. Hungary approved contraceptives as a means of fighting the

country's abortion menace early in the year. In Czechoslovakia, a treatise on birth control, *Anticonception and the Fight Against Abortion*, was published by the state Health Publishing office.

In Communist China, where the net daily increase in population was 34,000, or more than a third of the entire world's net daily increase, the government, in a sharp departure from communist policy, launched an all-out birth control program. Twenty-seven birth control information centres were opened in Peking, and it was reported that government newspapers were issuing detailed instructions on the use of contraceptives.

A world-wide essay contest to find a solution to the problem of overpopulation in underdeveloped countries was sponsored during 1956 by the International Institute for Social-Ecclesiastical Research in Geneva, an official Roman Catholic institution. The unprecedented contest offered a \$5,000 prize for the best proposed solutions to the overpopulation problem, within the framework of Catholic principles. The contest prospectus recognized the difficulty of increasing food supplies and raising living standards fast enough to keep up with population growth.

The International Planned Parenthood federation added three new countries to its membership rolls—Belgium, Denmark and New Zealand—bringing the total membership to 18. Other member countries were: Australia, Ceylon, the German Federal Republic, Great Britain, Hong Kong, India, Italy, Japan, the Netherlands, Pakistan, Puerto Rico, Singapore, Sweden, Union of South Africa and the United States.

More than 850 persons attended the 36th annual meeting of the Planned Parenthood Federation of America, held in New York city in May 1956. Annual Lasker awards in planned parenthood were presented to Warren O. Nelson, medical director of the Population council, and Robert C. Cook, editor of the *Population Bulletin*, for their contributions in the field of family planning. There were 110 state leagues and local committees in 29 states and the District of Columbia, including the Margaret Sanger Research bureau in New York, affiliated with the Planned Parenthood Federation of America. (M. Sr.)

Birth Statistics.

The birth record for the United States during 1956 was somewhat above the high level established the year before, according to comparable data for the first eight months. During this period, the number of births rose by 2.5%; however, the 1956 birth rate for the period, 24.5 per 1,000 population, was 0.4% above that for the like period of 1955. For the year 1955 as a whole, the number of births (including an allowance for those unregistered) totalled 4,091,000, with a corresponding birth rate of 24.6 per 1,000 population.

All geographic areas, except the New England states, reported more births during the first eight months of 1956 than in the like period of 1955. There was a wide variation in the birth rates among the individual states. For the entire year 1955 the birth rates varied from a low of 21.4 per 1,000 population in New York and Pennsylvania to a high of 32.6 in New Mexico. The 1955 birth rates per 1,000 population were as follows for the geographic divisions: New England, 23.1; middle Atlantic, 21.4; east north central, 24.8; west north central, 24.6; south Atlantic, 26.3; east south central, 26.8; west south central, 26.9; mountain, 28.7; Pacific, 24.

For Canada, data covering the first eight months of 1956 indicated a very small decrease in the number of births compared with the corresponding period of 1955. For the entire year 1955, according to provisional data, Canada recorded 441,681 births; the corresponding birth rate of 28.4 per 1,000 population was 1% below the rate for 1954. In England and Wales there was an increase of 6% in the number of births in the first half of 1956, compared with the same period of 1955, according to provi-

Table I.—Birth Rates per 1,000 Population in Selected Countries for 1955 and 1954

Country	1955	1954	Country	1955	1954
North America			Luxembourg	16.1	16.3
Canada	28.4	28.7	Netherlands	21.4	21.6
Costa Rica	40.3	41.3	Norway	18.7	18.5
Dominican Republic	43.6	43.9	Portugal	23.9	22.7
Guatemala	48.1	51.7	Spain	20.6	20.0
Honduras	*	41.9	Sweden	14.8	14.6
Mexico	46.2	46.4	Switzerland	17.1	17.0
Panamá	40.0	39.7	United Kingdom	15.4	15.6
Puerto Rico	34.8	34.9	Yugoslavia	26.7	28.6
Salvador, El	47.0	48.1			
Trinidad and Tobago	41.9	41.4	Asia		
United States	24.6	24.9	Ceylon	37.9	36.2
South America			Hong Kong	38.7	36.6
Argentina	*	24.1	India	30.5	28.4
Chile	35.0	34.3	Israel (Jewish pop.)	27.2	27.1
Ecuador	44.5	44.0	Japan	19.4	20.1
Peru	29.5	30.0	Malaya	*	43.8
Uruguay	12.2	*	Singapore	*	48.9
Venezuela	47.1	46.8	Syria	20.6	22.4
			Formosa	45.3	44.5
Europe			Africa		
Austria	15.5	14.9	Union of South Africa (Europeans)	26.0	25.5
Belgium	16.7	16.7			
Czechoslovakia	22.2	20.6	Oceania		
Denmark	17.3	17.3	Australia	22.6	22.5
Finland	21.1	21.4	Hawaii	31.2	31.0
France	18.6	18.9	New Zealand		
Germany (Western)	15.7	15.7	Europeans	24.9	24.7
Ireland	21.2	21.1	Maois	*	44.4
Italy	18.1	18.2			

*No data.

Source: United Nations, *Monthly Bulletin of Statistics* (Oct. 1956); Office of Population Research, Princeton University, and Population Association of America, *Population Index* (July 1956); Canada, Dominion Bureau of Statistics, *Preliminary Annual Report of Vital Statistics* (1955).

Table II.—Size of Family Among White Women, 40 to 44 Years Old, Married Once and With Husband Present, According to Major Occupation Group of Husband, United States, 1950

Occupation of husband*	Per cent with no children ever born	Children ever born per 1,000 women	per 1,000 mothers
Total	17.4	2,422	2,932
Professional, technical and kindred workers	21.5	1,817	2,315
Farmers and farm managers	13.2	3,279	3,777
Managers, officials, proprietors (excluding farm)	18.3	1,930	2,363
Clerical, sales and kindred workers	20.5	1,884	2,370
Craftsmen, foremen and kindred workers	15.7	2,392	2,837
Operatives and kindred workers	16.1	2,602	3,103
Service workers	18.7	2,130	2,620
Farm labourers and foremen	12.9	4,134	4,744
Labourers, excluding farm and mine	13.9	3,179	3,692
All others	21.7	2,819	3,603

*Husbands in experienced civilian labour force for specified occupations; the "all others" category includes husbands not in experienced civilian labour force and husbands with occupation not reported.

Source: Bureau of the Census, 1950 Census of Population, Series PC-14, No. 22 (Sept. 7, 1956).

sional data. For the whole of 1955, births totalled 664,954, and the birth rate was 15.4 per 1,000 population, each being 1% below the corresponding figures for the year before. For Australia 207,677 births (exclusive of full-blood aborigines) were reported for 1955, the birth rate being 22.6 per 1,000 population. In the first quarter of 1956, the birth rate was provisionally reported as 21.9 per 1,000 population, or 2.7% below that for the similar period of 1955. In New Zealand the birth rate of 24.5 for the first six months of 1956 was slightly higher than in the first half of 1955. Birth rates during 1954 and 1955 for a number of countries are shown in Table I.

Childlessness and size of family in the United States vary widely with the occupational status of the husband, according to the data shown in Table II.

(See also CENSUS DATA, U.S.; INFANT MORTALITY.)

(M. Sp.)

Bismuth: see MINERAL AND METAL PRODUCTION AND PRICES

Blind, Education of the.

During 1955-56 the advancement of work for the blind throughout the world was highlighted primarily by conferences and by the regional implementation of decisions and recommendations of the several international conferences of recent years. In Oct. 1955 the first Far East Conference on Work for the Blind was held in Tokyo, Jap., with delegates from 11 Asian countries, plus official observers from other nations and nonself-governing territories of the region, the United Nation

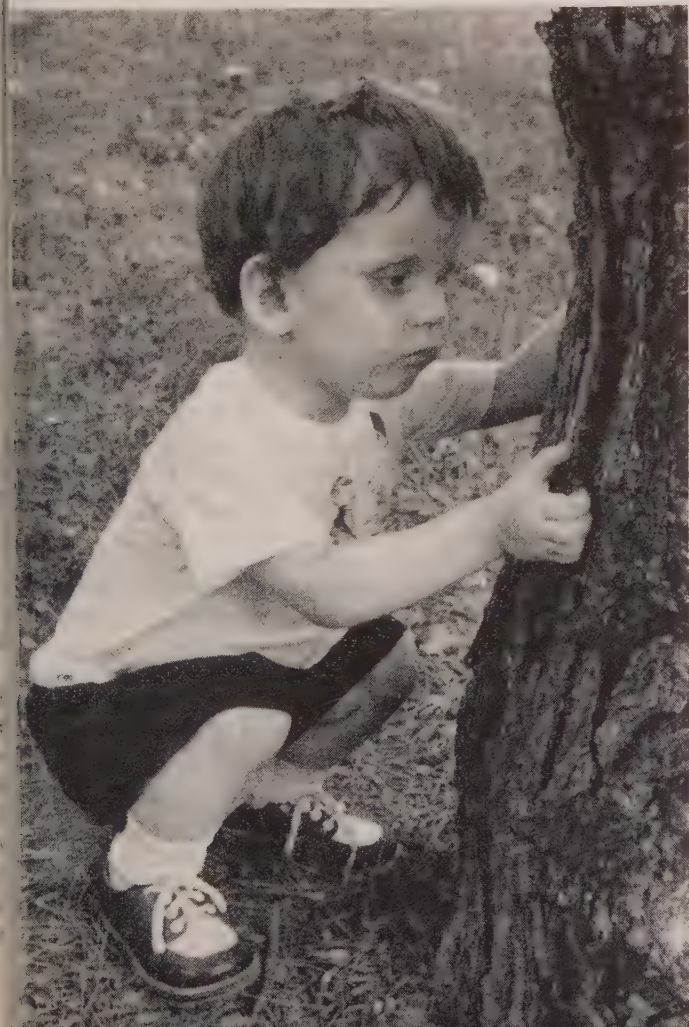


Above: The boy bites a flower to taste its beauty

GARDEN OF THE BLIND

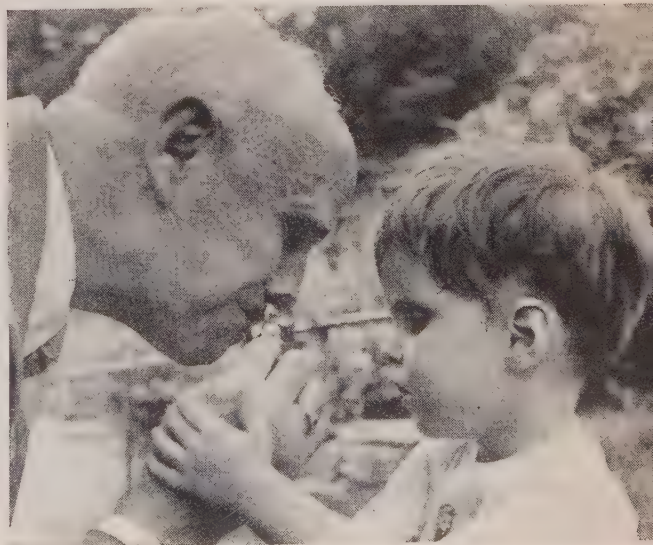
Part of the John J. Tyler Arboretum near Lima, Pa., the garden was designed for sightless visitors who are encouraged to pick as well as taste and feel flowers. To make identification easier for the blind, plants were chosen for their odour, texture and shape. The photographs show a blind man and blind boy walking in the garden on a spring day in 1956

Below: The boy learns about a pine tree by feeling its bark



Above: A Braille plate identifies petunias; below, the man guides the boy's hand along the raised dots.

Below: Both enjoy the taste and smell of a mint plant



and its specialized agencies and prominent international non-governmental organizations. Among the decisions of this conference was the recommendation that participating countries introduce new methods for training blind children and adults aimed at their full occupational, social and cultural integration within their home communities (in this area, usually the small rural village), rather than the western type of training which succeeds only in setting the blind of this region even more apart from their indigenous backgrounds.

In recognition of the need for maximum collaboration on regional problems between all countries of the area, the World Council for the Welfare of the Blind established a Standing Committee on the Far East, South, and South East Asia Affairs, composed of one representative from each country and territory of the region.

In Sept. 1956, a national conference was held in India at which emphasis was laid on measures that would expand the field of opportunity for employment of the blind in suitable industrial and rural occupations, a subject of paramount regional as well as national importance.

A number of educational facilities for blind children were established in the far east, notably a new school for the deaf and blind at Jaffna, Cey., to serve the northern provinces of that country, and schools for the blind in Thailand and Indonesia. In common with the recommendation of the Far East conference, all these new schools planned their curriculums to lay special stress on vocational and social preparation for normal life rather than upon academic subjects.

In Africa the research and demonstration centre of the Uganda Foundation for the Blind was providing training in the arts and crafts of the countryside, simple hygiene and African music and dancing, with the support of the United Nations and other international bodies. While this program served only sightless adolescents and adults, it was closely linked with the syllabus of the local school for blind children, to ensure continuity of method and service.

Considerable interest in work for the blind was becoming evident throughout the Arabic world, largely as a result of the pilot demonstration project launched in Cairo, Egy., three years earlier through collaboration of the government of Egypt and the United Nations. Plans were under way for the introduction in 1957 of national co-ordinated programs for the education and rehabilitation of the blind in Syria and Lebanon. Surveys of the British colonial territories of Central and East Africa were undertaken by representatives of the British Empire Society for the Blind.

Concentration upon the solution of regional problems through regional action was also the purpose of the European Seminar on Rehabilitation for the Blind, held in London, Eng., April-May 1956, under the joint auspices of the World Council for the Welfare of the Blind and the World Veterans federation, with the participation of the United Nations and the International Labour organization, and with the Royal National Institute for the Blind and St. Dunstan's acting as joint hosts. Eighteen countries were represented.

The keynote of the seminar was the necessity for close partnership between the statutory and private organizations in the field of adjustment, training and employment of blind adults, as well as the educators of the young blind, so as to provide all possible assurance of complete integration of the sightless into community life.

In Jan. 1956 the Royal National Institute for the Blind opened a new centre for blind adolescents at Hethersett, Reigate, Surrey. The purpose of the new centre was to help young blind persons adjust themselves more easily to the demands of a seeing world and to play their part in that world more effectively, both

at work and in their leisure hours. It was hoped that the eventual entry of these young workers into the labour market would stimulate and encourage new fields of employment for the blind generally.

In the field of literature for the blind, international activity was maintained looking to the acceptance of world uniformity in Braille usage, in furtherance of the program launched initially by UNESCO (the United Nations Educational, Scientific and Cultural organization). Although the last international conference on Braille music notation was held in Paris in 1929, at which time major agreement in this field was accomplished, the intervening quarter of a century made clear the need for more stringent observance of common usage in music notation, and also provision for the representation in Braille of the major forms of non-European music.

During the year, the World Braille council made progress toward the publication of a revised international manual of Braille music notation. A number of difficult problems in the field of orthographic Braille were resolved, and preliminary work on an international system of Braille mathematical, scientific and chemical symbols was started.

New Braille printing plants were installed in Portugal and Uruguay, while the expansion of existing production was undertaken in Formosa and Japan, where the government had assumed full responsibility for the publication of all Braille school texts. The establishment of Indonesia's first Braille printing plant was planned for early 1957.

In July 1956 the congress of the United States amended the authorizing legislation of the act of 1879 "To Promote the Education of the Blind." The original act provided an annual appropriation to the American Printing House for the Blind, Louisville, Ky., for the purpose of supplying school texts and special educational apparatus for use by blind school children throughout the states and territories. The new legislation permitted the extension of these services to all blind children, wherever they might be educated in public educational institutions, not just schools and classes for the blind, and increased the ceiling appropriation authorization from \$260,000 to a total of \$410,000. It was estimated that in 1956 there were about 9,000 blind children of school age in the United States.

Following several years of preliminary planning, a conference composed of representatives from Europe and the middle east met in Paris, Fr., in April 1956, under the auspices of the American Foundation for Overseas Blind, to select a medium of recording that could be generally adopted for the publication of "talking books" throughout the region, to determine the technical requirements involved in ensuring maximum interchange of recorded literature between countries, and to prepare an international plan for the mass duplication and distribution of books recorded in the several countries. At this meeting, magnetic tape was selected as the common medium, and each country was made responsible for selecting the book titles and for making the original master tapes.

In Feb. 1956 the first national workshop on problems relating to vocational training and employment for deaf-blind adults was held in New York city, under the sponsorship of the American Foundation for the Blind. The particular phases discussed included the necessity of promoting public interest in hiring deaf-blind adults, and a thorough understanding of the many problems confronting placement workers in finding gainful employment for the deaf-blind.

(See also EYE, DISEASES OF THE.)

(F. E. D.)

Blood, Diseases of the. A panoramic picture of haematology in 1956, representing the fields in which the most rapid advances had been made,

was presented at the 6th Congress of the International Society of Hematology and the International Society of Blood Transfusion, held in Boston, Mass., in Aug.-Sept. 1956. The congress was attended by 1,500 physicians from all over the world.

Leukemia.—Causative factors in leukemia received considerable attention. Shimkin's statistics indicated, as did those of others, a considerable increase in the incidence of leukemia in the past 30 years. Possible factors, as quoted by Hausmann, of Germany, were exposure to X-rays and to certain chemicals, notably benzol. There was some indication that leukemia was more common in Jews than in Gentiles, and in whites as compared with Negroes. In South Africa, Greig demonstrated that leukemia was far more common in the Bantu than in whites.

O. Schwartz's studies (Chicago, Ill.) indicated, as did those of others, that viruses were the cause of leukemia in rats and possibly in humans. All observers agreed that X-ray exposure—either with therapeutic or large diagnostic dosage, or as one large exposure (atomic bombs) or by the continued injection of radioactive isotopes—could be productive of leukemia. It was noted by both U.S. and Soviet observers that certain cancer-producing chemicals, notably methylcholanthrene, could also produce leukemia in rats.

Several fundamental differences between leukemia and non-leukemic cells were discussed. Unfortunately, no single criterion distinguishing a leukemic cell from a normal one was established.

In the treatment of leukemia, chemical methods were emphasized, notably the use of urethane in myeloma, that of myleran in chronic granulocytic leukemia, that of CB-1348 in lymphoid leukaemias and leukemia, and of even newer principles, such as CB-139, of recent German origin. It was emphasized that a comparative study of chemotherapy in acute leukemia was a most desirable thing, and a detailed plan for such a study was outlined. According to Osgood, a comparative study of various methods used in the treatment of acute leukemia indicated that the steroids (cortisone and the like) had significantly improved the total survival and the period of activity after treatment. Massive doses of steroids, notably meticorten, were of distinct value in some cases, particularly of the acute variety. In a general review of the treatment of acute leukemia, Whitby emphasized that none of the present-day methods were particularly satisfactory, and that other modes of attack of the leukemia overgrowth were urgently needed.

Nucleonics.—From two standpoints, radioactivity came to the forefront: (1) the use of radioactive isotopes for "tagging" blood and tissue cells and following along what happened to them; and (2) the harmful effects of radioactivity, chiefly on the blood-forming organs. By the use of tracer or tagging techniques, it became possible to study rates of formation and destruction of the various cells of the blood, and to peer into the cell's interior, thus getting an indication of its metabolism or functional state. Thus, iron, vitamin B₁₂, and radioactive chromium were of considerable help, together with other isotopes, in studying what happened to cells and what went on inside of them. Studies of the disturbed physiology in pernicious anaemia were carried much further than previously by the use of radioactive isotope ⁶⁰B₁₂ (Schilling test).

Harmful effects of radiation by X-ray received considerable attention. British workers reported on the development of leukemia following X-ray treatment for ankylosing spondylitis (rheumatism of the spine). E. P. Cronkite, of Brookhaven National Laboratories, reported on the harmful effects of radioactive fallout, observed chiefly on the blood. These effects persisted to a greater or less extent for at least a year. Whether they might potentiate in leukemia, as after the atomic bombs, was subject to speculation. Watanabe, of Hiroshima, Jap., demonstrated that continued administration of small doses of radioactive sub-

stances to animals was productive of leukemia.

Polycythaemia vera, a chronic disorder of increased productive activity of the whole bone marrow, resulting in excessive blood, was thoroughly reviewed and its end-results analyzed. Whether radioactive phosphorus was in the long run the best method of therapy was not settled.

Spleen.—This mysterious organ was fully discussed by a group of ten speakers. It was found that the spleen removed various particles from the red cells, as well as deformed or unusually small red cells themselves. That the spleen "trapped" such cells was shown by isotope studies; the big spleen became an immense trapping organ. Over-activity of the spleen (hypersplenism) resulted in changes in all the blood cells, either because too many were destroyed or their production interfered with. The spleen was concerned with the development of immune antibodies, and in very young children removal of the spleen was shown to result in the tendency to severe infection. Removing the spleen was of utmost importance, in fact curative, in many obscure haematological problems.

Haemorrhagic Disorders.—Haemophilia, the classical form and the various newly discovered types (PTC deficiency or Christmas disease, PTA deficiency and Hageman factor deficiency) was studied. These conditions were due to low concentrations in the blood of some individuals of normal plasma factors, although in some cases clotting inhibitors were present. As yet, no purified constituent of normal blood suitable for the continued injection into the haemophiliac had been developed, although investigations were continuing. Unfortunately, some individuals with haemophilia receiving frequent blood transfusions developed an antibody against normal blood, thus making the problem even more difficult. The rare occurrence of haemophilia in the female was demonstrated.

Platelets, the third element of the blood cells, are concerned with keeping the blood within the circulation and with initiating clotting. Chemical and metabolic studies of these small bodies, hitherto lacking, were revealed, and these might have considerable importance in storage of platelets for use during an emergency. It was shown by E. Klein that flash drying (lyophilization) of platelets allowed storage for many months and subsequent use in haemorrhage when salt solution was added. The platelet precursors, the huge megakaryocytes of the marrow, were studied by motion-picture techniques by both French and Japanese workers.

An unusual bleeding disturbance known as fibrinolysis, in which the blood clot, although formed, becomes quickly dissolved, was discussed as a frightening disorder during some cases of childbirth. The possibility of dissolving blood clots, as in coronary thrombosis, was discussed by Ambrus and co-workers on the basis of experimental work with dogs, and another group of workers actually worked with a purified clot-dissolving agent, streptokinase. In addition, a number of papers describing various new anticlotting factors were presented.

Anaemia.—The anaemias arising from a deficiency of various factors, including pernicious anaemia, sprue and others, were discussed, first from the historical standpoint and then from the metabolic and chemical standpoints, notably B₁₂ and folic acid relationships. The remarkable advances in knowledge of diseases resulting from abnormal haemoglobins (sickle cell anaemia, haemoglobin C, D, E, G, H, I, etc.) were presented in considerable detail, with emphasis on their heredity, geographic relationships and interactions of one abnormal gene with another. Another subject of considerable interest was discussed fully—that of the erythropoietic hormone, a substance stimulating red cell production. This was discovered recently in the blood plasma of anaemic animals and could cause increased red cell production in normal animals. It was, of course, hoped that further develop-

ment of such a substance might be of future value in the treatment of anaemias not responding to presently known factors. The refractory anaemias associated with disturbances of the bone marrow, and particularly in association with tumours of the thymus gland, were also of considerable interest.

Immunohaematology.—In some blood disorders, the body apparently develops substances that attack its own blood cells (autoantibodies). Red cells, white cells, platelets and small blood vessels may be so attacked, resulting in the various kinds of anaemia and in conditions of low white cells, low platelets and so on. The last decade had seen considerable advance in this field, with the result that many mysterious disorders, notably systemic lupus erythematosus, were far better understood.

Haematology of recent years had been characterized by increasing knowledge of the chemistry and metabolism of the blood cells, and the control of such serious disorders as leukemia, haemophilia and the haemoglobinopathies was a distinct possibility once the chemical defects could be conquered.

(See also **PHYSIOLOGY.**) (W. DK.)

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Blue Cross: see **INSURANCE.**

Bobsledding. Stan Benham, veteran driver from Lake Placid, N.Y., scored a sweep of the major events on the Mt. Van Hoevenberg run at Lake Placid in Feb. 1956. Benham who in 1955 drew a three-year suspension from international competition, teamed with Pat Martin of Massena, N.Y., to dominate United States competition for the season. Martin had withdrawn from the U.S. Winter Olympics' bobsledding team in protest against the barring of Benham. On Feb. 18, 1956, Benham and Martin, competing in a heavy snowstorm, won national Amateur Athletic union two-man honours with a total time of 5 min. 3.86 sec. for four runs down the mile-long slide. John Helmer of Lake Placid and Henry Sterms of Saranac Lake, N.Y., placed second. The next day, Benham, riding with Chuck Randolph, Helmer and Martin carried off the national four-man award. Their elapsed time for the four heats was 4 min. 47.95 sec.

In the North American A.A.U. two-man championship tests of Feb. 25, Benham and Martin again dominated the field, triumphing with a total time of 5 min. 14.73 sec. Joe Meconi and Don Burrell of Ausable Forks, N.Y., took second place in 5 min. 17.22 sec. On Feb. 26, Benham and his teammates Martin, Ran-

dolph and Helmer, won the North American four-man crown in 4 min. 44.38 sec. Earlier in the campaign, Benham had scored victories in the J. Hubert Stevens memorial trophy races and the Adirondack A.A.U. championship meet. (See also **OLYMPIC GAMES.**) (T. V. H.)

Bolivia. Bolivia is a landlocked republic in south central South America. Area: 424,162 sq.mi.: pop. (1950 census) 3,019,031; (1955 est.) 3,198,000. The legal capital is Sucre, pop. (1950 census) 38,400; the actual seat of government is La Paz, pop. 266,763. Other major cities (with pop., 1950 census) include Cochabamba 74,949, Oruro 58,706, Potosí 43,579, Santa Cruz 34,005 and Tarija 16,474. Racial distribution is estimated to be 52.34% Indian, 27.5% mestizo, 13.08% white, 0.22% Negro and 6.85% unspecified. Religion is predominantly Roman Catholic. Presidents in 1956: Victor Paz Estenssoro, until Aug. 6; thereafter Hernán Siles Zuazo.

History.—Grave economic difficulties and festering political resistance beset the administrations of Pres. Victor Paz Estenssoro and his successor, Hernán Siles Zuazo. Increased revenues from the Camiri oil fields and economic assistance from the United States government staved off fiscal disaster. In political affairs, the government party, the National Revolutionary Movement, maintained uneasy control, in spite of pressure from the leftist Central Labor organization and disaffection by the right-wing Socialist Falange.

The most hopeful sign on the economic scene was rising oil production. The government announced in April that production of petroleum was 11 times greater than it had been in 1952. Official efforts to attract foreign investment capital led to the signing of a 40-year contract with the Gulf Oil corporation, which agreed to build a system of pipelines from the Bolivian oil fields to the Pacific ocean in exchange for extensive exploration and exploitation rights. Agreements were made with other operators for distribution of automotive gasoline to Chile and Peru, and for supply of natural gas to Chilean copper mines.

United States economic support for Bolivia took the form of tin purchases, sales of surplus foodstuffs, aid to the national highway construction program, and technical assistance.

Vice-Pres. Siles Zuazo was overwhelmingly chosen in elections on June 17 to succeed Pres. Paz Estenssoro. The National Revolutionary Movement candidate was supported by Juan Lechin, leader of the powerful Central Labor organization, whose demands for a majority representation in congress had provoked a temporary rift in the party in April. The chief opposition party, the Socialist Falange, charged the government with fraudulent electoral practices and unofficially withdrew its candidate, Oscar Unzaga de la Vega, three days before the election. The "Trotskyist" Revolutionary Workers' party and the Communists lost legal status for failing to obtain at least 4% of the total vote.

Siles Zuazo was inaugurated on Aug. 6 and promised to protect democratic institutions, fight inflation, diversify the country's economy and attract foreign capital. One of his first official acts was to promulgate a law calling for the creation of a new constitution. In September, 4,000 citizens of La Paz demonstrated against inflation, burning the pressroom of the government daily, *La Nación*, and the studios of Radio Illimani. The president attributed the violence to the Socialist Falange and ended the policy of national pacification proclaimed upon his inauguration.

(R. HN.)

Education.—In 1952 there were 234,000 primary school pupils, 24,000 secondary school pupils, 6,000 technical school pupils and 2,000 normal school pupils. There were universities with more than one faculty at Cochabamba, La Paz, Oruro, Potosí and Sucre. According to the 1950 census, 68.9% of those 5 yrs. of age and over were illiterate. Education was scheduled to receive 15% of governmental expenditures in 1956.

Finance.—The monetary unit is the boliviano, valued during 1956 at

U.S. BOBSLED TEAM testing the run at Cortina d'Ampezzo, It., before the opening of the Winter Olympic games held there in 1956



0.52 cents U.S. currency, official rate, and on July 26, 1956, at 0.01 cents, legal free rate. The 1956 budget estimated revenue at Bs. 72,500,000,000 and expenditure at Bs. 74,000,000,000. The public debt on Dec. 31, 1953, was placed at Bs. 37,487,400,000, including the foreign debt amounting, with accrued interest, to the equivalent of Bs. 30,487,400,000. Currency in circulation on Dec. 31, 1955, totalled Bs. 38,320,000,000; demand deposits, Bs. 33,940,000,000. The U.S. department of commerce estimated U.S. direct private investments in 1955 at \$11,000,000. The cost-of-living index at La Paz stood at 415 in June 1955 (1953=100).

Trade and Communications.—Exports in 1955 (excluding gold) were about \$98,100,000 (1954: \$94,300,000); imports, \$82,400,000 (1954: \$65,500,000). Leading exports in 1955 were tin (60%), tungsten (16%), lead (7%), zinc (6%) and silver (5%). Important imports in 1954 included wheat (8%), sugar (8%) and mining machinery (7%). Leading customers in 1954 were the U.S. (54%) and the U.K. (33%); leading suppliers, the U.S. (38%), Argentina (12%), Peru (11%), the U.K. (7%) and Germany (6%).

Railway lines in operation (1955) totalled 1,690 mi. The length of the highway system was officially placed at 9,806 mi. in 1955. Motor vehicles on Jan. 1, 1954, included 6,128 automobiles, 14,962 trucks and 791 buses. Telephones (Jan. 1, 1955) numbered 11,400, 94.3% of which were automatic.

Agriculture.—Important crops included wheat, maize, barley, rice, potatoes and cotton. Official livestock estimates (1955) showed 2,259,000 cattle, 6,464,000 sheep and 436,000 pigs; in 1951 there were an estimated 1,800,000 llamas and alpacas. The principal exploited forest products were rubber and cinchona bark.

Manufactures.—According to statistics compiled by the National Chamber of Industries (La Paz), there were 1,320 factories in 1950 with gross value of production amounting to \$28,300,000. Most important, in terms of value of production, were textiles and clothing, beverages, foodstuffs and chemicals. Production estimates for 1955 included cement 37,000 metric tons, cotton textiles 9,500,000 metres and flour 53,700 tons. Installed electric energy capacity in 1955 was 87,450 kw., production was about 355,000,000 kw.hr.

Minerals.—Production in 1955 included tin 27,636 metric tons, wolfram (tungsten) 2,434 tons, lead 21,354 tons, zinc 18,506 tons, silver 5,851,107 fine oz., copper 3,518 tons, antimony 5,287 tons. Production of crude petroleum was 2,693,000 bbl.; crude oil refined totalled 2,124,084 bbl. (J. W. Mw.)

Bonaire: see NETHERLANDS ANTILLES.

Bonds: see BANKING; STOCKS AND BONDS.

Book Collecting.

Of the thousands of books and manuscripts which passed through the market during 1956, only three excited international attention. One was Susanna Rowson's *Charlotte Temple: A Tale of Truth*, the first American best seller, issued at Philadelphia in 1794 and thereafter reprinted in at least 200 editions. Though it had long been known that the original edition was printed at London in 1791, no copy had ever been reported before the one recently discovered in England and now deposited in the C. Waller Barrett collection. Another item was *The Capitall Lawes of New-England*, a Puritan code based exclusively on biblical commandments. This broadside, first printed by the Massachusetts Bay Colony in 1642, was known only by two copies of the London 1643 reprint, one at the British Museum and the other at the library of Lincoln Cathedral. By permission of the cathedral trustees, and with the concurrence of the British government, the second copy was acquired by the West Publishing company, St. Paul, Minn., for presentation to the Harvard law school library. Governmental intervention, however, prevented the export of another treasure, the 1576 manuscript of Thomas Whythorne, commonly recognized as the earliest-known English autobiography. This manuscript, purchased by James M. Osborn, was given to the Bodleian library.

Two caches of manuscripts also aroused the interest of scholars. One collection, discovered in Egypt, comprised 13 papyrus books written in the 4th century by adherents of the Coptic religious sect known as Gnostics. Of significance comparable with that of the Dead sea scrolls, these specimens were otherwise noteworthy as the most ancient writing to be bound in leather and the first on papyrus to be found in the shape of books. The other cache, discovered at the Château de la Grange, near Paris, consisted of thousands of letters and personal papers of the marquis de Lafayette. By 1957, the 200th anniversary of Lafayette's birth, the owner, Court René de Chambrun, planned to have a museum constructed for their exhibition. Still another cache was expected in the tomb of Sir Thomas Walsingham,

which it was believed might prove that Christopher Marlowe wrote Shakespeare; but the vault revealed nothing, not even the remains of its presumed occupant.

The affairs of collectors were in two instances the subject of protracted controversy. In the United States a district attorney contended before the federal court in St. Paul, Minn., that the manuscript notes of Capt. William Clark (of the Lewis and Clark expedition) belonged not to the heirs or to any local society but to the national government. As this claim had far-reaching implications, both for collectors and private institutions, a decision was anxiously awaited. In England the activities of a "book ring," a collusive group which depressed the bids for books desired by its members, were twice debated in parliament and finally charged by the Antiquarian Booksellers association as an offense subjecting its members to expulsion. Against this unethical if time-honoured scheme to control the prices at auction may be set the ingenious method for raising them at a sale held at Wellington, N.Z. There on May 17 many common books were bid to extravagant heights by representatives of various Auckland libraries, all of whom were bound to spend money at this auction or forfeit a legacy bequeathed to them by the very man whose books were on sale.

The year marked the 500th anniversary of the Gutenberg Bible (first published in the winter of 1455-56), an event celebrated in various exhibits and monographs. Also celebrated was the 250th anniversary of Benjamin Franklin's birth, the 100th of Sigmund Freud's and George Bernard Shaw's and, on Feb. 17, the centennial of Heinrich Heine's death. On that day it was announced that a private collector had given to the city of Düsseldorf, the poet's birthplace, more than 3,700 of Heine's manuscripts.

Admirers of Henry Wadsworth Longfellow suffered two grievous losses, first in the destruction by fire of the old Wayside inn at Sudbury, Mass. (scene of the famous *Tales*), and second in the demolition of the poet's birthplace at Portland, Me. On the foundation of the inn, however, the Ford foundation intended to construct a replica; and from the wreck of the home the inner trim was carried off to Bowdoin college, where Longfellow began his teaching career. At Concord, Mass., state and town officials dedicated a reconstruction of the "rude bridge," scene of the shot "heard round the world." (W. B. Tb.)

Book Publishing and Book Sales.

The number of new books and new editions published in the United States between Oct. 1955 and the end of Sept. 1956 totalled 12,524, continuing the upward trend. The total for the calendar year 1955 was 12,589 titles, up 688 over 1954 and topping the 1953 high in book production, which was 12,050 titles. The figures for the first nine months in 1956 showed a decrease of 65 titles for the period. Fiction titles for January through September totalled 1,608 in 1956 compared with 1,529 in the same period of 1955, while juveniles dropped to 989 from 1,005. Technical books were up to 369 against 322 a year before, while business titles dropped to 198 from 226. Religious titles were up 613 compared with 582. For the calendar year 1955, with its gain of 688 titles, the largest increases were in biography, general literature and criticism, juveniles and science. Decreases were in fiction and religion.

Best Sellers.—The best-seller list as of September is seldom the same as the year-end list because of the heavy bookstore sales in the last three months of the year. For instance, in 1955 *Andersonville* by MacKinley Kantor was third on the final fiction list of best sellers, but had no chance to appear on a September list as it was not published until late October, as was also the case with *The Tontine* by Thomas B. Costain and *Ten North Frederick* by John O. Hara, which were ninth and tenth on the

final list.

In Sept. 1956 *Don't Go Near the Water* by William Brinkley led the fiction list, followed by Françoise Sagan's *A Certain Smile* and *The Last Hurrah* by Edwin O'Connor in the second and third spots, according to reports from 60 booksellers in various parts of the United States. Then followed *Auntie Mame* by Patrick Dennis, *Andersonville*, *A Single Pebble* by John Hersey, *A Thing of Beauty* by A. J. Cronin, *The Mandarins* by Simone de Beauvoir, *The Ninth Wave* by Eugene Burdick and *Charmed Circle* by Susan Ertz.

In nonfiction a 1951 "sleeper" entitled *Arthritis and Common Sense* by Dan Dale Alexander flared to top popularity in 1956 through recommendation of a television program. Following it were *Profiles in Courage* by John F. Kennedy, *Eisenhower: The Inside Story* by Robert J. Donovan, *How to Live 365 Days a Year* by John A. Schindler, *The Nun's Story* by Kathryn Hulme, *The Mind Goes Forth* by Harry Overstreet and Bonaro Wilkinson (Overstreet), *Love or Perish* by Smiley Blanton, *Guestward Ho!* by Barbara Hooton and Patrick Dennis (the latter of *Auntie Mame* fame), *Youth* by Arnold L. Gesell, and *Roosevelt: The Lion and the Fox* by James Burns.

Book Sales.—The *Publishers' Weekly*, in its annual 1956 fall announcement number, reported that U.S. publishers were enjoying "their fourth consecutive year of general prosperity." Of 72 publishers answering its questionnaire, 54 reported that business for the first six months of 1956 was better than it had been in a comparable period in 1955. The only two publishers reporting lower sales were firms that had spectacular best sellers early in 1955.

The preliminary report from the 1954 U.S. Census of Manufactures was released in Sept. 1956. These still partly tentative figures about book publishing and production showed an increase of 44% in total sales of books and pamphlets by publishers and others between 1947 and 1954. Prior to this 1954 survey, the last Census of Manufactures covered the year 1947. In this interim period the American Book Publishers council and the American Textbook Publishers institute had had industry figures prepared which in some instances differed from the Census of Manufactures because of varying bases for compiling data.

The census data indicated a preliminary figure of the dollar volume of books and pamphlets sold by publishers in 1954 to be more than \$658,576,000 compared with \$445,790,000 in 1947. Book sales alone were reported to be \$621,696,000 in 1954 as against \$435,134,000 seven years before.

The total number of books sold in 1954, according to the preliminary census report, was 704,712,000, representing \$621,696,000. Of this total adult trade books in original editions totalled 43,765,000 copies worth \$75,280,000, of which 31,301,000 were hard-bound (worth \$70,304,000) and 12,464,000 were paper-bound (worth \$4,976,000). Reprint editions of adult trade books totalled 157,044,000 copies for which \$71,890,000 was received. Of these 41,121,000 were hard-bound (worth \$46,621,000) and 115,923,000 were paper-bound (selling for \$25,269,000). It should be noted that differences between census and industry estimates of paper-bound books might bring about a revision of these figures. Adult trade book sales, originals and reprints, hard-bound and paper-bound, showed a 113% increase in dollar sales. The number of copies of original editions of adult trade books, hard-bound and paper-bound, showed a 34% increase.

Juveniles (excepting toy books) hard-bound and paper-bound, original and reprint editions, totalled 220,114,000 representing \$50,835,000. This showed an increase in dollar receipts from 1947 to 1954 of more than 150%, according to the census survey, and the number of copies sold had tripled.

According to the preliminary census figures, textbooks increased in dollar income in the years between 1947 and 1954 by

43%, with school workbooks more than doubling in dollar value. Sales of technical and related books reportedly rose 37% in dollar volume though the increase in number of copies sold was less than 10%.

Dollar sales of Bibles and Testaments more than doubled, 1947 to 1954, according to the census survey, while the number of copies sold in this category increased not quite 23%.

No recent figures were available on retail book sales.

Book Prices.—According to the *Publishers' Weekly* report published Dec. 31, 1955, there was a negligible increase in the average retail price of novels during 1954-55, a 14% rise in the average price of biographies, and a 4.5% rise in the average history book price.

Average retail prices	1955	1954	1953	1952	1951	1950	1949	1941
Novels	\$3.53	\$3.50	\$3.29	\$3.26	\$3.03	\$3.02	\$2.86	\$2.58
Biography	5.03	4.40	4.67	4.66	4.03	4.47	3.98	3.30
History	5.81	5.56	6.04	5.45	5.68	5.21	5.06	3.89

(Not counted among novels tabulated were mysteries, westerns, science fiction and anthologies.)

Paper-Bound Books.—The 1954 preliminary figures from the Census of Manufactures give 128,387,000 as the number of copies of paper-bound books sold in that year, of which 12,464,000 were original editions and 115,923,000 were reprints. This figure was 52,000,000 below the industry's estimated figures, which had run as high as 240,000,000 paper-bound books distributed in 1953 and 300,000,000 in 1955. The census reported a dollar total of \$30,245,000 for these books, which was some \$3,000,000 below the industry's own estimate. The catalogue of *Paperbound Books in Print* listed 5,400 titles available in about 80 paper series in its fall 1956 issue, as compared with 4,500 titles from 40 publishers in its first issue in the summer of 1955.

(See also AMERICAN LITERATURE; ENGLISH LITERATURE; etc.)

(A. J. RR.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*The Book* (1955); *Printing Through the Ages* (1950); *Writing Through the Ages* (1950).

Books: see BOOK PUBLISHING AND BOOK SALES; CHILDREN'S BOOKS; LITERARY PRIZES; see also under AMERICAN LITERATURE; ENGLISH LITERATURE; FRENCH LITERATURE; JEWISH LITERATURE; etc.

Borneo: see BRITISH BORNEO; INDONESIA.

Boston. Boston, the capital city of the commonwealth of Massachusetts, was founded in 1630 and was incorporated by an act of the legislature of Massachusetts in 1822. The municipal government of Boston is administered by a mayor, a city council of nine members and a school committee of five members. The mayor is elected for a four-year term, and city council and school committee members are elected at large for terms of two years.

The population of Boston, according to the 1950 federal census, was 801,444, and the land area of the city is 47.81 sq.mi. The city is located in Suffolk county on the Atlantic coast and has excellent harbour and shipping facilities.

The gross funded debt of the city was \$120,778,500 as of Sept. 30, 1956. Sinking fund provisions had been made to meet these obligations in the amount of \$65,759,503, leaving a net funded debt of \$55,018,997. The 1956 tax rate was \$78.70 per \$1,000 of assessed valuation and was levied on real estate and personal property evaluated at \$1,517,808,000. The total tax levy for 1956 was \$119,451,490. The number of municipal employees as of Feb. 1, 1956, was 22,904.

The enactment by the legislature of the commonwealth of Massachusetts of a statute creating the Massachusetts Port authority was the most outstanding and significant development of concern to Boston and the metropolitan area during the year. The legislation brought together under one supervisory authority

and ownership properties owned by the city, state and private individuals. Properties involved were the Sumner Traffic tunnel, a two-lane vehicular traffic tube, running beneath Boston harbour between Boston proper and East Boston; the Logan airport, a state-owned air facility in East Boston; wharves, warehouses and docking facilities of the Boston Port authority, also state-owned; and the Mystic River bridge, a privately owned two-level vehicular bridge crossing between Boston and Chelsea. In addition to acquiring the above-named properties, the authority was also to construct an additional vehicular crossing between Boston proper and East Boston.

The Massachusetts Port authority was created a body politic and corporate and constituted a public instrumentality having the exercise of broad powers. Among the powers conferred was the right to issue revenue bonds, the proceeds of which would be used in payment for the acquisition of the properties described above and the construction of another traffic tunnel. The revenue bonds issued were payable solely from the receipts from tolls, rates, fees, rentals and other charges for the use of any project under the control of the authority and did not constitute a debt or a pledge of the faith and credit of either the city of Boston or the state.

Another significant development in Oct. 1956 was the taking over by the Metropolitan District commission, a subdivision of the state government, of ten miles of city roads. The acquisition of these highways and others taken over in 1949 completed an arc-shaped pattern of boulevards extending from the mouth of the Neponset river, Dorchester, around Jamaica pond, to the Charles river basin, Back Bay. The roadways transferred were located in Dorchester, Hyde Park, Roxbury, Jamaica Plain and the Back Bay, all sections of the city of Boston. Upon completion of expressways through downtown Boston and Dorchester, Boston would be completely circled by a state-Metropolitan District commission belt line of highways. (J. P. Lv.)

ENCYCLOPEDIA BRITANNICA FILMS.—Massachusetts (1955).

Botany. The golden anniversary of the Botanical Society of America was celebrated in 1956 at its annual meeting held at the University of Connecticut. Some time was devoted to a review of past accomplishments in botany, but for the most part, the society members were concerned with matters which promised to be of significance in the coming half century.

During the year plant physiologists and horticulturalists focused their attention on growth regulators, particularly on a new group known as gibberellins. These substances, which were isolated initially from the fungus *Gibberella fujikuroi*, resemble auxin in promoting stem elongation, respiration and possibly water uptake, but they lack other actions attributed to auxins and are not inhibitory at higher concentrations. P. W. Brian and A. G. Hemming using gibberellic acid increased to normal the stature of genetically dwarfed peas, and B. O. Phinney obtained similar effects with four of six dwarf mutants of maize which would not respond to auxin. The gibberellins also are able to eliminate the cold requirement for flowering in *Hyoscyamus niger* according to A. Lang, while A. M. Kofranek and B. O. Phinney demonstrated that the same substances hasten the flowering of China asters. These various effects are of both practical and theoretical importance, hence it is significant that Phinney was able to extract substances with similar properties from the tissues of higher plants. (See also BIOCHEMISTRY.)

Meanwhile O. V. S. Heath and J. E. Clark were able to duplicate auxin promotion of cell elongation and inhibition of root growth with chelating agents. The effects of auxin and EDTA (a chelating agent) were additive although some interaction occurred in the case of root growth inhibition. The authors speculated that auxin action may involve chelation, especially with Cu⁺⁺

or Co⁺⁺. This work became particularly interesting in view of the promotion of auxin action by cobalt which had recently been examined by K. V. Thimann and of the demonstration by W. R. Briggs and M. Ray that tyrosinase, a copper-requiring enzyme system, is able to inactivate auxin.

The association of scopoletin with differentiation was reinforced by Katharine Tryon's observation that cultures of tobacco callus which formed differentiated shoots contained much more of this lactone than did undifferentiated cultures. Another group of compounds, the leucoanthocyanins, were implicated in growth regulation when F. C. Stewart and E. M. Shantz found them among the constituents of coconut and buckeye endosperm which promote cell division in tissue cultures.

The study of the origin of cultivated plants continued to occupy a number of investigators. New taxonomic scoring methods developed largely by Edgar Anderson, as well as cytogenetics, were widely used. The bread wheats are hexaploids with three distinct sets of chromosomes. It had been well-established that one set of chromosomes comes from *Aegilops squarrosa* and a second set from the diploid einkorn wheats but there had been no agreement as to the source of the third set. On the basis of morphological comparisons P. Sarkar and G. L. Stebbins came to the conclusion that the third set comes from the wild grass *Aegilops speltoides* of Asia Minor. The possible role of the wild *Cucurbita lundelliana* of South Mexico and Central America in the origin of the five cultivated cucurbit species (squashes, gourds and pumpkins) was pointed out by T. W. Whitaker. The five cultivated species are for the most part cross-incompatible but it is remarkable that all five have been found to be cross-compatible with *C. lundelliana*. The major source of the cultivated banana is supplied by *Musa acuminata*, according to N. W. Simmonds and K. Shepherd. Previously it had been assumed that *M. balbisiana* was also a direct source of the cultivated bananas but this hypothesis offered difficulties since no edible diploid forms of this species are known. Simmonds and Shepherd suggested that the latter species has contributed to the evolution of the bananas only through hybridization with *M. acuminata*. The taxonomy and origin of the potato, *Solanum tuberosum*, was further clarified by the work of J. W. Hawkes. He concluded that *S. tuberosum*, a polyploid, was derived from a cultivated diploid species, possibly *S. stenotomum*.

The vascular plants were long considered to have originated in post-Cambrian times, but in recent years small fragments of wood and spores recovered from Cambrian sediments suggested the occurrence of vascular plants in the Cambrian. Skepticism as to the actual presence of vascular plants in that period remained until Kryschtowitch in 1953 discovered a lycopodiaceous plant in the Middle Cambrian of East Siberia. In commenting on this discovery S. Leclercq pointed out that this lycopsid is structurally more complex than any of the Psilophytales which had long been thought to be the most primitive vascular plants and occurs at an earlier horizon than any known members of the latter group. He further pointed out the great differentiation of the new fossil suggests a long evolutionary history for the lycopsids and definitely separates the origin of the lycopsids from that of the Psilophytales.

Further investigation of several destructive plant diseases led to observations which might aid in their eventual control. It was thought that squirrels might be important vectors of the oak wilt disease which threatens oaks throughout the nation. E. B. Himelick and E. A. Curl observed that gray and fox squirrels tear bark from infected oaks to feed on fungal "mats" beneath. Subsequent gnawing of healthy plants results in infection.

The agent of the disease "wildfire" of tobacco (*Pseudomonas tabaci*) damages its host, according to A. C. Braun, through the release of a toxin which interferes competitively with the utiliza-

tion of the amino acid methionine. The toxin is structurally similar to methionine.

Smog damage to plants was previously attributed to the action of ozone on unsaturated hydrocarbons released by industrial processes and by natural decomposition of leaves. L. C. Erickson and R. T. Wedding demonstrated that ozonated hexene can reduce photosynthesis, stimulate respiration and alter semipermeability, thus accounting in large measure for the deleterious effects of smog.

New Books.—*Plant Taxonomy*, by Earl L. Core; *Chromosome Botany*, by C. D. Darlington; *Chromosome Atlas of Flowering Plants*, by C. D. Darlington and A. P. Wylie; *Trees, Woods and Man*, by H. L. Edlin; *Modern Methods of Plant Analysis*, by K. Paech and M. V. Tracy.

(See also PALAEOLOGY.)

(C. W. HN.; C. B. HR.)

Arboretums and Botanical Gardens.—*United States.*—Increased public interest in arboretums was shown throughout the United States in 1956. Longwood gardens at Kennett Square, Pa., the former estate of Pierre S. du Pont, adopted a vigorous program of lectures and displays to encourage the public to view this 1,000-ac. wonderland of plants growing both outdoors and in the largest greenhouse display area in the world.

Kingwood Center of Mansfield, O., although it had been open to the public as a garden centre for only three years, also started an extensive program of planting (about 130,000 Dutch bulbs) and attracted more than 225,000 persons in 1955. More than 800 meetings and tours were scheduled during the same period.

The city of Denver, Colo., adopted a budget for its new arboretum and appointed as its first director Robert L. Woerner, formerly of the Finch arboretum in Spokane, Wash. Plans were proceeding to begin the actual planting of this new arboretum.

Planting Fields foundation at Glen Cove, L.I., N.Y., approved plans and supplied the necessary funds to make a landscape plan, employ a full-time horticulturist and expand the inadequate water system in this beautiful, formerly private estate.

One of the most serious freezes on record occurred in Nov. 1955 in the Pacific northwest which affected all the arboretums and botanical gardens in the area. Thousands of plants had to be cut down or removed entirely from the University of Washington's arboretum at Seattle; rhododendrons and camellias, some 15 years old, were killed.

(D. WN.)

Great Britain.—On Oct. 1, 1956, George Taylor succeeded Sir Edward Salisbury as director of the Royal Botanic gardens, Kew. Work continued during 1956 on the reconstruction of several botanical houses. E. Milne-Redhead and P. Taylor of the Herbarium returned to England on Aug. 13 after making extensive collections in south Tanganyika. Work continued on the *Flora of Tropical East Africa*, the revised edition of the *Flora of West Tropical Africa* and the *Flora of Cyprus*. The new *Flora Zambesiaca*, covering plants of the Central African federation, Mozambique and Bechuanaland, was started, being sponsored by the governments of those countries and by the colonial office.

At the University Botanic garden, Cambridge, Eng., the extension and development of the garden made possible by the Reginald Cory fund was continued. The 20 ac. set aside for incorporation with the garden were cleared, and construction progressed in the laying out of this area. Work on the new rock garden continued, construction of a new laboratory was started, and planting was begun. Taxonomic research continued at the Royal Botanic garden, Edinburgh, Scot. In addition to a check list of the cultivar names of *Rhododendron* (including *Azalea*) compiled by H. R. Fletcher, the assistant keeper, members of the scientific staff worked on the following families and genera: Cintractia, Compositae, Gesneriaceae, Labiatae, Oleaceae and *Rhododendron*. The herbarium of cultivated plants was considerably expanded, and thinning out, replanting and relabelling

were continued. During July and August D. M. Henderson accompanied an expedition to central and northern Spain.

(See also HORTICULTURE.)

(F. N. HR.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Flowers at Work* (1955); *Fungus Plants* (1931); *A Parasitic Plant* (1931); *Plant Growth* (1931); *Plant Trap* (Insect Catchers of the Bog Jungle) (1955); *Roots of Plants* (1931); *Seed Dispersal* (1931).

Bowles, Chester

(1901—), U. S. author and lecturer, was born on April 5 in Springfield, Mass. He attended Choate school and Yale university, graduating in 1924, worked for a year on the *Springfield Republican* and four years in a New York advertising firm. In June 1929, in partnership with William Benton (*q.v.*), he started the advertising firm of Benton and Bowles, Inc., and in 1936 he became chairman of its board of directors.

In June 1942 he was appointed district director of the Office of Price Administration for the state of Connecticut. Pres. Franklin D. Roosevelt named him national OPA administrator in 1943, and in 1946 Pres. Harry S. Truman made him director of economic stabilization with responsibility for all anti-inflation wage, price and production controls.

In Nov. 1946 Bowles was appointed a U.S. delegate to the first conference of the United Nations Educational, Scientific and Cultural organization in Paris, Fr., and in 1947 he became international chairman of the United Nations Appeal for Children. He was elected governor of Connecticut in Nov. 1948. During the two years of his administration he introduced legislation providing for expansion of public education, housing, welfare and child care programs, labour legislation and reorganization of the state government. He was defeated for re-election in 1950.

President Truman appointed Bowles U.S. ambassador to India and Nepal in Sept. 1951. After the election of Pres. Dwight D. Eisenhower, however, he resigned as ambassador and returned to the United States in early 1953.

Author of *Tomorrow Without Fear* (1946) and the best seller *Ambassador's Report* (1954), he has lectured and written widely in America and travelled extensively in Africa and India. Two later books, *American Politics in a Revolutionary World* and *Africa's Challenge to America*, embodying lectures delivered at Harvard university and the University of California, were of special significance in connection with the 1956 political campaign. A further volume entitled *The New Dimensions of Peace* provided a complete review of the world political scene and was widely acclaimed as a major contribution to the literature of American diplomacy.

(R. R. R. B.)

Bowling.

Bill Lillard of Chicago, Ill., added a page to bowling history in 1956 when he became the first kegler ever to win three titles in one American Bowling congress (A.B.C.) championship tournament. Lillard's 3-game series of 683 helped the Falstaff Beer team gain five-man team honours with 3,092. He scored 674 when paired with Stan Gifford, another Chicagoan, to win the doubles at 1,331, and captured the all-events title with a total of 2,018. When bowling in the 79-day competition at the Rochester (N.Y.) War Memorial building came to a close on May 20, Lillard had earned \$2,180.75 in prizes, a record total for a singles A.B.C. championship competition. George Wade of Steubenville, O., took first place in singles competition with games of 258, 247 and 239 for his winning total of 744. Lillard also was the first bowler ever to win an A.B.C. title and the all-star match-game championship within one year. He dethroned Joe Wilman of Chicago in the all-star championships in Dec. 1955. The Falstaff five also took the Frank Pasdeloup trophy, scoring 9,176 for the all-events, being the only team to go over 9,000.

In the sixth annual masters' tournament held near the close of

the A.B.C. tournament at Rochester, Dick Hoover of Akron, O., was victor, defeating Ray Bluth of St. Louis, Mo., 819-787, in a four-game finale.

Membership in the A.B.C. continued its steady upward trend, the 1955-56 season showing a 17% rise in certified teams, which totalled 439,198. The number of sanctioned leagues rose 19% to 48,149. No one had qualified for admission to the Bowling Hall of Fame in 1956 for the first time in the 15-year history of the hall.

Johnny King of Mayfield Heights, O., who won the National Bowling league television series at Paramus, N.J., in July, gained \$7,500 in additional prizes in the George London tourney at Chicago in September. King defeated Joe Brown of Jersey City, N.J., in the championship match on Sept. 11 with 15.44 Petersen points on a 644 series. Brown rolled 565 for 11.15 points.

The annual championship of the Woman's International Bowling congress was held at Miami, Fla., and ran for 32 days. Doris Knechtges of Detroit, Mich., carried home the all-events laurels for the second time with a score of 1,867. The top singles prize was won by Lucille Noe of Columbus, O., who bowled games of 207, 256, and 245 for a winning total of 708. Betty Maw and Mary Quinn, Buffalo (N.Y.) pair, triumphed in the doubles with 1,242. The team honours were captured by the Daniel Ryan five of Chicago with a 2,880 score.

Duckpins.—The National Duckpin Bowling congress conducted its tourney at Charlotte, N.C., in April and the meet attracted an entry of 832 teams. In the national rankings for 1956,

National Duckpin Champions

Men's singles—Al Burrell, Atlanta, Ga.	430
Men's doubles—August Recchia and Chester Becker, Baltimore, Md.	777
Men's all-events—August Recchia, Baltimore	1,200
Men's team—Arrow "77," Baltimore	1,900
Women's singles—Betty Mooney, Baltimore	391
Women's doubles—Lora Farmer and Helen Lawrence, Richmond, Va.	757
Women's all-events—Betty Mooney, Baltimore	1,137
Women's team—New Essex, Baltimore	1,737
Mixed doubles—Pearl Heim and George Young, Baltimore.	809

James Dietsch of Baltimore, Md., placed first among the men while Mrs. Elizabeth Barger of Baltimore, Md., led the women's list for the ninth time in the last ten years. (T. V. H.)

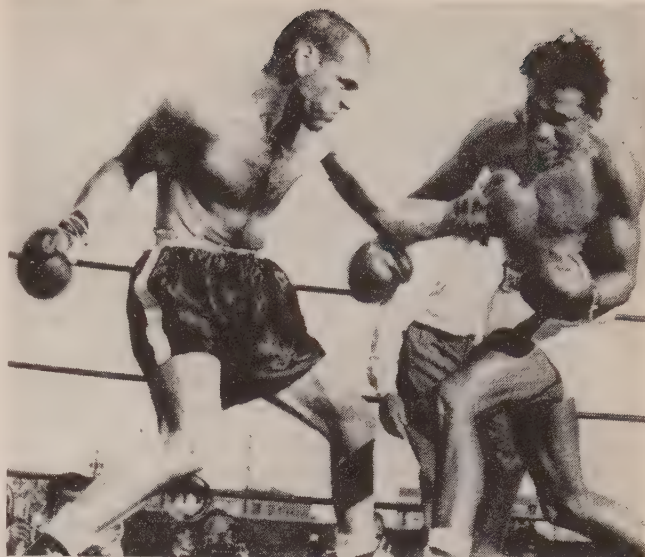
Bowls: see LAWN BOWLING.

Boxing. Boxing in the United States continued on a steady keel during 1956, despite widespread investigations, notably in New York, Pennsylvania and California; the retirement, as undefeated world heavyweight champion, of Rocky Marciano; and the fact that for the first time in a number of years no big summer outdoor shows were held in New York city, once the stronghold of boxing.

World Championship Matches.—With the voluntary relinquishing of the heavyweight crown by Rocky Marciano on April 27, 1956, an elimination series was held to determine his successor. Floyd Patterson and Archie Moore, world light heavyweight champion, were the finalists, a bout between them, however, being held off because of an injured hand suffered by Patterson in his winning fight against Tommy (Hurricane) Jackson. The match was finally held at Chicago, Ill., on Nov. 30, and Floyd Patterson knocked out Archie Moore in the fifth round to become the new heavyweight champion of the world.

Archie Moore successfully defended his 175-lb. title by stopping Yolande Pompey of the British West Indies in the tenth round at the Harringay arena, London, Eng., on June 5. Moore later (July 25) knocked out James J. Parker, Canadian heavyweight champion, in a bout in Toronto, Ont., which was advertised as for the world heavyweight championship but which was merely another elimination contest.

Ray Robinson defended his world middleweight title once,



"SUGAR" RAY ROBINSON (right) dodging a blow by "Bobo" Olson in their middleweight championship fight at Los Angeles, Calif., May 18, 1956. A few seconds after this picture was made Robinson knocked out Olson to regain the title

knocking out Carl (Bobo) Olson in the fourth round on May 18 at Wrigley field, Los Angeles, Calif. A crowd of more than 20,000 paid \$228,500 to view the fight.

Johnny Saxton regained the world welterweight title he had lost the year previously by outpointing Carmen Basilio over 15 rounds at Chicago stadium, Chicago, Ill., on March 14. The fight grossed \$104,288. In a return bout, on Sept. 12, at War Memorial stadium, Syracuse, N.Y., Basilio rewon the welterweight title by knocking out Saxton in the ninth round.

Joe Brown won the world lightweight championship by gaining a split 15-round decision over Wallace (Bud) Smith, the titleholder, at New Orleans, La., on Aug. 24.

Sandy Saddler retained his world featherweight title by a technical knockout of Gabriel (Flash) Elorde of the Philippines in the 13th round on Jan. 18 at the Cow Palace, San Francisco, Calif. Saddler was later injured in an automobile accident which kept him inactive for a short while.

Mario d'Agata of Italy, a deaf-mute, won the world bantamweight championship by stopping Robert Cohen at the end of the sixth round on June 29 at the Foro Italico, Rome, It. D'Agata was the first deaf-mute ever to win a world boxing championship.

Pascual Perez of Argentina, the world flyweight champion, defended his title three times, winning a 15-round decision from Leo Espinosa of the Philippines at Buenos Aires, Arg. (Jan. 11), winning over Oscar Suarez of Cuba by a technical knockout in 11 rounds at Montevideo, Urug. (June 30), and stopping Ricardo Valdez in five rounds at Tandil, Arg. (Aug. 3).

Boxing Hall of Fame.—Seven new members were elected to the Boxing Hall of Fame in 1956. The Hall of Fame was inaugurated in 1954 by the *Ring* magazine and is housed in the *Ring* museum in Madison Square Garden. The board of directors voted in one pioneer of the game, Peter Jackson. The Old Timers' committee elected two, George Dixon and Jem Driscoll. The modern group named four, Tony Canzoneri, Barney Ross, Tommy Loughran and Jimmy McLarnin.

The following is a complete list of those who had been elected to the Hall of Fame:

Pioneer Group.—James Figg, Tom Cribb, Jem Mace, Tom Sayers, Gentleman John Jackson, Arthur Chambers, John C. Heenan, William Richmond, Nonpareil Jack Dempsey, Jack Broughton, Daniel Mendoza, Tom Hyer, Young Griffo, John Morrissey, John L. Sullivan, Jack McAuliffe, William Thompson (Bendigo) and Peter Jackson.

Old Timers' Group.—Stanley Ketchel, Jack Johnson, James J. Corbett, Terry McGovern, Abe Attell, George Dixon, Joe Gans, Bob Fitzsimmons,

James J. Jeffries, Sam Langford, Joe Walcott and Jem Driscoll.
Modern Group.—Jack Dempsey, Henry Armstrong, Harry Greb, Joe Louis, Mickey Walker, Gene Tunney, Benny Leonard, Tony Canzoneri, Jimmy McLarnin, Barney Ross and Tommy Loughran.

Amateur Boxing.—With 1956 an Olympic year, much stress was placed on the amateur boxing tournaments, many of the individual winners gaining berths on the United States team which fought for world honours in Melbourne, Austr., in November. (See OLYMPIC GAMES.) In the 69th annual national Amateur Athletic union championships, held in Boston, Mass., in April, individual champions were: 112-lb., Albert Pell, New York city; 119-lb., Don Whaley, Cincinnati, O.; 125-lb., Harry Smith, New York city; 132-lb., Bill Cherry, Cleveland, O.; 139-lb., Tommy Thomas, Portland, Ore.; 147-lb., Jackson Brown, Chicago, Ill.; 156-lb., Frank Davis, Ft. Wayne, Ind.; 165-lb., Paul Wright, Flint, Mich.; 178-lb., John Horne, Omaha, Neb.; heavyweight, Jim McCarter, Seattle, Wash.

In the 19th annual National Collegiate Athletic association championships, held at Madison, Wis., in April, individual champions were: 112-lb., Dean Plemmons, University of Wisconsin; 119-lb., Choken (Mike) Maekawa, Michigan State university; 125-lb., Bobby Soileau, Louisiana State university; 132-lb., Richard Rall, Washington State college; 139-lb., Dick Bartman, Wisconsin; 147-lb., Gil McLane, Louisiana State; 156-lb., Vince Ferguson, Wisconsin; 165-lb., Roger Rouse, Idaho State college; 178-lb., Orville Pitts, Wisconsin; heavyweight, Truman Sturdevant, Wisconsin. The University of Wisconsin won its eighth N.C.A.A. title, rolling up an unprecedented 47 points.

In the 29th annual intercity (East v. West) Golden Gloves championships, held at Madison Square Garden on March 21, the New York (East) team won, 6-2. Individual champions were: 112-lb., Peter Melendez (Chicago) defeated Jose Rigores (New York); 118-lb., Albert Pell (New York) defeated Vince Doniero (Chicago); 126-lb., Vincent Breen (New York) defeated Ken Morris (Chicago); 135-lb., Joe Shaw (Chicago) defeated Thomas Schafer (New York); 147-lb., Richard Hall (New York) defeated Leon Brooks (Chicago); 160-lb., Juan Pomare (New York) defeated Willis Anderson (Chicago); 175-lb., Alonzo Johnson (New York) defeated Ernie Terrell (Chicago); heavyweight, John Harper (New York) defeated Booker Staton (Chicago). (N. FL.)

Great Britain.—During 1956 two British world championship prospects, welterweight Peter Waterman and light-heavyweight Yolande Pompey, had their hopes dimmed when they were defeated by U.S. boxers Kid Gavilan and Archie Moore, respectively.

In 1956 the Frenchman Robert Cohen lost his world bantamweight championship to the Italian deaf-mute Mario D'Agata. At the invitation of the Italian boxing authorities this bout was refereed by E. J. Waltham, secretary of the British Boxing Board of Control.

During the year the British heavyweight champion Don Cockell followed Rocky Marciano's example and retired from boxing. The vacant title was won by Cardiff boxer Joe Erskine in August, when he outpointed his fellow Welshman Johnny Williams. Unfortunately Erskine suffered badly cut eyes, which seemed likely to prevent him from boxing again for some time. Eye trouble also caused the retirement from the game of British light-heavyweight champion Ron Barton. A spate of cut eyes had plagued British boxing of late and Wally Thom, who lost his British welterweight title to Peter Waterman, announced his retirement mainly on this account.

Protracted negotiations for Dai Dower to meet Pascual Perez, the Argentinian, for the latter's world flyweight title were unsuccessful.

(W. B. DV.)

Boy Scouts: see SOCIETIES AND ASSOCIATIONS, U.S.

Brattain, Walter Houser (1902-), U.S. physicist, shared the 1956 Nobel physics prize with William B. Shockley and John Bardeen (*qq.v.*) for perfecting the transistor—a tiny, sturdy and efficient substitute for the vacuum tube in electronic devices. Brattain and Bardeen jointly invented the point-contact type of transistor, with Shockley as the directing theorist and team captain, in the Bell Telephone laboratories at Murray Hill, N.J.

Born on Feb. 10, 1902, at Amoy, China, where his father was a teacher, Brattain took his bachelor's degree at Whitman college, Walla Walla, Wash., in 1924; his master's degree at the University of Oregon in 1926 and his doctorate at the University of Minnesota in 1929. After a year (1928-29) with the U.S. bureau of standards in Washington, D.C., he joined the staff of the Bell Telephone laboratories in 1929 as a research physicist. During World War II he was engaged in secret weapons research at Columbia university. He was awarded the Franklin institute's Stuart Ballantine medal in 1952.

During the years following invention of the transistor in 1948 the device found numerous uses in such applications as radio and television receivers, high-speed computers, telephone amplifiers, electronic switchers, data transmitters and automatic control devices. It is a semiconductor about the size of a shoelace tip made of such materials as silicon, germanium and certain metallic oxides. They conduct electricity by means of free electrons passed on from one atom to the next.

Brazil. A federal republic in eastern and central South America, with an area of 3,287,195 sq.mi., Brazil is second in size only to Canada in the western hemisphere. Language: Portuguese. Religion: predominantly Roman Catholic with about 1,500,000 Protestants of various denominations (mostly Methodists, Presbyterians and Baptists), and about 500,000 Spiritualists. Chief cities: Rio de Janeiro, the federal capital (1955 est. pop.), 2,725,274; São Paulo (1953 est. pop.), 2,500,000; Recife, 560,000; Salvador, 460,000; Porto Alegre, 440,000; Belo Horizonte, 430,000; Fortaleza, 300,000; Belém, 275,000.

The total population of the country, which at the time of the 1950 census numbered 51,976,357, was estimated at 60,080,341 in 1956, mostly concentrated along the coast.

The president in 1956 was Nereu Ramos (until Jan. 31); then Juscelino Kubitschek de Oliveira.

History.—At the time of his inauguration, President Kubitschek was confronted with the pressing problems of how to reduce the government's heavy indebtedness, fight inflation, increase the national productivity and, at the same time, conciliate his political antagonists. In his first message to congress, he called attention to the country's financial and economic difficulties, pointing out as its causes: the slowing down of the country's economic growth; lower prices for Brazil's export products, principally coffee, cocoa, and cotton; inflation; and budgetary deficits.

As the year started the cruzeiro, the national unit of currency, continued steadily to decline in purchasing power as well as in terms of foreign currencies. The decline of its value in terms of foreign currencies was attributed mainly to the falling off of the value of exports and to the growing need of the government to acquire large amounts of dollars and other foreign currencies for foreign debt service and to pay for essential imports. Internally, the cruzeiro declined in value as a result of the government's continuing inability to balance its budget, the consequent recourse to paper money issues, the increase in prices for all commodities, and further increase in the minimum salaries as established by law.

Despite its intention to reduce government expenditures, the administration could not withstand the pressure for an increase

Area and Population of States and Territories of Brazil

(Estimates published by the Instituto Brasileiro de Geografia e Estatística, in its Boletim Estatístico, No. 54 April-June 1956)

State or territory	Area (sq.mi.)	Pop. (July 1, 1956)	Capital
North			
Acre (terr.)	58,915	143,266	Rio Branco
Amazonas	612,537	578,646	Manaus
Rio Branco (terr.)	89,058	23,140	Boa Vista
Pará	474,896	1,266,188	Belém
Amapá (terr.)	53,013	52,517	Macapá
Rondônia (terr.)	93,816	51,751	Pôrto Velho
Northeast			
Maranhão	128,252	1,842,209	São Luiz
Piauí†	97,175	1,215,086	Teresina
Ceará†	57,102	3,147,133	Fortaleza
Rio Grande do Norte	20,490	1,114,661	Natal
Paraíba	21,836	1,919,320	João Pessoa
Pernambuco	37,868	3,915,948	Recife
Alagoas	10,731	1,189,878	Maceió
Fernando de Noronha (terr.)	10	581	...
East			
Sergipe	8,505	715,833	Aracaju
Bahia	217,516	5,496,011	Salvador
Minas Gerais	224,701	8,403,617	Belo Horizonte
(Serra dos Aimorés)†	3,914	272,352	...
Espírito Santo	15,281	937,554	Vitória
Rio de Janeiro (state)	16,443	2,623,472	Niterói
Distrito Federal	524	2,852,176	Rio de Janeiro
South			
São Paulo	95,452	10,585,286	São Paulo
Paraná	77,551	2,967,016	Curitiba
Santa Catarina	36,601	1,852,257	Florianópolis
Rio Grande do Sul	109,066	4,782,089	Pôrto Alegre
Central-West			
Goiás	240,506	1,536,951	Goiânia
Mato Grosso	484,486	595,410	Cuiabá

*Former Guaporé territory. Name changed by act of congress.

†Excludes 950 sq.mi. between Piauí and Ceará not yet delimited.

‡Area in dispute between the states of Minas Gerais and Espírito Santo.

of salaries. First the armed forces, and immediately after that the federal civil workers, received salary increases which resulted in an estimated rise of Cr\$ 20,000,000.000 a year in government expenditures. This was followed in July by a presidential decree increasing the officially established minimum salary for all workers throughout the country, adding a total estimated Cr\$ 45,000,000.000 a year to private expenditures.

Despite the critical financial situation the country continued to grow. The German Mercedes-Benz company inaugurated a truck-manufacturing plant in Santo André, near the city of São Paulo, and Willys-Overland, a U.S. company, put a new stock issue on sale as part of a program to increase capitalization and build a jeep-engine plant in Brazil. A Brazilian company (Vemag) was building a plant to make DKW station wagons under German patents. General Motors, Ford, Chrysler, American Motors and the German Magyrus and Volkswagen were said to be planning increases in their production in the country which would total 68% by 1960. A large chemical industry was to be established under the name of Petroquímica. Japanese interests were looking into the planned organization of several steel companies in the states of Minas Gerais, Espírito Santo and Santa Catarina. Volta Redonda, the government-controlled steel plant, decided to increase its production, for which it received an additional loan of U.S. \$30,000,000 from the Export-Import Bank of Washington. In August the Export-Import bank also announced a loan of U.S. \$150,000,000 to Brazil to be applied to the purchase of railroad equipment, the dredging and rebuilding of ports, and the production of electric power. Other possible loans were to follow for highways, food storage facilities, fertilizer production, irrigation and power.

Following his inauguration, President Kubitschek immediately set himself to carry out his announced program of increasing the country's electric power resources, improving transportation facilities and promoting food production. The president declared that it was his intention to increase oil production from 5,000 bbl. to 90,000 bbl. a day by 1960; to increase the refining of oil from 95,000 bbl. to 175,000 bbl.; and to improve internal transportation facilities.

He intended, he said, to reorganize the government-controlled Eletrobrás holding corporation to increase the production of electric power. The transportation facilities would be developed

by the creation of a national corporation which would be given control over all national railroads and would build 1,000 additional miles of lines. He promised to build 7,000 mi. of new automobile roads and to pave 3,000 mi. of existing dirt roads.

The president announced that food production and availability would be assisted by the construction of a chain of silos and warehouses; that wheat production would be increased to at least 1,500,000 tons a year; and that a chain of packing plants would be built with a total daily capacity of 2,800 steers and 2,200 hogs.

The administration's plans were, however, considerably delayed and curtailed by a determined opposition in congress and by the difficulty in obtaining foreign capital or loans.

President Kubitschek endeavored, apparently with little success, to conciliate his political opponents by pursuing a moderate policy toward them. Agitation continued in congress and in the press for a constitutional amendment providing for the election of the president and vice president by an absolute majority of the popular vote, and for a reform of the electoral laws to restrict voting qualifications.

President Kubitschek attended the Panama conference of July. To an invitation from Argentina to participate in a South Atlantic conference to discuss the formation of a South Atlantic defense organization, Brazil replied that it would accept providing that the Reciprocal Assistance treaty of 1947 would continue to be implemented.

On Sept. 6 President Kubitschek cancelled the 1955 United States-Brazil agreement to co-operate in exploring in Brazil for deposits of radioactive minerals. This decision apparently was taken by recommendation of the National Security council under the influence of extreme nationalist elements. Still in effect, however, was the Atoms for Peace agreement under which the United States promised to provide Brazil with 13.2 lb. of uranium reactor fuel and to donate U.S. \$350,000 toward the cost of a research reactor.

On Sept. 19 the congress adopted legislation providing for the transfer of the federal capital to the interior state of Goiás. A committee was to be appointed to formulate detailed plans for the new capital. A government-controlled corporation was to be organized to buy and sell land in the new federal district and to be in charge of the actual construction work. The new capital was to be built in a previously-selected area near Planaltina, in the highlands of southern Goiás. It was the announced intention of President Kubitschek to move the capital to Goiás before 1961. The new capital was to be called Brasília.

(See also FOREIGN INVESTMENTS.)

(R. D'E.)

Education.—In 1952 there were 84,254 elementary school units with 5,651,564 pupils, (1954) 2,485 secondary schools with 535,775 pupils, 795 commercial schools with 97,531 pupils, 598 superior schools with 64,645 pupils and 796 normal schools with 59,521 pupils. There were 11 universities, of which 3 were private (Catholic), 7 state and 1 federal (University of Brazil at Rio de Janeiro). According to the 1950 census, 51.4% of those 10 yr. of age and over were illiterate.

Finance.—The monetary unit is the cruzeiro (Cr\$), valued at 5.31 cents U.S. currency, official rate, during 1956, and at 1.32 cents, free rate, on July 30, 1956. After Oct. 16, 1953, the official rate was used only for government imports and exports of a few essentials. An auction system was used for the sale of foreign exchange for most private imports. Under this system exchange was allotted to five auction categories according to the essentiality of the goods to be imported, and the rates paid at the auctions had to be added to the official selling rate, with applicable taxes, to secure the effective selling rates. The fluctuating free-market rate was used for most capital and nontrade transactions.

The 1956 budget as approved by congress called for revenue of Cr\$ 70,-960,000,000 and expenditure of Cr\$ 71,505,000,000. Actual revenue in 1955 (preliminary) was Cr\$ 55,671,000,000; expenditure, Cr\$ 63,287,000,000. The consolidated federal external debt on Dec. 31, 1955, was \$12,561,-890, U.S. \$57,717,345, 32,976,150 French paper francs and 20,372,500 gold francs; funded internal debt, Cr\$ 10,558,088,000; floating debt (excluding the debt to social security institutes), Cr\$ 34,900,000,000. Currency in circulation (Jan. 31, 1956) was Cr\$ 56,100,000,000; demand deposits, Cr\$ 122,800,000,000. The U.S. department of commerce estimated U.S. direct private investments in 1955 at \$1,107,000,000, of which \$563,000,000 represented investments in manufacturing. National income in 1954 was estimated at Cr\$ 442,500,000,000. The cost-of-living index (São Paulo) stood at 167 in March 1956 (1953=100).

Trade and Communications.—Exports in 1955 totalled U.S. \$1,423,247,-

ooo: imports, \$1,306,835,000. Leading exports were coffee (59%), raw cotton (9%), cacao (6%), pine wood (4%) and sugar (3%). Leading import groups were raw materials (32%), machinery and vehicles (29%), foodstuffs and beverages (14%) and chemicals and drugs (12%). Leading customers were the U.S. (42%), Germany (7%), Argentina (7%), the U.K. (4%) and France (4%); leading suppliers, the U.S. (24%), Argentina (12%), Germany (7%), the Netherlands Antilles (6%) and France (5%).

Railway mileage (Dec. 31, 1954) was 23,104; in 1954, an estimated 349,522,000 passengers and 37,118,000 metric tons of freight were carried. Highways and roads totalled 225,000 mi. on Dec. 31, 1954. On Dec. 31, 1955, there were 374,498 automobiles, 333,793 trucks and 26,217 buses. In 1955 Brazilian air lines flew an estimated 70,287,000 mi. and carried 2,988,724 passengers. According to *Lloyd's Register of Shipping*, the merchant marine had 396 vessels (100 tons and over) aggregating 892,823 gross tons on June 30, 1955. Telephones (Jan. 1, 1955) totalled 745,617, of which 82.6% were automatic.

Agriculture.—Coffee production in the 1955-56 season (preliminary figures) totalled 23,500,000 bags of 132 lb. each; exports in 1955 were 13,696,000 bags, of which 7,831,000 bags went to the U.S. and 687,000 bags to Germany. Preliminary official estimates for other crops in 1955 (in metric tons) included cotton (ginned) 406,000, cacao 162,000, wheat 983,000, maize 6,906,000, rice (rough) 3,920,000, cassava 14,535,000, potatoes 864,000, bananas 213,000,000 (stems), sugar 2,073,000, sisal 98,000, leaf tobacco 141,000, peanuts 219,000, cottonseed 766,000.

Livestock estimates (Dec. 31, 1954) showed 61,442,000 cattle, 7,286,000 horses, 35,555,000 pigs, 17,503,000 sheep and 9,481,000 goats. Forest exports in 1955 included pine wood 673,000 metric tons and carnauba wax 12,000 tons. Rubber production was about 21,500 tons.

Manufactures.—The 1950 census of industry listed 89,086 industrial establishments with 1,256,807 workers and production (1949) valued at Cr\$ 116,747,264,000, of which the food-processing industry accounted for 29%, textile 17%, chemical and drug 8% and metallurgical 7%. Preliminary production figures for 1955 included cement 2,693,000 metric tons, pig iron 1,037,000 tons, raw steel 1,132,000 tons, iron and steel sheets 1,009,000 tons. Installed electric energy capacity totalled 2,805,527 kw. on Dec. 31, 1954; production in 1954 was 10,589,807,000 kw.hr.

Minerals.—Preliminary production estimates for 1955 included coal 2,256,000 metric tons, gold 111,500 fine oz., iron ore (metal content 65%) 3,600,000 tons (exports 2,565,000 tons), manganese ore 380,000 tons (exports 177,000 tons), crude petroleum 254,000 tons (about 1,885,000 bbl.). Imports in 1955 included coal 563,562 tons, crude petroleum 3,513,056 tons, gasoline 1,070,295 tons, fuel and diesel oil 3,255,675 tons.

(J. W. Mw.)

ENCYCLOPEDIA BRITANNICA FILMS.—*Brazil* (People of the Plantations) (1940).

Bread and Bakery Products: see BAKING INDUSTRY.

Brennan, William Joseph, Jr. (1906–), U.S. jurist, was appointed associate justice of the U.S. supreme court in 1956 by Pres. Dwight D. Eisenhower to succeed Sherman Minton, who had retired because of ill health. Brennan at the time of being sworn in, on Oct. 16 at Washington, D.C., was the youngest member of the supreme court. His recess appointment was subject to confirmation by the senate in 1957.

Born at Newark, N.J., on April 25, Brennan took his bachelor's degree at the University of Pennsylvania's Wharton school of finance and commerce in 1928, and his law degree from Harvard in 1931. Admitted to the New Jersey bar in 1931, he practised law at Newark until 1949, when he was named judge of the New Jersey superior court. The next year he was appointed appellate division judge and in 1952 he was elevated to the state supreme court bench. During World War II he was a legal officer with the army's general staff, attaining the rank of colonel.

Brennan, who was President Eisenhower's third appointment to the nation's highest court, was reportedly chosen after a national poll of bar association officers and state judges by the White House. A Democrat, who had not been actively engaged in politics, and a Roman Catholic, the new justice was known for his championship of civil rights. His appointment kept the existing political balance of the supreme court at six Democrats and three Republicans.

Brewing and Beer. **Sale and Consumption.**—Beer and ale sales in the United States for the fiscal year ended June 30, 1956, totalled 85,537,000 bbl. (of 31 U.S. gal. each), the fourth highest year on record. The largest sales total was 86,992,000 bbl. in fiscal 1948.

Market trends followed the pattern of recent years, packaged beer sales achieving the highest ratio on record—78.4%. Of packaged beer sales during the 1955 calendar year, 60.6% was in

returnable bottles, 5.3% in nonreturnable (no deposit) bottles and 34.1% in cans—a new high.

Although the United States, with 90,697,000 bbl., led the world in beer and ale production, it was tied with the German Federal Republic for seventh place in per capita consumption (15.9 gal.). Belgium, with 37 gal. per person, retained its customarily wide lead, followed in order by Luxembourg, Australia, New Zealand, United Kingdom and Denmark.

As in previous years, the rate of state taxes was believed by market analysts to have influenced beer consumption in many areas of the United States. Industry prospects, at mid-1955, had looked bright for a record year, but new tax increases in several southern states apparently applied a brake to mounting sales. Wisconsin, followed by Nevada and Michigan, each with a comparatively low state tax, led the states in per capita consumption. North Carolina, Mississippi and Alabama, each with a relatively high state tax, had the lowest per capita consumption.

Taxes.—For the third consecutive year, beer was a \$1,000,000,000-a-year producer of public revenue in 1955, through payment of \$756,078,000 in federal revenue, \$216,128,000 in state revenue and an undetermined amount in local taxes.

Wages.—The census of manufactures report showed for the brewing industry a payroll of \$414,000,000 for 1954, the latest year for which figures were available in 1956. The 1956 edition of the *Brewers Almanac*, published by the United States Brewers foundation, disclosed that the average weekly earnings for brewery production workers was \$97.84, a new high, as compared with \$72.10 for all food industries and \$76.52 for all manufacturing. This represented a six-year rise of \$25.18 per week as compared with \$17.19 for all manufacturing.

Safety.—The industry-wide safety campaign, given impetus through the United States Brewers foundation-sponsored annual contest, was an important factor in reducing the industry's accident frequency to 16.8 per 1,000,000 man-hours during 1955, a reduction of 52.7% from the 35.5 per 1,000,000 man-hours in 1948, when the program was launched.

Research.—Continuous research on the art and science of brewing, the value of beer as a beverage and its contribution to human welfare was carried out in various colleges under the sponsorship of Brewing Industries Research institute. (See also LIQUORS, ALCOHOLIC.) (E. V. Lh.)

Bridge, Contract: see CONTRACT BRIDGE.

Bridges. The world's longest spans of the various types built up to 1956 are listed in the table. There was no change in the table during 1955 and 1956.

United States.—The upper deck' of the \$68,000,000 Richmond-San Rafael bridge across San Francisco bay was completed in 1956. Completion of the lower deck was scheduled for 1957. The bridge is 4 mi. long and includes thirty-six 100-ft. girder spans, thirty-six 289-ft. truss spans and two cantilever bridges. Each cantilever bridge has a 1,070-ft. centre span and two 535-ft. anchor arms.

The Tappan Zee bridge over the Hudson river between Nyack and Tarrytown, on the New York state thruway, was opened to traffic late in 1955. Total length of the bridge is 16,000 ft. The main unit is of through cantilever type with a centre span of 1,212 ft. flanked by 602-ft. anchor arms. The approaches include 20 steel deck trusses 235 to 250 ft. long with the remainder made up of 50-ft. beam spans. The over-all width of the bridge is 90 ft. between railings. This bridge has a unique engineering feature in the use of eight concrete piers of a buoyant type to reduce the dead load on the main foundations by 80%. The cost of the bridge was \$60,000,000.

After 63 years of service, the swing bridge that carried the

World's Longest Spans by Type of Bridge

Type	Bridge	Location	Year Completed	Span
Cable Suspension	Golden Gate	San Francisco	1937	4,200 ft.
Transporter Bridge	†Sky Ride	Chicago	1933	1,850
Cantilever	*Quebec	Canada	1917	1,800
Steel Arch	Kill van Kull	New York	1931	1,652
Eyebar Suspension	*Florianópolis	Brazil	1926	1,114
Concrete Arch	Sando	Sweden	1943	866
Continuous Truss	Dubuque	Mississippi river	1943	845
Simple Truss	*Metropolis	Ohio river	1917	720
Continuous Girder	Düsseldorf-Neuss	Rhine river	1951	676
Vertical Lift	*Cape Cod Canal	Massachusetts	1935	544
Wichert Truss	Homestead	Pittsburgh	1937	533½
Swing Span	*Fort Madison	Mississippi river	1927	525
Tubular Girder	*Britannia	Menai straits	1850	460
Timber Span	*McKenzie River	Coburg, Ore.	1926	380
Prestressed Concrete Girder	Worms	Germany	1953	375
Bascule	*Sault Ste. Marie	Michigan	1914	336
Simple Girder	Harlem river	New York	1951	330
Masonry Arch	Plauen	Saxony	1903	295
Single Leaf Bascule	*16th Street	Chicago	1919	260
Concrete Girder	Villeneuve	Seine river	1939	256

*Railroad bridge.

†Not standing.

New York Central railroad over the Harlem river in New York city was replaced in 1956 by a vertical lift bridge. The new structure is 1,780 ft. between abutments with through type plate girder approaches and two 380-ft. duplicate, parallel, double-track, through type, Warren truss vertical lift spans, with an underclearance of 135 ft. when raised.

An expressway between the Holland tunnel and the New Jersey turnpike was completed in 1956. It includes a \$20,000,000 bridge across Newark bay which carries two 36-ft. roadways. With approaches, the bridge is 9,500 ft. long between abutments. An arch-type channel span is 400 ft. long.

The longest bridge in the world, a 24-mi. low-level structure over Lake Pontchartrain, between Mandeville and New Orleans, La., was completed in 1956. It carries a 28-ft. roadway on 2,235 precast, prestressed, concrete spans 56 ft. long. Each pier consists of two prestressed 54-in. hollow concrete piles, topped by a precast concrete girder. Eleven special spans provide three bascule bridges. The bridge cost \$46,000,000.

The Queensboro bridge over the East river in New York city, one of the most heavily traveled bridges in the world, was provided with two additional traffic lanes to add to the existing seven lanes. Space for the new roadway was provided by the

removal of rapid transit tracks from the upper deck. Originally designed to carry four trolley tracks on the lower deck and four rapid transit tracks on the upper deck, the bridge now would carry only vehicular traffic.

Construction was started late in 1955 on the rebuilding of the International bridge over the Rio Grande at Laredo, Tex., which had been partially destroyed by flood in 1954. The previous structure consisted of two approach spans and five concrete arch spans. The new structure would have prestressed concrete girders and would use the original piers which were unharmed. It would carry a 40-ft. roadway and two 8-ft. sidewalks.

Scheduled for completion late in 1956, the Kingston-Rhinecliff bridge over the Hudson river in New York is of continuous deck type with two 800-ft. main spans, with arched bottom chords. It carries a 36-ft. roadway and two 2-ft. emergency sidewalks.

A two-span, through, steel arch bridge was completed in 1955 over the Missouri river at Leavenworth, Kan. The arch ribs are slender and are stiffened by deep tie-girders that are continuous over the two 420-ft. arch spans. Vierendeel bracing is used between the arch ribs. The approaches consist of continuous deck girder spans with a distance of 2,436 ft. between abutments. The bridge carries a 26-ft. roadway and two 2½-ft. sidewalks. The cost of the bridge was \$2,700,000.

The Pennsylvania and New Jersey turnpikes were connected in 1956 by a bridge over the Delaware river, costing \$16,000,000, between Edgely, Pa., and Florence, N.J. Its 76-ft.-6-in. roadway carries six lanes of traffic. The main crossing is a three-span continuous truss bridge with a tied-arch 682-ft. centre span, flanked by 341-ft. side spans. The over-all length of the bridge is 6,571 ft.

Construction was completed late in 1955 of a \$3,500,000 double-leaf bascule bridge over the Chehalis river at Aberdeen, Wash. Each leaf is 135 ft. long between pivot and midspan, making the bridge one of the longest of its type in the west.

A three-span continuous bridge was completed over the Missouri river at Jefferson City, Mo., late in 1955. The centre span

SIDNEY LANIER BRIDGE, near Brunswick, Ga., completed in June 1956. The mile-long bridge crosses Oglethorpe bay, about 5 mi. west of the Atlantic ocean



is a 640-ft. tied arch with side spans of 416 ft. Continuous deck girder approach spans make up the total length of 3,093 ft. The bridge carries a 28-ft. roadway and two 4-ft.-10-in. sidewalks and cost about \$4,800,000.

The Gateway bridge, of suspension type, across the Mississippi river at Clinton, Ia., was completed in 1956. Its cost was \$6,800,000. The bridge is 9,557 ft. long with a main span of 644 ft. It carries a 26-ft. roadway and two 3-ft. sidewalks.

Bids were taken late in 1955 for the construction of a \$46,000,-000 bridge to parallel the existing Carquinez Straits bridge in California. The bridge would be of cantilever type with two 1,100-ft. main spans, two 500-ft. side spans and a 150-ft. tower span between the two main spans. The new bridge would be a copy of the older bridge in elevation, but would be 60 ft. wide instead of 42 ft.

A cantilever bridge was completed late in 1955 over the Columbia river at Umatilla, Ore. It has two 600-ft. main spans, joined by a 120-ft. tower span, and flanked by two 300-ft. anchor arms. The approaches consist of 15 plate girder spans.

Construction was started in 1955 on a \$6,500,000 bascule bridge across the Duwamish river in Seattle, Wash. The bridge features two buoyant-type main piers to reduce the pressure on the foundations. The two main piers would be connected below channel bottom by two cellular concrete struts to maintain their alignment and spacing even in the event of an earthquake.

A continuous through truss bridge was completed late in 1955 across the St. Lawrence river at Massena, N.Y., to Barnhart Island, at a cost of \$5,000,000. Carrying two lanes of vehicular traffic and one railroad track, the bridge was the first completed permanent structure in the St. Lawrence power project. The centre span is 508 ft., flanked by 283-ft. end spans.

Work was started in 1956 on an \$8,000,000 high-level cantilever bridge over the ship channel at Corpus Christi, Tex. The main span was to be 620 ft. and the anchor arms 312 ft. The approaches would include deck truss spans, welded plate girder spans and prestressed concrete spans. The bridge would carry two 36-ft. roadways, separated by a 4-ft. mall, and two 3-ft. sidewalks. The length between abutments would be 5,818 ft.

Construction was started in 1956 on a three-span plate girder bridge over the Quinnipiac river at New Haven, Conn. Its 387-ft. centre span would make the bridge the longest of its type in the United States. One of the connecting approaches includes a girder span of 379 ft., the second longest in the U.S.

Plans were made in 1956 for an \$18,000,000 floating concrete bridge across Lake Washington, east of Seattle, similar in design to the floating bridge that had been in use since 1940, except for a modification to eliminate curves in the roadway around the draw span. A new crossing over San Francisco bay, consisting of fill, trestle and tube at an estimated cost of \$250,000,000, was studied in 1956 and declared to be feasible.

A new world's record for long-span glued-laminated timber arches was set on a recently completed arena at West Palm Beach, Fla. The arches are three-hinged with a clear span of 242½ ft. and a rise of 74 ft.

Dominican Republic.—A \$5,000,000 suspension bridge was completed in 1956 over the Ozama river in Ciudad Trujillo. It has a main span of 576 ft. and carries a 48-ft. roadway. The approaches are made up of five 102-ft. deck truss spans.

England.—Construction was started in 1956 on a steel arch highway bridge over the Mersey river near Liverpool. The span would be 1,062 ft. and would carry a 33-ft. roadway and one 6-ft. sidewalk. It would be the longest bridge of its type in Great Britain, and would cost \$5,600,000.

Germany.—A novel suspension bridge was planned in 1956 for erection over the Rhine river at Cologne. It was to have a single tower in the river of triangular shape with a series of

straight stays radiating from the apex out to the midpoints of the adjacent 990- and 500-ft. spans, to carry a 75-ft. wide deck.

Gold Coast.—Scheduled for completion late in 1956, an 805-ft. steel arch bridge was being constructed across the Volta river at Adomi. The steel was fabricated in Great Britain and welded into 5-ton arch segments before shipment. The cost would be \$2,000,000.

Italy.—A four-conductor power line was completed across the Straits of Messina late in 1955 with a record-breaking span between towers of 12,000 ft. The towers are 735 ft. high. A concrete arch bridge completed in 1956 over the Arzocco river at Varazze is unique in the use of centring of wood trussed arches with 331-ft. clear span and 98-ft. rise. The chords of the wood arch centring were made up of bundles of planks, bent to shape, and clamped with bolts.

Japan.—The Inoura Narrows bridge, at the mouth of Omura bay, Kyushu Island, a fixed truss arch of 710-ft. clear span, was completed late in 1955. It was the third longest fixed steel arch and the longest fixed steel truss arch in the world and carries a 24-ft. roadway. The trusses are cradled for stability against wind.

New Zealand.—A prestressed concrete bridge, consisting of five 105-ft. spans, was completed over the Hutt estuary near Wellington. The largest bridge of its type in that country, it carries a 30-ft. roadway, a 6-ft. sidewalk and an 11-ft.-6-in. serviceway for water mains.

Portugal.—Construction was scheduled to start in 1956 on a \$3,000,000 bridge over the Douro river between Porto and Gaia. The bridge was to be a single 886-ft. reinforced concrete span which would be the longest of its type in the world.

Sweden.—A self-anchored suspension bridge of unusual design was completed in late 1955 over the Stromsund in central Sweden with a main span of 600 ft. and side spans of 245 ft. to carry a 30-ft. roadway. In place of the usual cable and suspender arrangement, this bridge has inclined stays from the tops of the towers to the stiffening girders. There are four stays in the main span, two from each tower, fastened to the stiffening girder at the fifth points. There are two stays in each side span, fastened to the end and midpoint of the stiffening girder.

A single-leaf bascule, completed in 1956 in Stockholm, has the largest area for a bridge of its type in the world. Its span is 138.5 ft. and width 73 ft. Provisions were made to widen the bridge at a later date to 89 ft.

Venezuela.—A \$45,000,000 bridge and tunnel project was planned in 1956 to cross Lake Maracaibo strait between Maracaibo and Palmarejo to carry a highway and railroad. The tunnel would carry the highway under the ship channel and a lift bridge would carry the railroad over the ship channel. (See also ROADS AND HIGHWAYS.)

(D. B. S.)

British Borneo. Under this heading are grouped the colonies of North Borneo (including Labuan Island) and Sarawak, and the protected sultanate of Brunei. Languages: various indigenous, Chinese, Malay (lingua franca). Religions: Moslem, Buddhist, various pagan, many Chinese Christians.

North Borneo.—Area: 29,388 sq.mi. (including Labuan 35 sq.mi.). Pop.: (1951 census) 334,141, including 243,009 Borneans, 74,374 Chinese; (1954 est.) 367,753. Chief towns (pop. 1951 census): Jesselton (cap.) 11,704; Sandakan (port) 14,499. Governor in 1956, R. E. Turnbull.

Sarawak.—Area: 47,071 sq.mi. Pop.: (1947 census) 546,385; (1954 est.) 605,000, including 213,200 Sea Dayaks (Ibans), 47,500 Land Dayaks, 32,300 other indigenous tribespeople, 167,700 Chinese, 137,700 Malays and Melanaus. Chief towns (pop. 1954 est.): Kuching (cap.) 45,500; Sibuan (river port) 12,000;

Miri (oil fields) 10,600. Governor (and high commissioner for Brunei) in 1956, Sir Anthony Abell.

Brunei.—Area: 2,226 sq.mi. Pop.: (1947 census) 40,657; (1955 est.) 56,000 (Malay 49%, Dayak 3.5%, other indigenous 25.5%, Chinese 19%, other Asian 1.5%, European 1.5%). Chief towns (pop., 1955 est.): Brunei Town (cap.) 11,000, Seria (oil fields) 18,000. Sultan, Omar Ali Saifuddin; British resident in 1956, J. O. Gilbert.

History.—Rubber production continued at a high level in the first half of 1956 despite the decline in rubber prices, but there was a marked drop in the exports from Sarawak. Contrary to expectation, production of petroleum from the Seria field of Brunei was maintained at the level of 1955. The British Malayan Petroleum company commenced offshore drillings in both Brunei and Sarawak. Three of the drilling platforms in Brunei were 25 mi. out to sea; the Sarawak drilling, about 60 mi. S.W. of Brunei, was about 8 mi. offshore. In North Borneo new government offices and a hospital building were completed in Jesselton, and a new workmen's compensation ordinance came into force.

(D. W. F.)

Education.—(1955) Schools: *North Borneo*: primary 228, pupils 24,771; secondary 4 (and 20 schools with secondary forms), pupils 2,070; 1 vocational and 1 teachers' training school. *Brunei*: primary Malay vernacular 44, pupils 8,300, teachers 300; Chinese 8, pupils 1,727; mission 3; secondary, pupils 332, teachers 26; teachers' training, pupils 96. *Sarawak*: primary 567, pupils 47,543; secondary 34, pupils 5,245 (37,277 of total enrolment were Chinese).

Finance and Trade.—Monetary unit: Malayan dollar, M\$3.1=U.S.\$1.

Budget	Revenue	Expenditure
North Borneo (1954 actual)	M\$ 23,796,347	M\$ 26,892,589
Brunei (1955)	M\$102,669,000	M\$ 28,934,000
Sarawak (1955)	M\$ 49,774,861	M\$ 34,431,606

Foreign trade	Imports	Exports
North Borneo (1955)	£10,220,000	£12,240,000
Brunei (1955)	£12,210,000	£35,400,000
Sarawak (1955)	£51,600,000	£55,700,000

Principal exports (1954; 1953 in parentheses): *North Borneo*: rubber 16,800 tons (17,100 tons), copra 26,600 tons (12,700 tons), tobacco 311,300 (142,900) lb., timber 10,500 (5,200) cu.ft. *Sarawak*: crude oil, refined oil, pepper 15,465 tons, rubber 23,188 tons, timber 197,376 tons. *Brunei*: crude oil (production) 38,750,000 bbl., natural gas, plantation gas. Principal imports: machinery, textiles, tobacco, cereals.

British Columbia. The third largest and the most westerly of Canada's ten provinces, British Columbia has an area of 366,255 sq.mi. of which 6,976 sq.mi. is water. It is bounded on the west by the Pacific ocean and the Alaskan panhandle; east by the province of Alberta; south by the 49th parallel and the states of Washington, Idaho and part of Montana; and north by the 60th parallel and Alaska, Yukon Territory and part of the Northwest Territories.

The population on June 1, 1956, was estimated to be 1,350,000 (1951 census 1,165,210). The 1951 census indicated there were 93,471 urban dwellers and 371,739 rural dwellers, and that 66% of the population was of British extraction. The chief cities and their 1955 estimated populations were: Vancouver, 398,227; Victoria, the capital, 53,000; and New Westminster, 36,000. The metropolitan population of Vancouver and Victoria were estimated to be 644,000 and 123,000, respectively.

History.—In the fourth session of the 24th parliament of British Columbia, Jan. 17 to March 2, 1956, the following measures were among those passed: an act to provide for two weeks' annual holidays for workers; an act to aid areas distressed through loss of crops or livestock as a result of drought, flood or frost; an act to prevent discrimination in regard to employment and in regard to membership in trade unions by reason of race, religion, colour, nationality, ancestry or place of origin; an act respecting the milk industry, so that producers would receive adequate returns and consumers be ensured continuity of safe, clean fluid milk; an act to control the pollution of waters of the province.



INDIAN CHILDREN of British Columbia meeting Gov. Gen. Vincent Massey of Canada during the latter's tour of the provinces in 1956

In January the Social Credit government announced as its program a major expansion of the agricultural department, new labour legislation, large highway developments, new mental health facilities, a cut in amusement taxes, extension of the Pacific Great Eastern railway to the Peace river and the establishment of a "capital improvement district commission" to develop the capital and surrounding districts.

On June 10 the last spike was driven home marking the completion of the Pacific Great Eastern railway's Squamish-North Vancouver extension. Also in June, the Westcoast Transmission company's gas pipeline started pushing southward to link Vancouver with the vast gas resources of the Peace river area. In September the P.G.E. railway commenced passenger and freight operations from North Vancouver to Prince George.

On Sept. 19, 1956, a provincial election was held with the following party standings, with previous standings in parenthesis: Social Credit 39 (28); Co-operative Commonwealth federation 10 (14); Liberal 2 (4); Labour 1 (1); Independent 0 (1). (The number of legislative seats now totals 52; at the time of the previous election, June 9, 1953, there were 48 legislative seats.)

Members of the provincial executive council or cabinet and their portfolios at Oct. 1, 1956, were: W. A. C. Bennett, premier, finance and president of council; W. D. Black, provincial secretary and municipal affairs; R. W. Bonner, attorney general; W. K. Kiernan, mines; W. N. Chant, public works; P. A. Gagliardi, highways; W. R. T. Chetwynd, agriculture and fisheries; L. Wicks, labour and railways; E. C. F. Martin, health and welfare; R. G. Williston, lands and forests; L. R. Peterson, education; E. C. Westwood, trade and industry.

Education.—During the school year ending June 30, 1955, 223,840 students were enrolled in the schools of the province: elementary, elementary-senior-junior high (154,016); superior (2,450); junior, junior-senior and senior high (67,374). Teaching staffs comprised 8,185 teachers as follows: in the elementary, elementary-senior-junior high, 5,105; superior, 101; junior, junior-senior and senior high, 2,915; and 64 unclassified. Higher education is provided by the University of British Columbia, Vancouver, a provincially endowed institution, with an affiliated junior college, Victoria college, located in Victoria. There are two teacher-training schools located at Victoria and Vancouver and a vocational institute at Vancouver.

The total net cost for the enrolment of 223,840 in 1954-55 was \$80,823,264. The deputy minister and superintendent of education was H. L. Campbell.

Communications.—The total highway mileage as of March 31, 1955, excluding the Alaska highway, was 22,847 mi., of which 12,093 mi. were surfaced, 9,204 mi. were improved earth and 1,550 mi. unimproved earth.

Railway mileage as of Dec. 31, 1955, was 4,495 mi. of main-line track and 1,259 mi. of sidings. During 1955 approximately 8,423,651 tons of cargo were loaded at British Columbia ports on vessels destined to foreign countries, while 1,885,991 tons of cargo received from foreign countries were unloaded at local ports. In 1954 the total number of telephones was 374,275, including 194,110 on automatic switchboards. During 1955 there were 298,396 passenger cars and 100,259 commercial vehicles registered in the province.

Finance.—On Feb. 1, 1956, W. A. C. Bennett, minister of finance, an-

nounced that revenue collected for the fiscal year ended March 31, 1955, was \$198,990,000; expenditures were \$183,437,000; the net debt at Dec. 31, 1955, was \$125,937,817, a decrease of \$13,432,325 from the preceding year. Anticipated revenues were \$224,537,019 and expenditures \$258,427,024, including capital out of income for the fiscal year ending March 31, 1957.

Table I.—*Economic Activity in British Columbia*

	Unit	1954	1955	1956 Preliminary Estimates
Agriculture				
Total value of production	\$	129,177,288	132,000,000	139,000,000
Livestock	\$	17,104,000		
Poultry products	\$	26,070,000		
Dairy products	\$	30,537,000		
Fruits and vegetables	\$	19,821,735		
Field crops	\$	29,794,000		
Miscellaneous	\$	5,850,553		
Fisheries				
Total value of products	\$	69,422,000	60,000,000	63,000,000
Pack of canned salmon	cases	1,743,406	1,406,230	1,200,000
Forestry				
Total value of production	\$	528,022,783	631,699,562	660,000,000
Timber scaled	M.B.M.	5,567,423	6,109,202	
Paper production	tons	647,117	688,873	
Mining				
Total value of production	\$	153,377,315	174,710,606	175,000,000
Lead	\$	45,482,505	45,161,245	
Zinc	\$	34,805,755	52,048,909	
Gold	\$	9,042,246	8,587,920	
Coal	\$	9,154,544	8,986,501	
Internal Trade				
Sales of life insurance	\$000	198,360	234,122	280,000,000
Total value of retail trade	\$000	1,249,000	1,379,000	1,500,000
Value of retail department store sales	\$000	173,960	189,302	210,000
Railway freight loaded	tons	11,250,000	14,194,840	14,900,000
Consumption of electric power	000 kw.hr.	5,209,683	5,895,295	6,480,000
Construction building permits	\$000	164,840	227,763	275,000
Bank debits	\$000	11,956,325	12,812,854	15,000,000
Index of employment	1949=100	106.2	110.0	115.0
Personal income	\$000	1,856,000	1,938,000	2,150,000

Agriculture, Fisheries, Mining, Forestry.—Preliminary provincial departmental estimates indicated that the primary industries in 1956, with the possible exception of agriculture, showed moderate increases in value over the figures for 1955. Exports and imports through British Columbia customs ports continued to show increases over the previous highs established during 1955. Several pulp and paper companies commenced operations during 1956, and more plants were under way or under consideration. Prices tended to increase moderately, but wages and employment also increased, and in fact labour shortages were apparent in most of the skilled trades.

Table II.—*Principal Manufacturing Industries of British Columbia*

Industry	Selling value of factory shipments	
	1953	1954
Sawmills	\$ 323,474,522	\$ 347,883,651
Pulp and paper	138,883,093	157,781,577
Petroleum products	40,562,462	81,547,626
Fish processing	65,726,800	71,068,695
Veneers and plywoods	56,503,885	56,082,562
Slaughtering and meat packing	53,415,699	54,254,450
Sash, door and planing mills	47,658,772	54,164,602
Miscellaneous food preparations	40,172,603	43,857,827
Shipbuilding	32,548,906	34,040,210
Fertilizers	35,156,537	31,108,896
Total, all manufacturing industries	\$1,366,823,690	\$1,474,156,242

Manufacturing.—The high light of British Columbia's growing economy during 1956 continued to be the expansion of secondary industries both in number and location. The northern areas of the province showed exceptional growth, and the discovery of gas and oil coupled with the completion of the P.G.E. railway from Prince George to North Vancouver assisted in this growth. The Aluminum Company of Canada at Kitimat was expanding its facilities, increasing its developed horsepower from 450,000 to 750,000. (G. T. H.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Pacific Canada* (1943).

British Commonwealth: see COMMONWEALTH OF NATIONS.

British East Africa. This term is used to include Kenya, colony and protectorate; Somaliland protectorate; Tanganyika, trust territory; Uganda, protectorate; and Zanzibar, protected island sultanate.

The East Africa high commission, comprising the governors of Kenya, Tanganyika and Uganda, administers taxation, development and research, transport and other central services in these territories, and has power to legislate, with the advice and consent of the East African central legislative assembly. Governors in 1956: Kenya, Sir Evelyn Baring; Somaliland, T. O. Pike;

Tanganyika, Sir Edward Twining; Uganda, Sir Andrew Cohen. Buganda (protected African kingdom within Uganda): kabaka (king), Mutesa II; British resident, C. A. L. Richards. Zanzibar: sultan, Sir Khalifa bin Harub; British resident, H. S. Potter. East Africa high commission: chairman, Sir Evelyn Baring; administrator, A. M. Bruce Hutt.

Territory	Area (sq.mi.)	Pop. (1955 est.)	Chief towns (with pop., latest est.)
Kenya	223,478	6,048,000	Nairobi (cap., 118,976*) Mombasa (port, 84,746*)
Somaliland	67,997	640,000	Hargeisa (cap., c. 20,000 hot season—40,000 cold season) Berbera (port, 9,080†)
Tanganyika	362,688	8,324,000	Dar es Salaam (cap., 99,140†) Tanga (22,136†)
Uganda	93,981	5,508,000	Entebbe (cap., 7,942†) Kampala (Buganda cap., 22,094*)
Zanzibar	1,020	278,000	Zanzibar (cap., 45,275*)

*1948 census. †1951 est. ‡1952 census.

History.—*Kenya.*—Conditions improved greatly during 1956. Statements made in Nairobi in January indicated that the government considered that movements among Kikuyu, Embu and Meru tribesmen to secure Mau Mau aims by methods of passive resistance modelled on the Indian passive resistance campaign had been brought under control. The aims of the movements had been to obtain more land for the Kikuyu, self-government for the three tribes and the expulsion of Europeans. On April 10 "General" Tanganyika, third in rank in the Mau Mau organization, was recaptured and subsequently tried on a charge of murder. On Oct. 21 Dedan Kimathi, over-all leader of the militant Mau Mau since the early days of the emergency, was also captured. The British secretary of state for the colonies, A. T. Lennox-Boyd, had been able to announce in parliament early in June that the effective strength of the Mau Mau was reduced to about 1,000.

The 1955–56 coffee crop reached the record figure of 23,500 tons, worth more than £11,000,000. The tea industry also had a record year in 1955, producing 19,000,000 lb. Kenya exports in the first three months of 1956 showed an increase of almost 50% over the same period of 1955 and totalled in value £10,487,520. In February the government floated a loan of £4,250,000 for the development of agriculture, education, road communications, water supplies and airfields, but failed to attract investors. In the same month, however, E. A. Vasey, Kenya's minister for finance, was able to announce that, subject to the approval of parliament, the British government was prepared to make available up to £6,000,000 in the financial year 1956–57, consisting of a grant of £4,000,000 and an interest-free loan of £2,000,000. He added that the £10,000,000 grant made in 1955–56 was proving adequate for the needs of the current financial year and it was unnecessary to draw upon the additional £4,000,000 interest-free loan offered by the United Kingdom. By September, however, the financial situation appeared less satisfactory and Vasey stated that many developments regarded as essential or desirable might have to be postponed or restricted.

In January the Coutts report on the method of electing African members of the Kenya legislative council was tabled in the council along with proposals published by the Kenya government. It was stated by W. F. Coutts himself (who after preparing the report became minister of education, labour and lands) that the universal complaint of the witnesses he had heard had been of the inadequacy of African representation rather than of the manner of election. The proposals included direct voting by secret ballot in all African elections, minimum age qualifications of 21 for voters and 25 for candidates together with qualifications of education or public service or experience or character. In addition, candidates would be required to have further minimum educational and salary or other qualifications. Any Kikuyu, Embu or Meru wishing to vote would be required to satisfy his district



VEILED AFRICAN WOMEN watching Princess Margaret Rose of Great Britain in a procession through the streets of Mombasa, Kenya, during her tour of the East African colonies in 1956

commissioner that he had given active support to the crown during the emergency. Members of the three tribes would neither be permitted to stand for election outside Central province or Nairobi nor to vote for candidates outside those areas. African members of the legislative council welcomed the recommendations in general but disliked the proposed multiple voting. In April the European Elected Members association submitted to the governor proposals for changes in the Kenya constitution while three months later, in July, the African unofficial members of the legislative council condemned the spate of constitutional proposals that had been published. Shortly afterward six Asian elected members claimed that negotiations to bring about constitutional changes were frustrated because the European elected members insisted on the maintenance of parity with non-European representation even if the African membership of the council was increased. The election of European and Asian members of the legislative council took place in September and October. In the latter month the 14 European elected members agreed to discard all group or party affiliations. Almost simultaneously the secretary of state for the colonies announced that he had agreed to modifications in the constitution proposed by unofficial members of all races in the legislative council. As soon as the constitution had been amended two more African representatives would be appointed, together with two nominees suggested by the board of agriculture and the board of commerce and industry. The membership of the council of ministers also would be increased by one European and one African and the government agreed that extra seats should be created in the legislative council to correct the disparity between government and nongovernment representation and to allow ministers the opportunity to represent a wider section of the community than one constituency.

Under the heading of capital expenditure the most important theme to be undertaken was the laying down of new railway

marshalling yards and the provision of a new industrial area in Mombasa. Preliminary work on Kenya's long-term hydroelectric scheme at Seven Forks on the Tana river also proved satisfactory. Another great scheme began to bear fruit when the first courses for full-time students of the Royal Technical college began in April. The Gandhi Memorial academy, incorporated in the college, was opened by the vice-president of India, S. Radhakrishnan, in July and the college itself was officially opened by Princess Margaret during her visit to Kenya in October. The duke of Edinburgh also visited the colony in October. In April Indians and Moslems alike expressed disapproval of the government's statement that Britain would be regarded as the primary source of new immigrants.

Tanganyika.—The year began badly with floods from the Ruvuma river causing loss of life and considerable damage. Constitutional issues were prominent. In January the Tanganyika National society published its program in which it called for common citizenship, a single system of voting based upon mutually agreed qualifications, the abolition of racial discrimination and ultimate self-government for Tanganyika within the British commonwealth. Shortly afterward members of the legislative council representing all three races founded the United Tanganyika party with, again, full self-government within the commonwealth as an ultimate objective and an antifederation policy, with "Tanganyika for the Tanganyikans" as its slogan. The party also denounced racial discrimination. In March V. K. Krishna Menon, chief Indian delegate to the United Nations, stated in the Trusteeship council that progress in Tanganyika had stagnated during the past 20 years. Britain replied that the rate of advance was not entirely at the will of the administration. In spite of strenuous British objections against imposing too rigid a pattern the council approved a report calling upon Britain to lay down intermediate target dates toward political independence for Tanganyika. On April 25 the governor, Sir Edward Twining, announced that elections on a common roll to the legis-

lative council would take place in some constituencies in 1958, and in May he appointed a committee to study the government's detailed proposals for putting this plan into effect. The committee's proposals, submitted in July, included residential qualifications for voters and candidates and, in addition, alternative qualifications of education, public office, income and property. The year was also memorable for a visit in October by Princess Margaret.

Uganda.—The question of direct elections occupied attention in Uganda throughout the year. In January a motion calling for direct elections to the legislative council in 1957 was introduced by a Uganda National Congress member but was defeated by 45 votes to 9. Almost simultaneously the Buganda government, acting under the terms of the 1955 agreement, appointed a committee to consider methods of introducing direct elections to the legislative council from Buganda in 1957. On April 24 the governor, Sir Andrew Cohen, announced that direct elections on a common roll would be introduced for the whole protectorate in 1961 irrespective of Buganda's decision regarding 1957. The year 1961 was not, however, a target date for self-government. Earlier in the month the Congress party had organized a "self-government week." In June, however, the Buganda *lukiko* (council) rejected a motion for direct elections to the *lukiko*. Discussions between the Toro *rukurato* (council) and the protectorate government regarding new constitutional arrangements for Toro broke down when the Toro representatives rejected the District Councils ordinance as a basis for the proposed changes. Later discussions between the governments of Buganda and Bunyoro concerning the future of the so-called "lost counties," formerly part of Bunyoro but for more than 60 years included in Buganda, also proved fruitless. In May the executive council met for the first time in Mbale in the hope of widening public interest in the council's work.

The legislative council, meanwhile, resolved itself into a committee of supply for the first time when considering the annual estimates for 1956-57.

The western extension of the railway to Kasese was completed in March and the service began on Aug. 1. The line was officially opened on Nov. 23. In July a £6,000,000 loan floated by the Uganda Electricity board was fully subscribed within a short time and in October the board sought expert advice on the likely demand for electricity in the period 1956-70.

Zanzibar.—In January W. F. Coutts submitted his report on the method of choosing the 12 proposed unofficial members of the legislative council. Six were to be elected and six seats were to be allocated to racial groups. As a result of the influence of the Aga Khan, the Arab members agreed to sit in the legislative council once more although they had boycotted Coutts' inquiry. In August the council with its full Arab complement accepted the Coutts report. In September provisional plans were announced for the creation of a privy council, the inclusion of unofficial members in the executive council and the enlargement of the legislative council.

(K. I.)

Education.—*Kenya* (1955). Primary schools: European 43, pupils 6,762, teachers 310; others (Arab, Asian and African schools) 3,808, pupils 425,925, teachers 9,835. Secondary: European 11, pupils 2,283, teachers 168; others 41, pupils 8,707, teachers 597. Vocational schools 8, pupils 1,312, teachers 172.

Somaliland Protectorate (1954). Primary: grant-aided private Koranic schools 45, pupils 1,549; government schools 16. Secondary: pupils 60. Vocational centre 1, trainees 40.

Tanganyika (1954). Primary: European 29, pupils 1,845; African, pupils 275,628 (middle schools, pupils 25,480); Indian 98, pupils 13,618. Secondary: European 2, pupils 200; Indian 36, pupils 4,511; African, pupils 2,956. Teacher-training centres 2,049 students. Agriculture and trade schools: 600 students. Higher education provided by the university college of Makerere, Uganda, 113 Tanganyika students.

Uganda (1955). Primary: grant-aided 1,890, pupils 258,830, teachers 8,823; unaided 2,251, teachers 2,527. Secondary: grant-aided 136, pupils 12,210, teachers 703; unaided 39, teachers 113. Vocational: grant-aided 47, pupils 3,049, teachers 590; unaided 31.

Zanzibar (1955). Primary 67, pupils 13,428, teachers 438; secondary

4, pupils 627, teachers 41. Teacher-training 122.

Finance and Trade.—Monetary unit: East African shilling, divided into 100 cents, valued at parity with the shilling sterling and at 14 cents U.S.

	Revenue (1955-56 est.)	Expenditure (1955-56 est.)	Imports (1955)	Exports (1955)
Kenya	£35,337,000	£38,726,000	£71,500,000	£28,000,000
Somaliland Prot.	1,395,000	1,395,000	2,880,000	1,373,000
Tanganyika	19,468,000	19,669,000	43,500,000	37,400,000
Uganda	16,383,000	19,149,000	34,000,000	42,300,000
Zanzibar	2,606,000	2,358,000	6,702,661	6,781,695

Note circulation: (June 1954) £41,831,000; (June 1955) £49,082,000. Principal exports (1955): *Kenya*, coffee, sisal, hides and skins, wattlebark extract, sodium carbonate, pyrethrum. *Somaliland Prot.*, hides, skins, gums livestock. *Tanganyika*, sisal, coffee, cotton, diamonds, hides, gold. *Uganda*, coffee £20,134,103, cotton £16,386,472, hides and skins, tea. *Zanzibar*, cloves and clove oils, coconut oil, copra.

British Guiana. This British colony in northeast South America lies between Venezuela (west), Brazil (southwest and south) and Surinam (east). Area: 82,997 sq.mi. Pop.: (1946 census) 375,701; (1955 est.) 485,000, including 221,000 East Indians, 170,000 Negroes, 52,500 mixed, 19,000 Amerindians, 13,100 Europeans (two-thirds Portuguese). Language: English; various East Indian. Religion (1946 census): Christian 60%; Hindu 30%; Moslem 8%. Principal towns (pop. 1954 est.): Georgetown (cap.) 92,098, New Amsterdam 12,826. Governor in 1956, Sir Patrick Renison.

History.—The constitution that had been suspended in 1953 was partially restored in 1956. The terms announced in April were later modified in response to representations made by a conference of all the colony's political parties, and then provided for a legislative council of 28 members, and for an executive council with the governor as president. It was planned that elections should take place in the spring of 1957. A special revision order was passed in February to provide for the bringing and keeping up to date of the electoral register. A revised edition of the colony's laws came into force on Jan. 15. The arrival of a senior administrative officer marked the start of practical work on the reform of local government.

The British Guiana Trades Union council was admitted to membership of the International Confederation of Free Trade Unions. A long-standing wage dispute in the sugar industry went to arbitration and the workers were awarded a 10% increase in their cost of living supplement. At Plantation Wales, West Bank Demerara, a start was made on a scheme for leasing 10-ac. plots of cane land to approved tenants, the estate management to perform certain agreed services and to buy cane for processing at agreed rates. A B.W.I. \$2,000,000 (British West Indian dollars) rice mill was opened by the government at Anna Regina, Essequibo coast. A regional rice agreement gave British Guiana preferential rights as supplier of rice to the British Caribbean colonies, excepting British Honduras (*see* BRITISH WEST INDIES).

Ordinary revenue for the year was estimated at B.W.I. \$40,113,775 and expenditure at B.W.I. \$39,954,071. The separate development budget was balanced at B.W.I. \$26,711,648, including Colonial Development and Welfare aid worth B.W.I. \$9,925,799. A loan of £3,540,000 (B.W.I. \$16,992,090) was floated in April, £3,000,000 being offered in London and the rest subscribed from local government funds. Later a local loan of B.W.I. \$1,750,000 was raised for rehabilitation of the telecommunications system. The development program for 1956-60, published during the year, called for expenditure of B.W.I. \$57,000,000 for economic and B.W.I. \$34,000,000 for social development. (R. H. Y.)

Education.—(1955) Government and aided schools: primary 301, pupils 95,258, teachers 2,424; secondary 4, pupils 1,511 (excluding private schools with about 6,000 pupils), teachers 82; vocational 3, pupils 1,347, teachers 25; 1 teachers' training college, students 57; higher education, 322 students.

Finance and Trade.—Monetary unit: British West Indian dollar, B.W.I. \$1.7=U.S. \$1. Budget (1955 actual in British West Indian dollars): revenue \$42,496,467; expenditure \$40,194,706. Foreign trade (1955, in B.W.I. dollars): imports \$94,517,619; exports \$89,004,202. Principal exports:

sugar, bauxite, rice, rum, diamonds, timber, molasses. Production (metric tons, 1955): sugar 250,000; bauxite 2,435,282.

ENCYCLOPÆDIA BRITANNICA FILMS.—*Caribbean* (1955).

British Honduras. This British colony in Central America is bounded by Mexico (north and west), Guatemala (west and south) and the Gulf of Honduras and Caribbean sea (east). Area: 8,867 sq.mi. Pop.: (1946 census) 59,220, including 22,693 Creoles and 10,030 Indians (Maya); (Dec. 1954 est.) 78,094. Languages: English, Spanish, Indian dialects. Religion: mainly Roman Catholic. Chief towns (pop., 1953 est.): Belize (cap.) 27,500; Stann Creek 3,500. Governor in 1956, C. H. Thornley.

History.—Following the devastation of the northern districts by Hurricane "Janet" in Sept. 1955, the colonial office approved a relief and reconstruction program costing £900,000, of which £500,000 was in the form of a free grant. At the Caribbean federation conference, held in London in Feb. 1956, the observer from British Honduras expressed the wish to "leave the door open to federation," although British Honduras was not at that time prepared to join in any political federation with the West Indies. In the political field, the People's United party, which had a majority in the government, suffered a split among its leaders and a new party was formed called the Honduran Independence party. Preparations began for the 1957 elections, the second election to be held with universal adult suffrage. In May a ten-man agricultural team visited the country for 20 days with a view to advising and recommending on the possibilities for agricultural and fisheries development and to draw up plans for such development, including the processing of primary products. Toward the end of the year the official radio station of Guatemala, after a silence of more than one year, resumed its anti-British broadcasts beamed at British Honduras. (A. L. A.)

Education.—Schools (1954): grant-aided primary 95 (including 60 controlled by Jesuit missions), pupils 13,716; independent primary 27, pupils 3,350; secondary 9, pupils 1,192; 1 technical high school, pupils 92; teachers' training college opened June 1954.

Finance and Trade.—Monetary unit: British Honduras dollar, B.H. \$1.42 = U.S. \$1. Budget (1955 est.): revenue (including grants) £1,215,000; expenditure £1,243,000. Foreign trade (1955): imports £3,580,000; exports £2,050,000. Principal exports: timber, chicle, citrus fruits and juice, copra.

ENCYCLOPÆDIA BRITANNICA FILMS.—*Caribbean* (1955).

British Malaya: see MALAYA, FEDERATION OF; SINGAPORE.

British Somaliland: see BRITISH EAST AFRICA.

British South African Territories. Basutoland (colony), an enclave within southeastern Union of South Africa; Bechuanaland protectorate, north of the Union; and Swaziland (protectorate), between Transvaal and Mozambique, are generally referred to as the High Commission Territories in South Africa.

	Area (sq.mi.)	Population (1946 census)	Population (1955 est.)	Capital (with est. pop.)
Basutoland	11,716	563,854	590,000	Maseru (4,000)
Bechuanaland Prot.	274,517	296,310	296,000	*
Swaziland	6,704	185,215	217,000	Mbabane (1,600)

*Administrative headquarters are at Mafeking, Cape Province, Union of South Africa.

Population is Basuto, Bechuana, Swazi: in Bechuanaland the most important tribe is Bamangwato (100,987 at 1946 census), with its capital at Serowe (15,935). Europeans (1946): Basutoland 1,689; Bechuanaland 2,379; Swaziland 3,201. Religion: Christian (Basutoland [1946] 345,986); various indigenous. High commissioner in 1956: Sir Percivale Liesching. Resident commissioners: (Basutoland) A. G. Chaplin; (Bechuanaland) J. O. Wray; (Swaziland) B. A. Marwick.

History.—*Basutoland.*—The paramount chief and the Basuto national congress objected to the appointment of A. G.

Chaplin as resident commissioner on the ground that, although an experienced member of the colonial service, he was a white South African in origin. The tribal authorities stated they would decline to co-operate with him in native administration, but his appointment was confirmed.

The possibilities of exploiting the water resources of the colony were discussed in an engineering report. It outlined three practical schemes to harness the silt-free waters of the Orange river high up in the Drakensberg mountains. Sufficient hydro-electric power could be generated not only to supply all Basutoland's needs but also to provide the neighbouring Orange Free State goldfields with more electricity.

Bechuanaland.—In September Seretse Khama, exiled chief of the Bamangwato tribe was granted permission to return from Great Britain to Bechuanaland as a private citizen.

Swaziland.—Improved communications were planned as a result of a report by Sir Arthur Griffin. Large expenditure on roads was contemplated and the building of a railway line to serve the territory was again under discussion. (J. U. L.)

Education.—(1955) *Basutoland* (African): primary 936, pupils 102,605, teachers 2,013; secondary 12, pupils 1,175, teachers 56; technical and vocational 8, pupils 371, teachers 34; teacher training 6, students 319, teachers (including postsecondary) 68. (European): primary 7, pupils 153, teachers 10. *Bechuanaland* (African, European and Eurafican): primary 160, pupils 21,773, teachers 616; secondary 4, pupils 302, teachers 15; vocational 1, pupils 22, teachers 2; teacher training 1, students 55. *Swaziland* (African, European and Eurafican): primary 245, pupils 21,407, teachers 395; secondary 9, pupils 687, teachers 56; 1 trade school, pupils 53; teacher training 2, students 75.

Finance and Trade.—Monetary unit: South African pound (£[S.A.]1 = £1 sterling = U.S. \$2.80).

	Budget (1954–55)		Foreign trade	
	Revenue	Expenditure	Imports	Exports
Basutoland	£1,389,828	£1,451,021	(1954) £2,612,007	£1,930,486
Bechuanaland	£1,054,671*	£1,078,735*	(1955) £2,462,495	£2,821,647
Swaziland	£1,052,579*	£1,024,293*	(1954) £2,386,332	£3,134,462

*Including development and welfare grants.

Principal exports: *Basutoland*, sorghum, hides and skins, wool, mohair, livestock. *Bechuanaland*, livestock, dairy produce, hides and skins, gold. *Swaziland*, asbestos, livestock, hides and skins, wattle bark extracts, tobacco, rice, tin.

British West Africa: see GAMBIA; GOLD COAST; NIGERIA; SIERRA LEONE; TRUST TERRITORIES.

British West Indies. Under this heading are treated matters of common concern to Jamaica, the four Leeward Island colonies (Antigua, St. Kitts-Nevis-Anguilla, Montserrat and the British Virgin Islands), the four Windward Island colonies (Grenada, St. Vincent, St. Lucia and Dominica), Trinidad and Tobago, Barbados, and the mainland colonies of British Guiana and British Honduras. Total area: 99,961 sq.mi. Population (1954 and 1955 est.) 3,487,345. (See also articles on the individual colonies.)

History.—A conference held in London in February under the chairmanship of the secretary of state for the colonies was attended by plenipotentiaries from all the colonies that had agreed to join the British Caribbean federation and by observers from British Guiana and British Honduras. The federal plan of 1953 was finally accepted subject to some minor variations; the way was left open for the subsequent accession of British Guiana and British Honduras. The representatives of the West Indian governments at the conference were constituted a standing federation committee. A federal secretary, chief justice, attorney general, finance officer, establishment officer and information officer were appointed to a provisional federal government with temporary headquarters in Barbados. The British Caribbean Federation act, providing for a federal constitution to be embodied in an order in council, received the royal assent on Aug. 2, which date was celebrated as a public holiday in the British West Indies. A Caribbean Federal Labour party was inaugurated at a meeting in St. Lucia in September with N. W. Manley (Ja-

maica) being named president and G. H. Adams (Barbados) and R. L. Bradshaw (St. Kitts) vice-presidents.

Colonial development and welfare aid to the West Indies in the year ended March 31, 1956, totalled £4,586,257. The price of sugar under the commonwealth sugar agreement was £40 15s. a ton. West Indian producers were represented on a U.K. delegation to a United Nations conference to review the international sugar agreement. An agreement running from Oct. 1, 1956 to Sept. 30, 1959, named British Guiana as the sole exporter of rice to the region, with a view to supplying the other British Caribbean territories (except British Honduras) with their total rice requirements. British Guiana undertook not to sell rice elsewhere before surpluses had been offered to Caribbean consumers, who in turn might import from elsewhere only if British Guiana could not meet their requirements.

Hurricane "Betsy" caused damage and some deaths in Dominica, the Leeward Islands, Puerto Rico and the Bahamas.

(R. H. Y.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Caribbean* (1955); *Caribbean Sky Cruise* (1955).

Broadcasting: see RADIO AND TELEVISION.

Brookings Institution: see SOCIETIES AND ASSOCIATIONS, U.S.

Brownell, Herbert, Jr. (1904–), U.S. government official, was born on Feb. 20 at Peru, Neb. He received his bachelor's degree at the University of Nebraska, Lincoln, in 1924 and his law degree at Yale university in 1927. He practised law in New York city and in 1932 was elected as a Republican to the New York state assembly, where he served two terms. In 1942 he was campaign manager for Thomas E. Dewey in the latter's successful bid for the governorship of New York. Brownell also managed Dewey's campaigns for the Republican presidential nomination in 1944 and 1948 and was chairman of the Republican national committee from 1944 to 1946. He was an early supporter of Dwight D. Eisenhower and chief strategist in the latter's campaign for the presidential election in 1952. Eisenhower on Nov. 21, 1952, named Brownell attorney general in his cabinet, and he took office on Jan. 21, 1953.

Brownell announced on July 4, 1956, that the department of justice was preparing an antitrust suit against General Motors corporation for alleged monopolistic practices in the sale of buses. On July 15 Brownell reported that the government had 99 antitrust suits in the federal courts or pending.

Broz, Josip (Tito): see TITO (JOSIP BROZ).

Brucker, Wilber Marion (1894–), U.S. secretary of the army, was born on June 23 at Saginaw, Mich., and received his law degree from the University of Michigan, Ann Arbor, in 1916. He served with the U.S. national guard in the Mexican expedition of 1916 and was an infantry officer with the American expeditionary forces in World War I, receiving the silver star.

After World War I he was admitted to the Michigan state bar (1919) and practised in his native city of Saginaw. From 1923 to 1927 he was prosecuting attorney for Saginaw county and from 1927 to 1928 assistant attorney general of Michigan; in 1928 he became attorney general of the state, serving until 1930. A Republican, he was elected governor of Michigan in 1930 for the term 1931–33 but was defeated for re-election in 1932.

On April 6, 1954, Brucker was nominated general counsel of the federal department of defense, and his appointment was confirmed April 19. When Robert T. Stevens resigned as secretary of the army, Pres. Dwight D. Eisenhower on June 22, 1955, nominated Brucker to succeed him in that office.

Brucker announced on March 23, 1956, that the army had developed a "master missile" which could detect enemy aircraft and missiles and at the same time co-ordinate the fire of all U.S. anti-aircraft missiles in the area of enemy attack.

Brunei: see BRITISH BORNEO.

Buddhism: see RELIGION.

Budget, National. **United States.**—In a report dated Aug. 28, 1956, the bureau of the budget reviewed the budget of the United States for the fiscal year ending June 30, 1957. The report presented revisions of the original fiscal 1957 estimates contained in the Jan. 1956 budget document, together with actual expenditures and receipts data (instead of estimates) for the fiscal year 1956. The revised budget estimates for 1957 took into account congressional action and other developments which had occurred since January.

Budget receipts for fiscal year 1957 were expected to reach the record total of \$69,800,000,000, as compared with \$68,100,000,000 in the previous year. (See Table I.) Individual income taxes were scheduled to show the largest increase, "reflecting the record high level of the nation's personal incomes." Budget expenditures in fiscal 1957 were estimated at \$69,100,000,000—an increase of \$2,700,000,000 over 1956.

The midyear budget review thus anticipated a surplus of \$700,000,000 in the fiscal year 1957, and reported a surplus of \$1,800,000,000 for fiscal 1956. These successive balanced budgets followed deficits in the four-year period 1952–55; a budget surplus of \$3,500,000,000 had been realized in fiscal 1951.

The surplus of \$700,000,000 for fiscal 1957 was not very different from the estimate of \$400,000,000 which had been presented in the January budget document. However, there were upward revisions of \$4,300,000,000 in budget receipts (attributed to "increased business activity and higher personal incomes") and \$4,000,000,000 in budget expenditures (more than half of which occurred in Commodity Credit corporation farm expenditures—an unusually difficult item to estimate).

Table I.—Summary of Budget Receipts and Expenditures, United States
Fiscal Years 1955, 1956 and 1957

Description	1955 actual	1956 actual	1957 estimate
Budget receipts:			
Individual income taxes . . .	\$31,650,000,000	\$35,337,000,000	\$37,500,000,000
Corporation income taxes . . .	18,265,000,000	21,297,000,000	21,500,000,000
Excise taxes* . . .	9,211,000,000	10,004,000,000	9,300,000,000
Employment taxes . . .	6,220,000,000	7,296,000,000	7,465,000,000
Estate and gift taxes . . .	936,000,000	1,171,000,000	1,210,000,000
Customs . . .	606,000,000	705,000,000	725,000,000
Miscellaneous receipts . . .	2,566,000,000	2,987,000,000	3,160,000,000
Subtotal . . .	69,454,000,000	78,796,000,000	80,860,000,000
Deduct			
Transfer to federal old-age and survivors' insurance trust fund . . .	5,040,000,000	6,337,000,000	6,500,000,000
Transfer to railroad retirement trust fund . . .	599,000,000	634,000,000	660,000,000
Refunds of receipts . . .	3,426,000,000	3,684,000,000	3,900,000,000
Total budget receipts* . . .	60,390,000,000	68,141,000,000	69,800,000,000
Budget expenditures:			
Major national security . . .	40,626,000,000	40,478,000,000	40,824,000,000
International affairs and finance . . .	2,181,000,000	1,852,000,000	2,144,000,000
Veterans' services and benefits . . .	4,457,000,000	4,757,000,000	4,827,000,000
Labour and welfare . . .	2,552,000,000	2,776,000,000	3,001,000,000
Agriculture and agricultural resources . . .	4,411,000,000	4,914,000,000	5,744,000,000
Natural resources . . .	1,081,000,000	961,000,000	1,133,000,000
Commerce and housing* . . .	1,622,000,000	2,165,000,000	1,970,000,000
General government . . .	1,201,000,000	1,631,000,000	2,093,000,000
Interest . . .	6,438,000,000	6,852,000,000	7,156,000,000
Allowance for contingencies . . .	—	—	200,000,000
Total budget expenditures* . . .	\$64,570,000,000	\$66,386,000,000	\$69,093,000,000
Budget deficit (–) or surplus (+) . . .	–\$4,180,000,000	+\$1,754,000,000	+\$707,000,000

*Public law 627, 84th congress, provided that certain receipts from excises on motor fuel, tires and vehicles would go into a trust fund from which federal-aid highway expenditures would be made in 1957 and succeeding years. Previously, receipts and expenditures of this nature were included in the budget totals. To this extent, the 1957 estimates for the items indicated above are not comparable to the figures for previous years. The amounts involved (in millions of dollars) are as follows: budget receipts—977 in fiscal 1955 and 1,055 in 1956; budget expenditures—595 in fiscal 1955 and 740 in 1956; trust fund receipts—1,500 in fiscal 1957; trust fund expenditures—1,150 in fiscal 1957.



WAIT A WHILE—I THINK I HAVE IT!" a 1956 cartoon by Fischetti of the IEA Service, Inc.

The budget report noted that "major national security programs"—the military functions of the department of defense, the military portion of the Mutual Security program, atomic energy and stockpiling and defense production expansion—accounted for about 60% of the 1957 budget. Expenditures for these programs, estimated at \$40,800,000,000 for 1957, had risen from \$13,000,000,000, or 32% of the total budget, in fiscal year 1950, the last full year before the outbreak of aggression in Korea, to a peak of \$50,400,000,000, or 68% of the budget, in 1953. National security outlays in 1955 and 1956 were approximately \$40,500,000,000.

The next largest expenditure category was interest. Payments of interest, primarily on the national debt, were estimated at little over \$7,100,000,000 for fiscal 1957, or 10% of the total budget. Expenditures for agricultural programs, totalling \$5,700,000,000, amounted to more than 8%. Veterans' benefits were expected to absorb about \$4,800,000,000 of the \$69,100,000,000 expenditure aggregate. Outlays for labour and welfare programs were estimated at \$3,000,000,000. The remainder of the 1957 budget, covering a wide variety of functions, amounted to \$7,000,000,000, or 11%.

Major National Security.—Of the \$40,824,000,000 total of national security expenditures estimated for fiscal year 1957, \$36,000,000,000, or 88%, was allocated for military functions of the department of defense. This was a few hundred million dollars higher than in 1955 or 1956 but \$4,300,000,000 less than in 1954. It was reported in the budget review that the nation's military forces in 1957 would be "stronger and more effective than in any previous year in peacetime history."

Expenditure increases in 1957 over 1956 were anticipated for operation and maintenance ("due to the growing number of complex new weapons and techniques"), reserve components, research and development (because of the added emphasis given to aircraft and guided-missile projects) and retired pay. The largest expenditure reduction (\$562,000,000) was listed for major procurement. It centred in conventional ammunition and support vehicles, with outlays for guided missiles scheduled to increase markedly.

Expenditures for military functions of the Mutual Security

program amounted to \$2,500,000,000 in the 1957 budget, approximately the same as in 1956. These expenditures cover military equipment and training for friendly nations.

Atomic Energy commission outlays for 1957 were recorded at \$1,980,000,000 in the budget report. These would be the highest in history, and \$326,000,000 above 1956. Increased spending was projected for the procurement of uranium concentrates, for the development of atomic reactors for military propulsion (ships and aircraft) and for civilian atomic power.

Net expenditures for the stockpiling of strategic materials and expansion of defense production were estimated to decline by \$243,000,000 in 1957 from the 1956 level of \$587,000,000. The decline reflected primarily the expectation that several large loans made by the Reconstruction Finance corporation under authority of the Defense Production act would be repaid as the borrowers concluded arrangements for private financing.

International Affairs and Finance.—Budget expenditures for international programs of the government in fiscal 1957 were estimated at \$2,144,000,000, up \$292,000,000 from 1956. The largest part of this increase was for the economic portion of the Mutual Security program, for which outlays would be increased to \$1,750,000,000 as compared with \$1,590,000,000 in fiscal 1956. These increased expenditures were earmarked mainly for the less developed areas of the world, especially in the far east.

Veterans' Services and Benefits.—The revised budget for fiscal year 1957 placed expenditures for veterans' programs at \$4,827,000,000—\$70,000,000 more than in 1956. Increased expenditures were noted for compensation and pensions, hospital construction and readjustment benefits (covering principally education and training). Partly offsetting was a substantial decrease in outlays for veterans' insurance programs. This reflected a nonrecurring reimbursement that was made to the national service life insurance fund in 1956.

Labour and Welfare.—Expenditures for labour and welfare programs were estimated at \$3,001,000,000 for 1957, or \$225,000,000 more than in 1956. Increases were projected chiefly in four types of programs—public assistance grants to the states, which were estimated at \$1,571,000,000 for 1957; medical research; grants for the construction of hospital and other health facilities; and the school lunch program.

Agriculture and Agricultural Resources.—Budget expenditures for operating agricultural programs of the government in fiscal 1957 were estimated to be \$830,000,000 more than in 1956. With expenditures in this category showing a marked uptrend, the total of \$5,744,000,000 anticipated for 1957 was more than double average outlays in 1953 and 1954.

The estimated increase from 1956 to 1957 reflected the net effect of: (1) outlays of about \$1,000,000,000 for the new soil bank program; (2) a decline of \$320,000,000 for the Commodity Credit corporation price support and commodity purchase program; and (3) a rise of \$150,000,000 for all other agricultural activities of the government. In the last category, the largest increase (\$86,000,000) was for removing surplus commodities from the market and distributing them to schools, charitable institutions and other eligible outlets.

Natural Resources.—The government's programs to conserve and develop natural resources were estimated to require expenditures of \$1,133,000,000 in fiscal year 1957 as compared with \$961,000,000 in the previous year. Increases were scheduled for the flood control, reclamation and multiple-purpose power projects of the corps of engineers and the bureau of reclamation; for a new program by which the government would purchase limited quantities of minerals to help domestic mineral industries adjust from defense-stimulated needs to more normal market conditions; for construction work of the Tennessee Valley authority;

Table II.—Government Receipts and Expenditures—Great Britain
(£ millions)

Receipts	Exchequer Receipts, 1955-56	Estimate, 1956-57	Expenditures	Exchequer Issues, 1955-56	Estimate, 1956-57
Income tax	1,943	2,086	Debt service	674	707
Surtax	139	144	Payments to North Ireland exchequer	59	61
Death duties	176	170	Other	10	10
Stamps	71	59	Total consolidated fund services	744	778
Profits tax and excess profits tax	211	221	Supply services:		
Other inland revenue duties	1	1	Defense	1,405	1,499
Total inland revenue	2,540	2,680	Civil	2,286	2,408
Customs	1,149	1,204	Customs and excise, inland revenue and balance of post office votes	61	53
Excise	865	953	Total supply services	3,752	3,960
Total customs and excise	2,013	2,157	Total ordinary expenditure	4,496	4,738
Motor vehicle duties	87	92	Surplus	397	460
Total receipts from taxes	4,640	4,930	Total	4,893	5,198
Broadcast receiving licences	26	28			
Receipts from sundry loans	30	30			
Miscellaneous	198	210			
Total ordinary revenue	4,893	5,198			

Detail will not necessarily add to totals because of rounding.

for expansion of the national park service; and for a newly established loan fund for the fishing industry.

Commerce and Housing.—Net budget expenditures for commerce and housing programs in 1957 were shown in the midyear budget report to be \$195,000,000 less than in 1956. The decline was the result of the shift of the federal-aid highway program to a separately financed highway trust fund. Federal-aid highway expenditures under the new legislation were expected to be substantially larger than the actual 1956 budget expenditures of \$740,000,000, but were not included in the 1957 budget totals. (See footnote to Table I.)

Apart from federal-aid highways, commerce and housing expenditures were estimated to show a net rise of \$545,000,000 in the fiscal year 1957. This reflected increases in most programs comprising this varied category.

General Government.—Expenditures for general government services and activities in fiscal 1957 were included in the budget at \$2,093,000,000, about \$460,000,000 more than in 1955. The largest single increase, \$292,000,000, was in the federal payment to the civil service retirement and disability fund. In addition, a marked increase was scheduled for outlays to speed modernization or replacement of government buildings.

Interest.—Interest payments by the federal government were expected to rise by \$304,000,000 to a total of \$7,156,000,000 in fiscal year 1957. The advance was attributed to higher market rates of interest. These would increase the amount of interest payable on new securities and on those issued to finance maturing obligations.

Great Britain.—The 1956-57 budget of Great Britain showed total receipts of £5,198,000,000, about £300,000,000 higher than in the preceding year. (See Table II.) This anticipated increase reflected expanded personal incomes and the effects, in their first full year, of the tax changes that had been made in the 1955-56 budget.

Several revisions in tax schedules were proposed in the April 1956 budget document, but were expected to have little net effect on total revenue. They included exemptions from income tax of the first £15 of interest received from certain savings institutions and of premiums (not to exceed £500 or 10% of earned income) for the purchase of life annuities by self-employed persons. Approximately offsetting these reductions, estimated to cost from £40,000,000 to £60,000,000 on a full-year basis, were increases in the tax rates on distributed and undistributed profits and higher customs duties on tobacco.

Total budget expenditures were estimated to increase from £4,496,000,000 in fiscal 1955-56 to £4,738,000,000 in fiscal 1956-57. Defense costs, comprising about one-third of total expenditures, were scheduled to advance by £94,000,000. Higher expenditures for the national health service, assistance to local

areas (chiefly for education) and national debt service largely accounted for the remainder of the estimated increase in governmental outlays.

The 1956-57 budget provided for a surplus of £460,000,000. This was slightly larger than the £397,000,000 surplus of ordinary receipts over ordinary expenditures in the preceding year.

(See also DEBT, NATIONAL; INCOME AND PRODUCT, U.S.; TAXATION; UNITED STATES.) (C. F. Sz.)

Buhl Foundation: see SOCIETIES AND ASSOCIATIONS, U.S.

Building and Construction Industry. Since the end of World War II, building and construction activity in the United States each year has exceeded the previous 12-month period, and estimates of the future have constantly been revised upward. In the first nine months of 1956, the value of construction work put in place amounted to about \$32,700,000,000, or about 2% over the comparable period of the previous year. (See Table I.) This was equivalent to an annual rate of \$44,500,000,000, compared with actual outlays of \$43,000,000,000 in 1955.

The advances were made despite the fact that private residential construction, while constituting about one-third of the total, declined by 9% as a result of a contraction in the availability of mortgage credit. The drop in this sector was more than compensated by increases in virtually all other types of private building activity. The construction of factories and other industrial plants rose by 29%, and expenditures for commercial buildings, including offices, warehouses, stores and restaurants, were 13% higher than the previous year.

Expenditures for public construction, which constituted about 30% of the national total in the first nine months of 1956, were 6% above the January to September total in 1955. The construction of schools, highways, sewer and water facilities, and public service enterprises were at peak levels, while public industrial construction, consisting principally of atomic installations, sagged to half of the previous year's total. Public residential building showed a moderate decline of 5% in the first nine months, but it was anticipated that the year-end total would equal or exceed 1955 levels.

Construction Costs.—As the volume of construction moved upward, the pressure on building resources increased and the amount of construction that a dollar could purchase shrank. The composite cost index of the department of commerce reached a new high of 131.3 (1947-49=100) in July 1956, continuing the regular increases that began earlier in the year. The index for July 1955 was 5% higher than a year earlier with three-fourths of the advance taking place in the latter half of the previous 12-month period. The various types of construction, ranging from

small frame residences to heavy engineering projects, showed about the same general increase in cost.

The wholesale prices of basic building materials jumped 4% between July 1955 and July 1956, according to the bureau of labour statistics index, with most of the change taking place in the latter half of 1955. With the exception of some lumber products, iron fixtures and insulation, the prices of virtually all materials showed increases in the course of the year. The greatest price increases were found in plumbing fixtures (up 19%), asphalt roofing (up 7%), hardwoods (up 7%) and building board (up 6%). The price of structural steel shapes remained unchanged, not yet reflecting the rise in steel prices that followed the signing of new and higher wage contracts during July 1956.

In midyear 1956, the output of most major building materials was at lower levels than in the same point of the previous year. The greatest decline was in the production of asphalt products, which was 19% lower in June 1956, than in the comparable month of 1955. The manufacture of heating and plumbing equipment and mill work each declined 13%, during this period, while paint and wood products declined 10% and 9% respectively. The mixed character of the market is shown, however, by the fact that the output of portland cement, iron and steel products, and clay construction products, was higher in June 1956 than in any previous June.

Employment and Earnings.—It always had been known that the building and construction industry was an important source of employment for United States workers. A recent revision of the estimates of employment in this industry undertaken by the bureau of labour statistics revealed that the previous statistics, particularly those for the more recent years, were marked understatements. For the year 1955, the previous data showed a

Table II.—Average Union Wage Scales for Selected Trades, July 1956

Trade	High	Rate level		Increase July 1955-July 1956 Cents per hour	Per cent
		Aver- age	Low		
Bricklayers	\$4.05	\$3.63	\$2.50	16	5
Carpenters	3.65	3.13	1.88	12	4
Electricians	4.00	3.33	2.38	16	5
Painters	3.35	3.02	1.75	15	5
Plasterers	4.00	3.47	2.25	11	3
Plumbers	3.75	3.34	2.40	15	5
Building labourers	3.00	2.18	1.00	14	7

Source: Bureau of Labor Statistics.

total employment of 2,506,000 workers, while the revised figure put the level at 2,780,000. The sharpest revisions came in figures for the summer months, with June 1955 having been estimated at 2,928,000 instead of 2,615,000 shown in the previous tabulations.

On the basis of the revised data, total employment in the industry stood at 3,296,000 in July 1956, an increase of 264,000 over the same month of the previous year. Special trade contractors (plumbing, heating, electrical work, etc.) engaged approximately one-half of the workers and general contractors one-third. The remainder were employed on streets, highways and other nonbuilding activities.

Increases in the work hours and in hourly earnings brought the wages of building workers to \$103.25 a week in June 1956, the highest amount on record. This figure was \$2.64 above the previous peak which occurred in Sept. 1955, and stood \$6.62 above the June 1955 average. Hourly earnings for the industry as a whole, which averaged \$2.71 in June 1956, (14 cents over June 1955) also set a new record. The average work week during this month was 38.1 hours, or one-half hour longer than a year earlier.

The trade union wage scales in the building industry experienced substantial increases in the course of the year. With few exceptions, minimum union rates rose in all areas of the United States, and the average hourly rates increased for all crafts. (See Table II.) Bricklayers, electricians, painters and plumbers received average increases of 15 or 16 cents per hour, a rise equivalent to 5% of their previous rates. Increases in other crafts were slightly lower, ranging from 11 to 14 cents per hour. Thus, by July 1955, organized building workers could again lay claim to being among the highest paid in the nation, with bricklayers receiving \$3.63 on the average for straight time and building labourers drawing \$2.18 per hour on the average.

The National Highway Program.—A national highway program of unprecedented scope was passed by congress in 1956 after years of discussion and investigation. During the next 13 years it was anticipated that more than \$100,000,000,000 would be spent by federal, state and local governments for land acquisition and engineering in addition to the untold billions that would be

Table I.—Value of New Construction Put in Place in the U.S., Sept. 1956*

Type of construction	Value (in \$000,000)			Per cent change		Value		Per cent change,	
	Sept. 1956	Aug. 1956	July 1956	1955 Sept.	1956 Aug.	1955 Sept.	1956 First 9 months	1955 1st 9 mo., 1955-56	1955-56
Total new construction	\$4,267	\$4,279	\$4,213	\$4,148	†	+3	\$32,691	\$31,994	+2
Private construction	2,840	2,862	2,849	2,879	-1	-1	22,758	22,664	†
Residential building (nonfarm) . . .	1,416	1,422	1,430	1,561	†	-9	11,306	12,388	-9
New dwelling units	1,235	1,240	1,245	1,410	†	-12	9,950	11,190	-11
Additions and alterations	140	140	142	119	0	+18	1,030	955	+8
Nonhousekeeping	41	42	43	32	-2	+28	326	243	+34
Nonresidential building (nonfarm) . .	784	786	786	714	†	+10	6,436	5,497	+17
Industrial	273	273	268	213	0	+28	2,236	1,733	+29
Commercial	289	294	301	303	-2	-5	2,454	2,170	+13
Office buildings and warehouses . .	126	123	115	102	+2	+24	973	809	+20
Stores, restaurants, garages . . .	163	171	186	201	-5	-19	1,481	1,361	+9
Other nonresidential building	222	219	217	198	+1	+12	1,746	1,594	+10
Religious	72	70	66	69	+3	+4	545	538	+1
Educational	49	49	48	45	0	+9	394	358	+10
Hospital and institutional	30	28	26	31	+7	-3	233	265	-12
Social and recreational	27	27	26	22	0	+23	196	177	+11
Miscellaneous	44	45	51	31	-2	+42	378	256	+48
Public construction	148	161	159	159	-8	-7	1,185	1,259	-6
Public utility	480	481	462	433	†	+11	3,744	3,391	+10
Railroad	40	39	39	36	+3	+11	319	270	+18
Telephone and telegraph	85	90	85	76	-6	+12	720	584	+23
Other public utility	355	352	338	321	+1	+11	2,705	2,537	+7
Other private	12	12	12	12	0	0	87	129	-33
Public construction	1,427	1,417	1,364	1,269	+1	+12	9,933	9,330	+6
Residential building	24	23	23	22	+4	+9	189	199	-5
Nonresidential building	383	390	381	374	-2	+2	3,046	3,270	-7
Industrial	43	42	38	45	+2	-4	325	613	-47
Educational	229	235	231	221	-3	+4	1,909	1,844	+4
Hospital and institutional	32	32	30	32	0	0	234	258	-9
Other nonresidential building . . .	79	81	82	76	-2	+4	578	555	+4
Military facilities	148	143	133	136	+3	+9	1,008	948	+6
Highway	615	600	575	533	+3	+15	3,780	3,328	+14
Power and water	123	127	123	100	-3	+23	950	819	+16
Public service enterprises	50	51	48	35	-2	+43	351	201	+75
Conservation and development . . .	65	65	64	53	0	+23	477	448	+6
Other public	19	18	17	16	+6	+19	132	117	+13

*Joint estimates of the U.S. Department of Labor and the Department of Commerce. †Change of less than 0.5%.

invested in ancillary facilities and installations. Between 1957 and 1969, more than 40,000 mi. of reinforced concrete and asphalt highways would be constructed, forming a network that would link all cities with a population in excess of 50,000 persons. In addition, the established program of primary, secondary and urban road systems carried forth with federal aid would be continued, and in all probability there would be an increase in the construction of state and local roads outside the other systems.

According to estimates of the U.S. bureau of public roads and the American Road Builders association, the expanded highway construction program would require between one-half and two-thirds more materials than were currently being absorbed by road building. These included such materials as steel, cement, lumber, concrete, petroleum products and explosives, all of which were in demand for other types of construction activity. Moreover, enormous amounts of new equipment would be required, involving additional billions of expenditure.

Approximately 1,000,000 new jobs would be created by the program, half of which would be on the road and half in the off-site production of materials and in planning and design.

Urban Renewal.—The attempts to eliminate slum and blighted areas and to place valuable urban land into pleasant and productive use moved forward in 1956. By July 31, the Urban Renewal administration reported that capital grant reservation amounting to \$670,000,000 to subsidize the write-down of slum land had been made for 386 projects located in 233 areas throughout the United States and its possessions. Plans for 127 projects had been approved for execution, and an additional 258 were in either the preliminary or final planning stages.

To further this program, congress, in the Housing act of 1954, made provision for experimental studies of methods and techniques that could be devised in a field in which little experience had been accumulated. By mid-1956, 13 such "section 314" demonstration projects were under way in a number of cities with a variety of approaches.

In New York city, a 20-block area on the west side of Manhattan was being subjected to intensive study to determine those structures that should be demolished, those that should be remodelled or reconditioned, and those that should be left untouched. A team of architects, engineers, economists, lawyers and population housing experts began work in the summer of 1956, and a report containing a program of action was due early in 1957.

Philadelphia, Pa., received section 314 funds to conduct a leadership program in four areas of that city that had declined but had not reached a slum state. An attempt was being made on the neighbourhood level to secure the voluntary co-operation of both landlords and homeowners to make needed repairs, adapt the dwellings to more satisfactory family use and to improve the appearance of structures. A considerable degree of success was reported, but some resistance came from homeowners with low incomes and from absentee landlords who held their properties on their equities.

A grant was also given to the city of Cleveland, O., to help establish a neighbourhood improvement centre to provide professional help on architecture, construction and mortgage finance to property owners undertaking rehabilitation work.

Detroit, Mich., was studying the causes of civic decay and organizing the aids available to rebuild and rehabilitate its blighted sectors. The study sought to find an optimum balance between conservation and rehabilitation and determine its relationship to a long-range capital improvement program for that city.

In July 1956, the Urban Renewal administration announced a major change in its application and reporting procedures de-

signed to shorten the time for local communities to get slum clearance and rehabilitation projects and to reduce red tape and paperwork in qualifying for federal urban renewal assistance. This measure was presumably taken in response to the appeals of local communities who alleged that their renewal programs had been delayed by the length of time necessary to secure clearance from Washington, D.C.

In general, the changes placed great emphasis on direct review and consultation on local progress through the use of field personnel, and less on the review of detailed documentation by the central office. In addition, the streamlining eliminated the interim planning reports on renewal projects and required only general data on the character and nature of an area at the time of application, leaving the final determination until detailed planning and survey data were developed.

(See also ARCHITECTURE; BUSINESS REVIEW; HOUSING; TOWN AND REGIONAL PLANNING.) (CH. RA.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Building America's Houses* (1947); *The Living City* (1953).

Bulganin, Nikolai Alexandrovich

(1895–), Soviet political

leader, was born at Nizhny Novgorod (now Gorky), June 11. He joined the Communist party in 1917 and from 1922 held executive posts in the Higher Council of National Economy. From Jan. 1931 he was secretary of the Moscow city committee or "mayor" of the Soviet capital. He became chairman of the council of people's commissars of the R.S.F.S.R. in 1937 and during 1938–41 he was also deputy chairman of the council of people's commissars of the U.S.S.R. and head of the state bank. In 1934 he was elected a member of the central committee, but he was appointed a substitute member of the Politburo only in 1946 and a full member in Feb. 1948. He first donned military uniform in Oct. 1941 as political commissar to G. K. Zhukov's army group. In 1944 his mission was to organize the so-called Polish Committee of National Liberation which he brought to Lublin as the Polish provisional government. On Dec. 22, 1944, he succeeded K. E. Voroshilov as deputy commissar of the Soviet armed forces. He was appointed a deputy chairman of the Soviet council of ministers on March 19, 1946, and on March 3, 1947, as a marshal of the Soviet Union, he succeeded J. V. Stalin as minister of the armed forces. On March 24, 1949, he was relieved of the latter duties, becoming the chief inspector of the Soviet satellite armies.



PREMIER BULGANIN (left) offering a toast at a garden party given for U.S. air force chief of staff Gen. Nathan F. Twining (right) and other members of a U.S. military mission which visited the U.S.S.R. in 1956

In March 6, 1953, after Stalin's death, he was appointed one of the four deputy chairmen of the council of ministers and minister of the armed forces. When G. M. Malenkov resigned as chairman of the Soviet council of ministers on Feb. 8, 1955, Bulganin succeeded him.

During April 18–28, 1956, with N. S. Khrushchev, he paid an official visit to the United Kingdom. On Oct. 17 he sent a message to Pres. Dwight D. Eisenhower concerning the tests of atomic weapons. On Oct. 19, in Moscow, together with Ichiro Matsuyama, the Japanese premier, he signed a declaration terminating the state of war between the U.S.S.R. and Japan. On Nov. 1 he wrote to Eisenhower concerning the Suez crisis. In almost identical notes sent on Nov. 5 to Sir Anthony Eden and Guy Mollet, he spoke of Soviet willingness to "crush the aggressors."

Bulgaria. A people's republic in the eastern part of the Balkan peninsula, Bulgaria is bounded north by Rumania, west by Yugoslavia, south by Greece and east by Turkey and the Black sea. Area 42,796 sq. mi. Pop.: (1946 census) 7,022,796; (1955 est.) 7,548,000. Language (1947 est.): Bulgarian 85%; Turkish 9.8%. Religion (1947 est.): Greek Orthodox 75%; Moslem 11.5% (of which one-sixth Pomaks, or Moslem Bulgars, remainder Turks); Roman Catholic 0.9%; Gregorian Armenian 0.4%; Jewish 0.3%; Protestant 0.2%. Chief towns (1946 census; 1953 est. in parentheses): Sofia (cap.) 434,798 (600,000); Plovdiv 125,440 (150,000); Varna (1947 est.) 279,792; Russe 53,420; Burgas 43,684; Dimitrovgrad (1955 est.) 100,000. First secretary of the Bulgarian Communist party, Todor Zhivkov; chairman of the presidium of the national assembly, Gen. Georgi Damianov; chairmen of the council of ministers in 1956: Vlko Chervenkov and (from April 17) Anton Yugov.

History.—The main feature of the year 1956 was the reaction of the leadership of the Communist party to the Soviet denunciation of Stalin and the upheavals which followed in eastern Europe. In the case of Bulgaria the reaction was closely linked with Bulgarian-Yugoslav relations, and the bitter mistrust of Marshal Tito for the Bulgarian Communist leader, Vlko Chervenkov. In the eyes of the Yugoslav government, Chervenkov embodied the Stalinist method of domination in the people's democracies, and was also regarded as a traitor to Yugoslav-Bulgarian friendship.

In April the first public attacks on Chervenkov in Bulgaria appeared, and they were followed by a special plenary session of the central committee at which Chervenkov's removal from the premiership was decided upon, on the grounds of the damage which his devotion to the "cult of personality" had done to the country. The formalities of his resignation and of the election of his successor, the former Communist minister of the interior, Anton Yugov, were completed at a special session of the national assembly on April 16. Chervenkov remained in the government as a deputy premier. At the same time, a commission was set up to examine the case of the former Communist leader, Micho Kostov, who had been executed in 1949 for Titoism. On Oct. 18 the commission reported that Kostov had been sentenced on false evidence, and the government ordered his posthumous rehabilitation.

The Bulgarian people reacted to the change of prime ministers with mixed feelings. Some believed that it had come about at the instigation of Marshal Tito, while others felt that the change had not altered the Stalinist complexion of the party leadership. A number of Communist intellectuals called for greater freedom of the press and a revision of party policy in agriculture and industry. At this the government took fright and took punitive action against those who put forward such demands. An article in the party organ *Rabotnichesko Delo* on Sept. 22 maintained that under no circumstances must hostile criticism

be tolerated, because it was directed against the state. The same determination not to allow any relaxations of its dictatorship was in evidence throughout the Polish and Hungarian disturbances. It was clear that the policy of the Bulgarian Communist party was to rely on such methods rather than risk political upheavals through liberalization.

In agriculture, the government continued the rapid collectivization of the land. On Sept. 9 it was announced that 88% of all peasants had joined the farms, bringing with them 77% of the country's arable land.

The city of Varna, renamed Stalin, reassumed its ancient name. (M. MACK.)

Education.—Schools (1953): nursery 5,919, pupils 264,892; (1950) primary 6,112, pupils 755,628, teachers 18,801; higher primary 2,960, pupils 308,160, teachers 12,636; secondary 218, pupils 112,633, teachers 4,624; (1952) vocational, pupils 67,679; institutions of higher education (1956) 22, students 33,000, teaching staff 2,800.

Finance.—Budget (1956 est.): revenue 18,474,400,000 leva; expenditure 17,574,400,000 leva. Monetary unit: lev (pl. leva) with an official exchange rate, high and fictitious, of 6.80 leva to the U.S. \$1.

Foreign Trade.—(UN Economic Commission for Europe's estimates, in U.S. dollars, 1954.) Trade turnover with all countries \$410,000,000, including \$370,000,000 with the countries of the Communist group.

Transport and Communications.—Highways (1955) 13,780 mi. Licensed motor vehicles (Dec. 1955): cars 5,000, commercial 11,200. Railways (1952): 2,670 mi. Telephones (1954 est.): 61,000; radio receiving sets (1952) about 300,000, including 78,000 community loud speakers.

Agriculture.—Main crops (metric tons, 1934–38 average; 1948–50 in parentheses): wheat 1,690,000 (1,503,000); maize 913,000 (890,000); barley 365,000 (249,000); rye 264,000 (170,000); oats 122,000 (97,000); potatoes 109,000; tobacco 31,200 (20,000); sugar, raw 18,000 (58,000). Wine production (1938; 1949 in parentheses): 2,373,000 (426,000) hl. Livestock (1939; 1953 est. in parentheses): sheep and goats 11,000,000 (8,400,000); cattle 1,640,000 (1,700,000); pigs 1,084,000 (2,074,000); horses 584,000 (460,000). Wool production, greasy basis (1934–38; 1951 in parentheses): 9,600 (12,700).

Industry.—Production (metric tons if not otherwise stated, 1938; 1955 est. in parentheses): coal 146,000 (400,000); lignite 1,942,000 (9,900,000); electricity 202,000,000 (2,100,000,000) kw.hr.; steel (1955) 200,000; cement 194,000 (825,000); sulphuric acid 6,900 (32,400); cotton fabrics 33,000,000 (139,000,000) metres.

Burke, Arleigh Albert (1901–), U.S. naval officer, was born Oct. 19 at Boulder, Colo., and was graduated from the U.S. naval academy at Annapolis, Md., in 1923, later taking an M.S. degree from the University of Michigan, Ann Arbor. As an ensign he served aboard the U.S. battleship "Arizona." Placed in command of a destroyer division and later a destroyer squadron in 1943, he earned the nickname of "31-Knot Burke" because of his swift and hard-hitting destroyer attacks on the Japanese fleet and merchant marine in the Pacific during World War II. After the war he was leader of the so-called "admirals' revolt" against unification of the U.S. armed forces; at the same time he opposed the air force's advocacy of B-36 long-range atomic bombers as the key to U.S. strategic offense and proposed instead the construction of a fleet of supercarriers by the navy. Burke was advanced to the rank of rear admiral in June 1950, serving thereafter in the Korean war. At the time of his appointment on May 25, 1955, by Pres. Dwight D. Eisenhower as chief of naval operations, Burke was commander of the U.S. navy's Atlantic destroyer staff and 93rd on the list of ranking naval line officers. His appointment to succeed Adm. Robert B. Carney was effective Aug. 16, 1955, with the rank of full admiral.

In July 1956 Burke was reported to have disagreed with a plan attributed to Adm. Arthur W. Radford (*q.v.*), chairman of the U.S. joint chiefs of staff, to reduce U.S. armed forces personnel by 800,000 before 1961.

Burma. An independent federal republic on the eastern side of the Bay of Bengal, Burma lies between Pakistan and India on the northwest, Tibet on the north and China, Laos and Thailand (Siam) on the east. The republic comprises Burma proper, the Karen, Shan, Kachin and Kayah states, and the Chin special division. Area: 261,757 sq. mi. Pop.: (1941 census) 16,823,798; (1955 est.) 19,434,000. Racially, the peoples of Burma

are Mongoloid. Religion: Buddhist (90%). Language: Burmese (66%). Largest indigenous minorities: Karens, Shans, Kachins, Chins, etc. Largest immigrant minorities (1955 est.): Indian 600,000, divided equally between Moslems and Hindus; Chinese 350,000. Chief towns (pop., 1953 preliminary census): Rangoon (cap.) 711,520; Mandalay 182,367; Moulmein 101,720. President of the republic, Ba U; prime ministers in 1956: Nu and (from June 12) Ba Swe.

History.—The Karen and communist rebellions continued throughout 1956. The amnesty offer made in Oct. 1955 expired in April and it was estimated that 3,000 Karens and 5,000 communists then remained under arms. About 3,000 Chinese nationalists were also thought to be living in scattered groups along the Burma-Thailand frontier, but they were relatively quiescent.

The chamber of deputies was dissolved by the president as from March 1 and elections were held on April 27. Voting for the 125 seats in the upper house started on May 22, but was delayed in some constituencies because of security and other difficulties. A number of the 250 seats in the lower house were also left unfilled for the same reasons; of the 233 results announced by the middle of May, the governing group, the Anti-Fascist People's Freedom (Socialist) league, had secured 144 seats and its allies 25, while the principal opposition group, the Burma National United Front, secured 46. The B.N.U.F. claimed that it supported A.F.P.F.L. policy generally, but disagreed with it on policy toward the rebellion; it supported a negotiated settlement and the readmission of the Communist party into political life.

The relative success of the B.N.U.F. provoked some alarm in the A.F.P.F.L., and Nu, the prime minister, resigned, ostensibly to devote his energies to revivifying the A.F.P.F.L. of which he was president, though he later expressed his intention of resigning this position at the league congress in Jan. 1957. On June 12 he was succeeded by Ba Swe. It was suggested that Nu would return to office after a year, and he continued to play an important part in the conduct of government business, especially foreign affairs.

The two principal economic problems faced by the government were the advantageous disposal of rice exports and the control of inflation.

In order to dispose of its rice Burma undertook a number of

barter agreements with communist countries. The goods sent in return were not always those required by Burma, or were of bad quality, or arrived in embarrassing quantity. As a result, by the summer, when inquiries for rice for cash were coming in from other customers, the barter deals had become something of an embarrassment to Burma. The textile position was improved by a series of deals with Japan, India, the German Federal Republic and Great Britain for the supply of textiles against raw cotton made available to Burma by the United States for Burmese currency. In addition to barter agreements with eastern European countries, an agreement with India, under which the latter was to purchase 2,000,000 tons of rice over five years, was announced on May 23. The agreement, which aimed at balancing trade between the two countries, was signed on Sept. 5. On May 4 the government secured two loans totalling \$19,350,000 from the International Bank for Reconstruction and Development and on Sept. 25 decided to accept a loan of \$25,000,000 for economic development from the United States.

Burma's relations with China were overshadowed by reports during the summer of incursions by Chinese troops into the Wa area and the Kachin state in northern Burma. A joint communiqué issued on Nov. 9 and a statement by Nu on Nov. 10 made it clear that, in return for a withdrawal of Chinese troops behind the boundary fixed in 1941 in the Wa area, the Burmese would have to surrender the Namwan assigned tract, a narrow wedge of territory running into Burma hitherto held on perpetual lease from China, and also three areas commanding passes from China in the Kachin state. During negotiations on this issue Nu visited China at the end of October and Chou En-lai, the Chinese prime minister, visited Burma during December. (A. S. B. O.)

Education.—Schools (state only, March 1955): primary 8,951, pupils 1,096,000, teachers (1954-55) 23,337; secondary and middle 625, pupils 146,200, teachers (1954-55) 4,660. Pupils in private schools (1954) 82,200. Vocational schools and institutes 8 (including 3 artisan training centres with 2,235 pupils). Teacher training institutes (1955-56) 4, students 1,570. University of Rangoon (including intermediate colleges and branches) medical college, Mandalay, students (1955) 9,000.

Finance and Banking.—Monetary unit: kyat with an average exchange rate of 4.776 to the U.S. dollar in 1955 and 4.75 in Feb. 1956. Budget (1953-54 actual) revenue 996,000,000 kyats, expenditure (current) 756,000,000 kyats, (capital) 544,000,000 kyats; (1956-57 est.) revenue 891,000,000 kyats, expenditure 877,000,000 kyats. Currency circulation (Dec. 1954) 574,800,000 kyats, (Aug. 1955) 701,600,000 kyats. Deposit money (Dec. 1954) 284,400,000 kyats, (Dec. 1955) 398,500,000 kyats. Gold and foreign exchange holdings (Dec. 1954) U.S. \$142,400,000, (Dec. 1955) U.S. \$116,400,000.

Foreign Trade.—(1955): Imports 856,500,000 kyats; exports 1,079,400,000 kyats. Main sources of imports (1955): India 18%; U.K. 26%; other sterling area 8%; continental E.P.U. (European Payments Union countries) 16%; Japan 21%; U.S. and Canada 3%. Main destinations of exports (1955): India 18%; Japan 18%; Ceylon 7%; Indonesia 5%; U.K. 9%; other sterling area 14%. Chief exports (1955): rice 76%; teak 2%; cotton 4%.

Transport and Communications.—Roads (1954): 40,792 km. Motor vehicles in use (1954): passenger 12,900; commercial 11,400. Railways (1955) 2,900 km.; passenger-km. (Sept. 1953-54) 701,000,000; freight ton-km. (Sept. 1954-55) 606,000,000. Telephones (Jan. 1955) 7,200. Radio sets (1952) 15,000.

Agriculture.—Main crops (metric tons, 1955; 1954 in parentheses): rice 6,509,000 (5,804,000); rubber (exports) 10,400 (12,400); sesame 44,800 (36,400); peanuts 208,000 (156,000); cottonseed 39,000 (35,000); cotton, lint 20,000 (18,000); tobacco (1954) 48,300 (47,800 in 1953); sugar, raw value (1954) 23,000 (25,000 in 1953); dry beans (in 1953) 115,000. Livestock (excluding Shan and Kayah states, March 1954): oxen 4,731,000; sheep 33,000; buffaloes 826,000; pigs 480,000; goats 222,000. Timber (round logs, 1955-56): 706,230 cu. tons (including 162,301 cu. tons of teak).

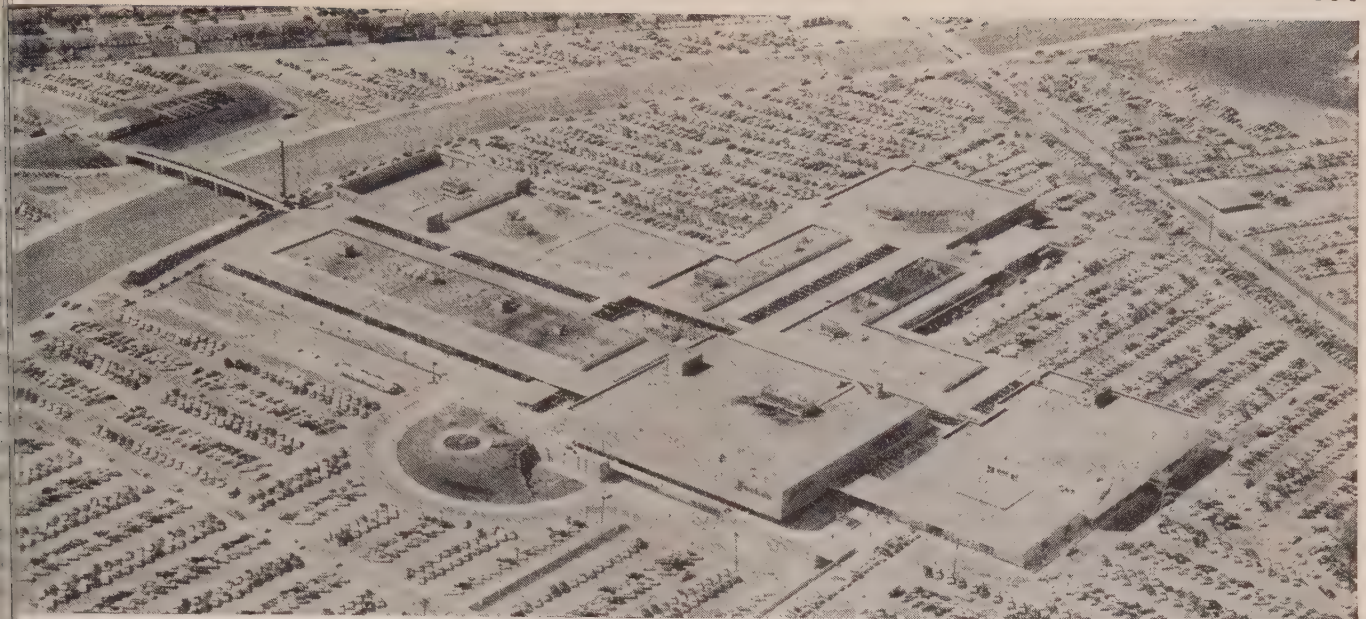
Industry.—Electricity consumption (Rangoon area, 1954) 48,756,000 kw.hr. Production (metric tons, 1955): tin concentrates (metal content) 960; crude oil 199,200; cement (1954) 58,900; other minerals (metal content, 1954), lead 22,900, zinc (April 1953-54) 11,500, tungsten 450, silver (1953) 20,900.

Buses: see MOTOR TRANSPORTATION; URBAN TRANSPORTATION U.S.

Business Review. Sparked by the continued high level of federal government spending for national defense, the unprecedented expansion in business investment for new plants and equipment, and the high and rising volume of consumer demand backed by a high and rising volume



"THE CHINESE CULTURAL MISSION IS COMING," a 1956 cartoon from Hanthawaddy, a Burmese newspaper in Rangoon



GULFGATE SHOPPING CITY, outside Houston, Texas, a \$32,000,000 shopping centre, largest in the south, opened Sept. 20, 1956

disposable personal income augmented by further expansion in consumer credit, the economy of the United States expanded broadly in 1956. New all-time high levels of activity were recorded in almost every sector of the economy except agriculture, which continued to be depressed for the fifth consecutive year.

The upturn in business activity which began in the fourth quarter of 1954 as readjustments to the changes in demand incident to the cessation of the Korean war were completed, continued without interruption and at an accelerated rate throughout 1955. During the first three quarters of 1956, the high levels of economic activity reached in the fourth quarter of 1955 were maintained, and in many sectors of the economy new all-time high levels were reached. Reflecting the accelerated rate of expansion in the economy and, in part, feeding it, disposable personal income increased rapidly through the first three quarters of 1956, and in the third quarter was at an all-time high seasonally adjusted annual rate of \$288,800,000,000.

Production of consumer goods tended to keep pace with rising consumer demand during the first four months of the year with the result that retail prices remained relatively unchanged at the 1955 level through April. From May through July food prices increased substantially, and prices of apparel and rents moved upward. The pressure of expanding demand on supply, however, was reflected in the behaviour of wholesale commodity prices other than farm products and foods which rose sharply during the last two quarters of 1955, and continued to rise with only minor interruptions through the first three quarters of 1956. Wholesale prices of farm products and processed foods also made net gains.

Heavy demands for funds by business concerns during the first three quarters of the year resulted in a sharp increase in business loans at commercial banks, and in meeting this strong private demand for loans banks continued to sell United States government securities in large volume. Interest rates rose in March and April reflecting the strong demand for credit and the pressure on commercial bank reserves. Following advances in market rates of interest federal reserve credit policy shifted in late 1955 and in 1956 from a position of ease to restraint in inflationary pressures, and discount rates at federal reserve banks were raised from 1.5% to 3.0%.

National Product.—The gross national product or expenditure representing the total of personal consumption expenditures, gross private domestic investment, net foreign investment, and total federal, state and local government expenditures rose

steadily throughout the four quarter period ending with the third quarter of 1956. In the third quarter of 1956, the gross national product as reported by the department of commerce was at a seasonally adjusted annual rate of \$413,000,000,000, a new all-time high. This high annual rate in the third quarter of the year represented an increase of \$16,200,000,000 in annual rate from the third quarter of 1955, and of \$9,600,000,000 from the first quarter of 1956.

In the third quarter of 1956, the department of commerce reported personal consumption expenditures at a seasonally adjusted annual rate of \$267,000,000,000, an increase of \$9,200,000,000 from the third quarter in 1955, and of \$5,300,000,000 from the first quarter of 1956. Gross private domestic investment after reaching a new high annual rate of \$65,100,000,000 in the last quarter of 1955 dropped to \$63,100,000,000 in the first quarter of 1956, but was stepped up to \$64,200,000,000 in the second quarter where it remained substantially unchanged through the third quarter of the year, at a rate \$1,700,000,000 above the third quarter of 1955.

The decline in the annual rate of gross private domestic investment in the first quarter of 1956 was due primarily to the sharp drop from the fourth quarter of 1955 in business inventories, which continued to decline sharply through the second and third quarters of the year, reaching a low annual rate of \$1,000,000,000 in the third quarter of 1956, a drop in annual rate of \$5,100,000,000 from the high rate of \$6,100,000,000 in the fourth quarter of 1955. Private domestic investment other than in business inventories, that is, fixed investment in new constructions and producers' durable equipment, mounted steadily throughout the first three quarters of 1956, and the annual rate of \$63,000,000,000 reported by the department of commerce in the third quarter of the year represented a gain in annual rate of \$4,500,000,000 from the third quarter in 1955, and of \$4,000,000,000 from the first quarter of the year.

During the last three quarters of 1955, the annual rate of government expenditures, federal, state and local, for goods and services crept up gradually, and the third quarter annual rate of \$78,100,000,000 was an increase of \$1,600,000,000 from the second quarter of 1955. During the first three quarters of 1956, the gradual uptrend was continued and in the third quarter of the year reached \$80,300,000,000, of which \$33,100,000,000 represented state and local government expenditures, and \$47,-

200,000,000, federal government expenditures.

National Income.—The upward trend in the national income, or purchasing power distributed through the economy, which began in the fourth quarter of 1954 continued sharply upward throughout 1955, and through the first two quarters of 1956. At an annual rate of \$338,700,000,000 in the second quarter of 1956, the total was \$3,800,000,000 above the first quarter of the year, \$4,300,000,000 above the fourth quarter of 1955, and \$16,800,000,000 above the corresponding quarter in 1955.

The income flow to employees, as reported by the department of commerce, after reaching a new high seasonally adjusted annual rate of \$230,300,000,000 in the fourth quarter of 1955, continued to increase throughout the first three quarters of 1956, and in the third quarter was at an annual rate of \$240,400,000,000, a gain in rate of \$7,400,000,000 from the first quarter of the year, and of \$13,600,000,000 from the third quarter of 1955.

Corporate profits before tax and after inventory valuation adjustments increased steadily throughout 1955, and in the fourth quarter of 1955 reached a new high annual rate of \$43,400,000,000. The seasonally adjusted annual rate for the year 1955 at \$40,900,000,000 was a new all-time high. During the first two quarters of 1956, the annual rate declined from the fourth-quarter 1955 high, but at an annual rate of \$40,900,000,000 in the first quarter of 1956, and of \$39,800,000,000 in the second quarter, compared favourably with the first two quarters of 1955.

Proprietors' income in business and the professions increased steadily throughout the four quarters of 1955 and continued to increase through the first three quarters of 1956, reaching a new high annual rate of \$29,500,000,000 in the third quarter of 1956. Rental income of persons dropped slowly throughout 1955 to an annual rate of \$9,800,000,000 in the fourth quarter of 1955 and remained at substantially the same rate during the first three quarters of 1956. Net income from interest rose continuously throughout 1955 and continued to increase through the third quarter of 1956 when the seasonally adjusted annual rate reported by the department of commerce was \$12,000,000,000.

The decline in proprietors' income from farming, which had been in process with only minor interruptions since the fourth quarter of 1951, continued through the first two quarters of 1956 and was only slightly reversed in the third quarter when the preliminary estimate by the Council of Economic Advisers of \$11,600,000,000 in the seasonally adjusted annual rate indicated an increase of \$300,000,000 from the second quarter of 1956 and from the third quarter of 1955. The average annual rate for the first three quarters of 1956 at \$11,500,000,000 was

\$300,000,000 below the average rate for the same period in 1955, and \$4,600,000,000 below the average rate for 1951. (See also INCOME AND PRODUCT, U.S.)

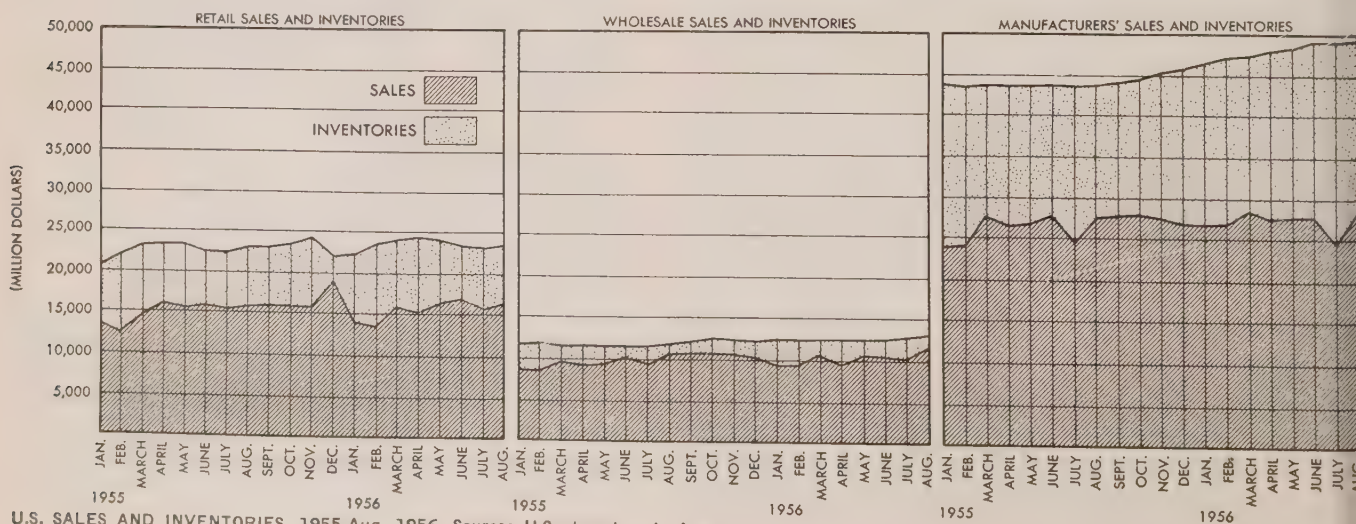
Personal Income, Spending and Savings.—Disposable personal income, that is, personal income after personal taxes, increased markedly after the first quarter of 1955, reflecting the expansion in all segments of the economy except agriculture, and continued to increase during the first three quarters of 1956. Disposable personal income in the third quarter of 1956, according to the preliminary estimate of the Council of Economic Advisers, was at a seasonally adjusted annual rate of \$288,300,000,000, an increase in annual rate of \$8,100,000,000 from the first quarter of 1956, and of \$14,500,000,000 from the third quarter in 1955.

Personal consumption expenditures, reflecting the rapid and substantial rise in disposable personal income, also increased substantially and steadily throughout 1955 and through the first three quarters of 1956. In the third quarter of 1956, the Council of Economic Advisers estimated personal consumption expenditures at a seasonally adjusted annual rate of \$267,000,000,000, an increase of \$5,300,000,000 from the first quarter of 1956, and of \$15,200,000,000 from the third quarter of 1955.

Personal savings paralleled the increase in personal expenditures throughout 1955 and the first three quarters of 1956, increasing from an annual rate of \$13,900,000,000 or 5.3% of disposable personal income in the first quarter of 1955 to \$21,300,000,000 or 7.4% of disposable personal income in the third quarter of 1956.

Total personal income flow before taxes in the third quarter of 1956 was estimated by the Council of Economic Advisers at an annual rate of \$327,100,000,000, an increase in rate of \$12,500,000,000 from the fourth quarter in 1955. Personal taxes in the third quarter of 1956 were estimated at an annual rate of \$38,800,000,000, an increase in rate of \$2,500,000,000 from the fourth quarter in 1955. Thus, disposable personal income was expanded by approximately \$10,000,000,000 during this four-quarter period ending with the third quarter of 1956.

Government Expenditures.—Federal, state and local government expenditures for goods and services during the first three quarters of 1956 were slightly greater than in the corresponding quarters in 1955, due primarily to some expansion in state and local government expenditures; federal government expenditures during the first two quarters of 1956 were slightly lower than in the corresponding quarters of 1955, and in the third quarter were only slightly above the third quarter of 1955. The department of commerce estimated the annual rate of government expenditures in the third quarter of 1956 at \$80,300,000,000, of



U.S. SALES AND INVENTORIES, 1955-Aug. 1956. Source: U.S. department of commerce

nich \$47,200,000,000 represented federal government expenditures and \$33,100,000,000 represented state and local government expenditures. Of the federal government total of \$47,200,000,000, expenditures for national security accounted for \$41,700,000,000 or 88.3% of total federal expenditures. During the first three quarters of 1956, federal government expenditures for national security increased by \$1,200,000,000 while expenditures for other federal functions declined by \$400,000,000. (See also BUDGET, NATIONAL.)

Industrial Production.—Industrial production as measured by the federal reserve board index rose sharply and continuously throughout 1955 from the low point in mid 1954, and by Dec. 1955 had climbed to a new high of 144% of the 1947-49 average. During the first quarter of 1956, production declined from the December high and in March 1956 the index had dropped to 141%, a decline of 3 percentage points. There was an upturn to 143% in April, but in May and June the index fell again to 141%, and, reflecting the effects of the steel strike, dropped in July to 136%. With the settlement of the steel strike, production rebounded rapidly in August and September, and at 144% in September had regained the previous high peak reached in Dec. 1955. Although production in both the durable- and the nondurable-goods industries slackened and declined during the first two quarters of 1956, the drop was more pronounced in the durable-goods industries which also were more seriously affected by the midsummer steel strike. During the first seven months of the year ending in July 1956, the durable-goods index dropped 13 points, from 160% of the 1947-49 average to 147%. During the same seven-month period, the nondurable-goods index dropped only 6 points, from 129% of the 1947-49 average to 127%.

Employment.—Total employment dropped sharply during the first two months of 1955, and continued to drift lower during the next two months of 1956, but in March the downward trend was reversed and employment increased steadily and rapidly through August with only a slight drop in September. At the low point in February, the department of labour reported employment at 65,576,000 and unemployment at 2,914,000 or 4.4% of the civilian labour force. By August, employment had climbed to a new all-time high of 66,752,000 and unemployment had dropped to 2,195,000 or 3.2% of the civilian labour force. Because of the reduction after July in the number of persons in the civilian labour force, unemployment continued to decline through September in spite of the drop in the number employed. Unemployment in September had dropped to 1,998,000, or only 2.9% of the labour force. (See also EMPLOYMENT.)

Wages and Hours.—Average hourly earnings of production-related workers in manufacturing continued to creep upward during the fourth quarter of 1955 and throughout the first three quarters of 1956, and in Sept. 1956 were reported by the department of labour at \$2.00 per hour. The September hourly rate in the durable-goods industries was 31 cents greater than in the nondurable-goods industries, the hourly rate in the former averaging \$2.13, and in the latter, \$1.82. Hourly rates in building construction were substantially higher than in manufacturing, averaging around \$2.75 per hour during the first two quarters of the year, and in retail trade were substantially lower than in manufacturing, averaging around \$1.55 per hour during the first two quarters of the year. Average hours worked per week in manufacturing during the first three quarters of the year were down about 1 hour per week from the fourth quarter of 1955 with the durable-goods industries averaging slightly more than 40 hours per week, and the nondurable-goods industries, only more than 39 hours. Hours of work per week in building construction increased during the first three quarters of the year and the August average of 37.2 hours was an increase of 1.5 hours from the January average of 35.1 hours.

Preliminary estimates by the department of labour for August and September indicated a slight increase from previous months with average weekly earnings in September at \$81.00 per week, about 30 cents per week higher than the Dec. 1955 average. Weekly earnings in Sept. 1956 averaged \$87.54 in the durable-goods industries, an increase of \$2.64 per week from January and of \$2.88 per week from Sept. 1955. In the nondurable-goods industries, the September average was \$72.25, an increase of \$2.42 from January and of \$3.28 from Sept. 1955. Weekly earnings in building construction in Aug. 1956 averaged \$104.53, a gain of \$8.36 per week from January and of \$6.50 from Aug. 1955. Weekly earnings in retail trade in August at \$61.78 were up \$2.34 per week from January and \$1.59 from Aug. 1955. (See also WAGES AND HOURS.)

Prices.—Commodity prices at wholesale rose sharply during the first three quarters of 1956, reversing the relatively stable trend which had prevailed from Jan. 1953 until the fourth quarter of 1955. The department of labour's all-commodity wholesale price index in Sept. 1956 had advanced to 115.3% of the 1947-49 average, an increase of 3.4 points from Jan. 1956, and of 3.6 points from Sept. 1955. All components of the all-commodity index including farm products and processed foods participated in the upward trend in wholesale prices during the first five months of the year, and the June and July dip in prices was experienced by all components although in varying degrees as was also the slight upturn in September. Although the trends in the major components of the all-commodity index were in the same general direction and generally upward during the first three quarters of 1956, the disparity between the prices of farm products and processed foods and the prices of commodities other than farm products and foods which began early in 1951 and had continued for the past five years was not materially lessened. The parity ratio for farm prices, that is, the ratio of the index of prices received by farmers to the parity index based on average prices in the period 1910-14 dropped to 80 in Dec. 1955, rose gradually to 86 in June, declined to 82 in August, where it remained in September. The September parity ratio of 82 was 25 points below the average for the year 1951 when the parity ratio stood at 107.

The all-items consumer price index in August at 116.8% of the 1947-49 average was 2.2 points above Jan. 1956, and 2.3 points above Aug. 1955. The index of retail food prices in August at 113.1 was up 3.9 points from January, and the index of apparel prices at 105.5 was up 1.4 points from January. (See also PRICES.)

New Plant and Equipment.—Business expenditures on plant and equipment increased sharply throughout 1955. The July-August survey of business expenditures on plant and equipment made by the Securities and Exchange commission and the department of commerce indicated a continued increase in expenditures through the second half of 1956 of such magnitude as to raise the annual rate in the fourth quarter of the year to \$38,000,000,000 and bringing the expected total for the year 1956 to \$35,300,000,000, an increase of \$6,600,000,000 over the expenditures in 1955.

For the year 1956, manufacturing expenditures were estimated by the department of commerce at a new high total of \$15,250,000,000, an increase of \$3,810,000,000 from 1955 expenditures. The 1956 outlay for new plant and equipment in the manufacturing industries was about equally divided between the durable- and the nondurable-goods industries, the estimated total for the durable-goods industries being \$7,720,000,000, and for the nondurable-goods industries, \$7,530,000,000. Commercial expenditures for new plant and equipment in 1956 were estimated at \$10,710,000,000, an increase of \$1,240,000,000 from 1955; railroad expenditures at \$1,320,000,000, an increase of \$400,000,000;

public works and utilities expenditures at \$5,010,000,000, an increase of \$700,000,000; and mining expenditures at \$1,240,000,000, an increase of \$280,000,000.

Construction.—Expenditures for new construction reached a new high level in 1955 and were reported by the department of commerce at \$43,000,000,000 for the year, an increase of \$5,200,000,000 from 1954. During the first three quarters of 1956, construction expenditures continued to edge up gradually from the new high 1955 level, and in each of the three months of the third quarter of 1956 were at a seasonally adjusted annual rate of \$44,500,000,000, an increase in rate of \$1,500,000,000 from the 1955 level.

Private construction—residential nonfarm and business construction—continued to constitute about 70% of the total, and federal, state and local government, the remainder. In Sept. 1956, the department of commerce reported expenditures for private, nonfarm residential building at a seasonally adjusted annual rate of \$15,400,000,000, the same rate as prevailed in Jan. 1956 and in the intervening months but \$1,700,000,000 below the Sept. 1955 rate. Business expenditures in Sept. 1956 were at an annual rate of \$15,700,000,000, an increase in rate of \$1,100,000,000 from Jan. 1956, and of \$1,200,000,000 from Sept. 1955. Public construction, federal, state and local government construction, fluctuated around \$13,000,000,000 throughout the first three quarters of 1956, and at an annual rate of \$13,400,000,000 in September was \$1,000,000,000 above the 1955 rate. (See also ARCHITECTURE; BUILDING AND CONSTRUCTION INDUSTRY; HOUSING.)

Consumer Credit.—Consumer credit expanded continuously and rapidly throughout 1955 after a slight decline in January and February, and in December reached a new all-time high at \$36,-

225,000,000, an increase of \$6,100,000,000 from Dec. 1954. After a slight drop in January and February of 1956, the uptrend was resumed and continued through August when the amount outstanding was reported by the board of governors of the federal reserve system at \$37,503,000,000, an increase of \$1,904,000,000 from Jan. 1954, of \$3,867,000,000 from Aug. 1955, and of \$1,278,000,000 from Dec. 1955, the previous all-time high. Of the total consumer credit outstanding in Aug. 1956, 78% was installment credit which at \$29,427,000,000 was \$1,658,000,000 greater than in Jan. 1956, and \$3,272,000,000 greater than in Aug. 1955. Of the installment credit outstanding in Aug. 1956, 52.2% was automobile paper which at \$15,361,000,000 was \$1,047,000,000 greater than in Jan. 1956, and \$1,814,000,000 above Aug. 1955. Other consumer-goods paper, constituting about 17.5% of total installment credit outstanding, fluctuated around \$6,000,000,000 during the first eight months of 1956, and at \$6,319,000,000 in Aug. 1956 was \$557,000,000 greater than in Aug. 1955. Personal loans also increased steadily throughout the first eight months of 1956, and the amount outstanding in Aug. 1956 at \$6,052,000,000 was \$525,000,000 above Jan. 1956, and \$795,000,000 above Aug. 1955. Loans for repair and modernization fluctuated around \$1,600,000,000 during the first eight months of 1956, little changed from the 1955 average. (See also CONSUMER CREDIT; FEDERAL RESERVE SYSTEM.)

Commercial Bank Loans and Investments.—Commercial bank loans at the end of Aug. 1956 as reported by the board of governors of the federal reserve system were at a record high of \$87,600,000,000, an increase of \$5,600,000,000 from Jan. 1956, and of \$9,200,000,000 from Aug. 1955. The sharp downward trend in commercial bank investments in United States government securities which began early in 1955 was continued through

Per Cent Changes in Selected Business Indicators, United States

(Oct. 1955—Sept. 1956 From Selected Earlier Periods)

Business or economic indicator	Per cent change			Per cent change from preceding year												Per cent change		
	Oct. 1938— Sept. 1939	Oct. 1943— Sept. 1944	Oct. 1954— Sept. 1955	Jan. 1956 from Jan. 1955	Feb. 1956 from Feb. 1955	Mar. 1956 from Mar. 1955	Apr. 1956 from Apr. 1955	May 1956 from May 1955	June 1956 from June 1955	July 1956 from July 1955	Aug. 1956 from Aug. 1955	Sept. 1956 from Sept. 1955	Jan. 1956 from Jan. 1955	May 1956 from May 1955	July 1956 from July 1955	Jan. 1956 from Jan. 1955	May 1956 from May 1955	July 1956 from July 1955
General business:																		
Business activity ¹	*	+ 41.3	+ 2.9†	+ 7.1†	+ 4.0†	+ 2.6†	+ 2.0†	+ 0.3†	+ 3.8	+ 8.8	+ 2.3	+ 1.7	+ 5.2	+ 3.3	+ 11.4	+ 5.2	+ 3.3	+ 11.4
Bank deposits ²	*	+ 168.5	+ 9.2	+ 16.8	+ 8.5	+ 4.4	+ 14.7	+ 5.8	+ 5.0	+ 12.2	+ 7.5	+ 3.7	+ 6.2	+ 1.2	+ 4.4	+ 6.2	+ 1.2	+ 4.4
Commercial failures ³	- 17.9	+ 750.2	+ 12.8	+ 11.6	+ 16.8	+ 12.7	+ 9.1	+ 21.9	+ 20.9	+ 18.2	+ 24.0	+ 13.4	+ 11.1	+ 19.9	+ 8.4	+ 11.1	+ 19.9	+ 8.4
Personal income:																		
Salaries and wages	+ 390.6	+ 92.9	+ 7.8	+ 9.4	+ 8.7	+ 8.5	+ 8.2	+ 6.9	+ 7.0	+ 4.4	+ 6.4	+ 6.1	+ 4.0	+ 2.0	+ 1.7	+ 4.0	+ 2.0	+ 1.7
Total	+ 349.0	+ 96.9	+ 6.8	+ 7.9	+ 7.6	+ 7.3	+ 6.8	+ 6.1	+ 6.2	+ 4.9	+ 6.3	+ 5.6	+ 3.7	+ 1.8	+ 1.3	+ 3.7	+ 1.8	+ 1.3
Civilian nonagricultural employment ⁴	+ 62.4	+ 28.5	+ 4.0	+ 4.4	+ 4.1	+ 4.8	+ 3.8	+ 4.2	+ 4.1	+ 2.9	+ 2.6	+ 3.2	+ 2.5	+ 1.0	+ 0.5	+ 2.5	+ 1.0	+ 0.5
Unemployment ¹	- 73.6	+ 249.8	- 7.9	- 13.8	- 13.9	- 10.8	- 13.4	+ 4.8	+ 9.3	+ 14.6	- 1.9	- 7.0	- 30.7	- 23.4	- 29.5	- 30.7	- 23.4	- 29.5
Employment and earnings (mfg.):⁵																		
Number Employed	+ 66.3	+ 11.4	+ 2.6	+ 5.9	+ 4.5	+ 2.8	+ 2.3	+ 1.2	†	- 3.3	- 0.1	- 0.7	+ 0.1	+ 0.1	+ 6.0	+ 0.1	+ 0.1	+ 6.0
Payrolls	+ 460.3	+ 54.1	+ 8.1	+ 12.5	+ 9.3	+ 7.8	+ 7.9	+ 4.9	+ 4.1	+ 0.1	+ 4.2	+ 3.5	+ 3.2	+ 1.4	+ 8.7	+ 3.2	+ 1.4	+ 8.7
Per production worker:⁶																		
Weekly earnings	+ 228.9	+ 73.8	+ 5.4	+ 6.2	+ 4.6	+ 4.9	+ 5.4	+ 3.5	+ 4.0	+ 3.2	+ 4.3	+ 4.2	+ 3.1	+ 2.5	+ 2.8	+ 3.1	+ 2.5	+ 2.8
Hourly earnings	+ 204.3	+ 93.6	+ 5.2	+ 4.9	+ 4.3	+ 5.4	+ 5.4	+ 3.5	+ 5.3	+ 4.2	+ 5.3	+ 5.3	+ 3.6	+ 1.5	+ 1.6	+ 3.6	+ 1.5	+ 1.6
Hours per week	+ 9.2	- 10.2	+ 0.2	+ 1.2	+ 0.2	- 0.5	†	- 1.7	- 1.2	- 1.0	- 1.0	- 1.0	- 0.5	+ 1.0	+ 1.3	- 0.5	+ 1.0	+ 1.3
Industrial production:⁷																		
Durable goods	+ 253.6	- 2.2	+ 5.7	+ 10.3	+ 7.5	+ 5.4	+ 5.3	+ 2.6	+ 1.3	- 5.2	+ 0.6	+ 1.9	+ 1.9	+ 3.8	+ 10.9	+ 1.9	+ 3.8	+ 10.9
Nondurable goods	+ 102.5	+ 27.8	+ 4.4	+ 6.6	+ 7.4	+ 3.2	+ 2.4	+ 0.8	†	+ 0.8	+ 2.4	+ 0.8	†	+ 0.8	+ 1.6	+ 0.8	+ 0.8	+ 1.6
Total	+ 158.2	+ 11.7	+ 5.3	+ 8.3	+ 7.5	+ 4.4	+ 5.1	+ 2.2	+ 1.4	- 2.2	+ 1.4	+ 1.4	+ 0.7	+ 2.1	+ 5.5	+ 1.4	+ 0.7	+ 5.5
Value construction contracts awarded:⁸																		
Residential	+ 687.3	+ 2086.5	+ 0.3	+ 3.4	+ 7.4	+ 11.7	+ 6.9	+ 11.7	- 13.1	- 21.0	+ 4.6	+ 4.1	+ 10.0	- 32.4	+ 0.8	+ 10.0	- 32.4	+ 0.8
Nonresidential	+ 691.9	+ 900.9	+ 9.4	+ 17.1	+ 17.9	+ 16.1	+ 16.4	+ 12.9	- 5.7	- 5.1	+ 9.6	+ 9.5	+ 17.3	- 5.3	+ 8.4	+ 9.5	+ 17.3	- 5.3
Public works and utilities	+ 359.4	+ 634.3	+ 15.5	+ 101.6	+ 42.2	+ 2.4	+ 16.5	+ 18.5	+ 25.1	+ 29.4	+ 18.5	- 18.2	- 3.5	- 8.7	+ 10.7	+ 18.5	- 3.5	- 8.7
Total	+ 579.3	+ 1066.0	+ 6.7	+ 25.1	+ 17.6	+ 11.6	+ 4.3	+ 13.5	- 2.5	- 5.4	+ 9.2	- 0.5	+ 9.0	- 18.3	+ 5.8	+ 9.0	- 18.3	+ 5.8
Distribution:⁹																		
Department store sales	+ 268.0	+ 107.4	+ 5.5	+ 3.3	+ 4.4	+ 6.1	+ 2.5	+ 4.3	+ 7.8	+ 2.4	+ 7.6	+ 5.8	+ 3.2	+ 4.9	+ 0.9	+ 5.8	+ 3.2	+ 4.9
Total retail sales	*	+ 4.6	+ 4.4	+ 7.2	+ 7.9	+ 7.9	- 3.8	+ 5.1	+ 6.3	+ 0.8	+ 4.6	+ 1.6	+ 12.9	+ 3.7	+ 0.9	+ 1.6	+ 12.9	+ 3.7
Consumer credit outstanding—total ¹⁰	+ 508.4	+ 725.4	+ 16.6	+ 19.5	+ 19.2	+ 18.7	+ 17.1	+ 16.2	+ 14.7	+ 13.4	+ 12.3	+ 10.8	+ 5.9	+ 3.0	+ 1.5	+ 10.8	+ 5.9	+ 3.0
Wholesale prices:																		
Other than farm and food ⁵	+ 110.1	+ 72.5	+ 4.4	+ 4.5	+ 4.2	+ 4.7	+ 5.1	+ 5.4	+ 5.1	+ 4.2	+ 4.3	+ 3.7	+ 2.1	+ 1.0	+ 1.2	+ 4.2	+ 2.1	+ 1.0
Prices received by farmers ⁷	+ 146.9	+ 18.3	+ 3.1	+ 7.0	+ 7.0	- 6.2	- 4.5	†	+ 2.5	+ 3.4	+ 2.2	+ 0.4	+ 4.4	- 2.5	+ 3.3	+ 3.4	- 2.5	+ 3.3
Total ¹¹	+ 127.0	+ 67.9	+ 2.6	+ 1.6	+ 1.8	+ 2.5	+ 2.8	+ 4.1	+ 3.5	+ 3.2	+ 3.4	+ 3.2	+ 3.0	+ 0.8	+ 1.7	+ 3.2	+ 3.0	+ 1.7
Retail prices:																		
Food ¹²	+ 135.3	+ 64.5	- 0.2	- 1.3	- 1.8	- 1.6	- 1.4	- 0.1	+ 1.7	+ 2.4	+ 1.7	+ 1.3	+ 3.6	+ 1.9	+ 1.5	+ 1.3	+ 3.6	+ 1.9
Total cost of living ⁵	+ 94.2	+ 54.4	+ 0.9	+ 0.3	+ 0.3	+ 0.3	+ 0.6	+ 1.1	+ 1.6	+ 2.0	+ 2.0	+ 1.9	+ 2.2	+ 1.5	+ 1.0	+ 1.9	+ 2.2	+ 1.5
Prices paid by farmers ⁷	+ 118.6	+ 51.4	- 0.2	- 1.9	- 1.9	- 1.5	- 1.5	+ 0.4	+ 0.4	+ 1.5	+ 2.3	+ 2.7	+ 2.7	+ 0.8	†	+ 2.7	+ 2.7	+ 0.8
Banking items of member banks:¹³																		
Loans	+ 510.3	+ 351.0	+ 17.7	+ 18.9	+ 17.6	+ 19.2	+ 18.9	+ 18.6	+ 18.9	+ 16.2	+ 15.8	+ 15.2	+ 8.8	+ 3.3	+ 1.4	+ 15.2	+ 8.8	+ 3.3
Investments in U.S. government obligations	+ 174.8	- 27.1	- 17.9	- 19.4	- 18.6	- 16.6	- 18.7	- 19.7	- 17.6	- 19.3	- 13.0	+ 13.6	- 10.6	- 2.6	+ 0.3	+ 13.6	- 10.6	- 2.6
Total investments	+ 168.5	- 12.6	- 15.7	- 16.4	- 16.4	- 14.9	- 16.5	- 17.4	- 15.9	- 17.5	- 12.6	- 12.8	- 9.3	- 2.4	+ 0.4	- 12.8	- 9.3	- 2.4
Money in circulation	+ 344.3	+ 43.6	+ 1.5	+ 1.7	+ 1.6	+ 1.5	+ 1.7	+ 1.7	+ 1.5	+ 1.7	+ 1.1	+ 1.4	+ 0.9	+ 1.4	+ 0.7	+ 1.4	+ 0.9	+ 1.4
Foreign trade (merchandise):¹⁴																		
Exports	+ 499.9	+ 22.8	+ 17.3	+ 9.6	+ 9.8	+ 17.5	+ 19.5	+ 28.3	+ 28.0	+ 27.0	+ 22.6	+ 22.7	+ 20.4	- 9.3	- 4.3	+ 22.7	+ 20.4	- 9.3
Imports	+ 484.3	+ 225.1	+ 15.5	+ 23.3	+ 23.6	+ 8.1	+ 13.7	+ 13.6	+ 10.2	+ 18.7	+ 9.2	+ 7.0	- 5.8	- 7.2	- 3.2	+ 9.2	- 5.8	- 7.2
Corporate profits after taxes ¹⁵	*	*	*	*	*	+ 9.6	+ 9.6	+ 4.9	+ 4.9	§	§	§	§	§	§	§	§	§

*Not available. †Series lowered after May 1955 by elimination of electric power used by the Atomic Energy Commission. ‡Change less than 0.05%. § Reported quarterly. Source: ¹New York Times. ²Federal Reserve Bank. ³Dun and Bradstreet, Inc. ⁴United States Department of Commerce. ⁵United States Department of Labor. ⁶F. W. Dodge Corporation. ⁷United States Department of Agriculture.

July 1956 with some increase in such investments in August. At the low point of the decline in July 1956, commercial bank holdings of government securities as of the end of the month at \$55,900,000,000 were down \$5,000,000,000 from Jan. 1956. At the end of Aug. 1956 after a \$1,000,000,000 increase from July, commercial bank holdings of government securities were \$4,000,000,000 below Jan. 1956, and \$5,600,000,000 below Aug. 1955. Commercial bank investments in securities other than government securities remained relatively unchanged through the first eight months of 1956 at around \$16,500,000,000, substantially the same level as was maintained throughout 1955.

Sales and Inventories.—Seasonally adjusted manufacturers' sales in Aug. 1956 were reported by the department of commerce at \$27,500,000,000, a gain of \$500,000,000 from Jan. 1956 and only \$300,000,000 from Aug. 1955. Manufacturing inventories in Aug. 1956 at \$49,400,000,000 were \$3,100,000,000 above Jan. 1956, and \$5,100,000,000 above Aug. 1955.

During the first eight months of 1956 wholesale sales fluctuated from \$10,300,000,000 in January and March to \$10,700,000,000 in August when they were \$800,000,000 above Aug. 1955. Wholesale inventories were also relatively stable throughout the first eight months of 1956, fluctuating between \$12,400,000,000 in January and \$12,800,000,000 in July and August, with August inventories \$800,000,000 above Aug. 1955. Retail sales during the first eight months of the year edged up slightly from the high levels established in the last half of 1955 after minor fluctuations up and down during the first four months of the year. They declined slightly in September when they were reported by the department of commerce at \$15,900,000,000. Retail inventories after increasing sharply during the last two months of 1955 and the first two months of 1956 declined in March and leveled off through August at \$23,800,000,000.

Corporate Profits.—The department of commerce reported corporate profits after taxes at a seasonally adjusted annual rate of \$23,000,000,000 in Dec. 1955, an increase in annual rate of \$300,000,000 from the first quarter of the year. In the second quarter of 1956, the annual rate dropped to \$21,300,000,000, a drop of \$1,700,000,000 from the fourth quarter 1955 rate, but still \$1,000,000,000 greater than in the second quarter of 1955. At an annual rate of \$12,300,000,000 in the third quarter of 1956, dividend payments were \$500,000,000 above the first quarter of the year, and \$200,000,000 above Dec. 1955. Undistributed profits in the first two quarters of 1956, although below the last two quarters of 1955, were substantially the same as in the first two quarters of 1955 at around \$9,450,000,000. (V. B. B.)

Great Britain.—Unlike its predecessors in the prolonged boom, 1956 opened in Great Britain with the admission, official as well as private, that the economic position had gotten out of hand. Though the economic picture was tolerably clear, the correct remedy was politically difficult to apply. An essential aspect of the boom was that prices, and with them the cost of living, were rising. Rising prices, however, included the price of labour (wages), and moreover, they brought easy profits. Consequently the remedy calculated to arrest the rise in prices would throw on the government the odium of interfering with business, with a pay envelope and possibly with full employment.

The methods used to deal with this state of affairs were orthodox. On Feb. 16, the bank rate was raised to 5½% (the highest since Feb. 1932) and the following day Harold Macmillan, the chancellor of the exchequer, introduced a miscellaneous commandment dose of supporting remedies including a reduction in public expenditure, notably in the nationalized industries and food subsidies, and a reduction in the investment allowance in industry. These interim measures were followed by the budget, which recognized that further taxation as a deflationary instrument was out of the question. Its chief interest lay in a novelty,

the introduction of so-called "premium bonds" which were meant to stimulate savings by introducing an element of gambling in place of fixed interest. This measure was adopted in the face of fairly wide-spread criticism. The various devices introduced up to this point satisfied the government that it would be possible to keep prices steady for a year.

They were reinforced by a number of subsidiary savings in government expenditure announced on June 26, amounting to £76,000,000 in the year.

The difficulties of dealing with the problem of rising prices accompanied by a high domestic level of consumption, to the detriment of exports, and of capital formation, were illustrated about the middle of 1956 when the credit squeeze, coupled with restrictions on the purchase of cars and with internal readjustments, led to the dismissal of a number of employees in the motor industry. The largest single number was 6,000 men dismissed by the British Motor corporation. Strong feelings were aroused among the trade unions, and it looked as though a new situation had arisen. The natural outcome of government policy would have been to create a moderate pool of unemployed, having the dual purpose of reducing claims for higher wages and of facilitating the transfer of labour to areas where it would be most useful economically.

It now looked as though full employment would have to be maintained and the transfer of labour arranged through a more direct form of intervention.

On the whole, however, these different measures worked; the more effectively since the restrictions on instalment purchasing and the increases in purchase tax introduced in 1955 began to make themselves felt. The over-all result, which must have been expected by the authorities, was to place a brake on industrial production, which showed a tendency to level off instead of rising as it had done in previous years. But this average result concealed substantial differences in different industries. Production of radio and television sets and of electrical equipment, as well as of cars, fell substantially, whereas the production of steel expanded still further. The increase in the demand for machine tools was a good indication of the rate at which industry was re-equipping itself. This picture was confirmed by financial statistics. Deposits and advances at the clearing banks were lower, at least in the first six months of 1956. In other words, the brake was being effective and beginning to hold business back. The relevant figures for the bank clearing and for consumption seemed to indicate a relaxation in the spending spree and in the chase of money after goods. The resultant saving was reflected in a better balance of payments.

Until the Anglo-French intervention in Egypt in November the general economy was in a state of balance, albeit a precarious one. The immediate expenditure on these operations was not sufficient to cause a major disturbance in the budget: the chancellor of the exchequer stated that the extra expenditure until the end of the financial year would amount to no more than £50,000,000. The rest of the world passed its judgment by heavy withdrawals, with the result that the gold and dollar reserves were under severe pressure. Some people professed to believe that this strain would be no more than temporary. The first effect of the intervention in Egypt was a pronounced shortage of oil. This was mainly due to the fact that a given tonnage of shipping was required to carry oil over substantially larger distances than hitherto. But the question of finding dollars to pay for U.S. oil also rose, and in this respect it was noted with some alarm that the position of Great Britain was strikingly inferior to that, for example, of the German Federal Republic.

(See also BANKING; CENSUS DATA, U.S.; INTERNATIONAL TRADE; LAW; STOCKS AND BONDS; TARIFFS; TAXATION.)

(W. H. JN.)

Butler, Paul Mulholland (1905-), U.S. political leader who as chairman of the Democratic national committee managed the campaign of the Democratic party in 1956, was born at South Bend, Ind., on June 15 and took his law degree from Notre Dame university in 1927. Even before setting up practice in his native town in 1927 he had entered politics as a Democratic precinct worker. He rose gradually in the ranks of Indiana politics, becoming national committeeman for the state in 1952. At the Democratic convention of 1952 in Chicago, Ill., Butler was one of Adlai E. Stevenson's principal supporters for the presidential nomination, and the following year he was named to the 11-member executive committee of the Democratic national committee. Butler was elected chairman of the national committee on Dec. 4, 1954, despite the opposition of former President Harry S. Truman, and he took office on Jan. 1, 1955. Almost immediately he began to attack the Eisenhower administration, concentrating on Vice-Pres. Richard M. Nixon, whom he accused of "smear tactics" during the 1952 and 1954 election campaigns. During 1956 Butler repeatedly criticized Pres. Dwight D. Eisenhower's decision to run for a second term despite his heart attack, declaring on one occasion that the president's re-election would mean "government by a shadowy regency acting in the president's name." Following the Democratic convention at Chicago in 1956 the Democratic national committee on Aug. 18 re-elected Butler chairman, after brief opposition from Adlai E. Stevenson.

Butter: see DAIRY PRODUCTS; VEGETABLE OILS AND ANIMAL FATS.

Byrd, Richard Evelyn (1888-), U.S. explorer and naval officer, was born at Winchester, Va., on Oct. 25. He was graduated from the U.S. naval academy at Annapolis, Md., in 1912, subsequently advancing to the rank of rear admiral, retired. An early naval pilot (1918), he was in command of U.S. naval air bases in Canada during the latter part of World War I. In 1925 he led the naval section of the Navy-MacMillan polar expedition. On May 9, 1926, he was co-pilot with Floyd Bennett on the first flight by man over the north pole. (Later, with three crewmen, he was first to fly over the south pole Nov. 29, 1929.)

On June 29-July 1, 1927, with three others, Byrd flew the Atlantic eastward from New York city. The plane was forced down near Ver-sur-Mer, Fr., after failure to land in Paris because of bad weather.

Byrd's greatest fame came as leader of a series of expeditions to the antarctic, in 1928-30, 1933-35, 1939-41 and 1946-47. During the first he established the Little America camp in the Ross sea. In the second he nearly lost his life when he wintered alone at a weather base for five months. The third expedition resulted in the most extensive exploration of the antarctic to that date. The fourth, in addition to gathering important scientific data, was undertaken to train military personnel for combat in polar regions. More than 1,000,000 sq.mi. of new territory were mapped during the four expeditions. (See also *Encyclopædia Britannica*.)

Byrd's fifth trip to the antarctic was announced in 1955. On March 28 he was appointed commander of an expedition to leave later that year as part of the United States participation in events of the International Geophysical year, 1957-58. The first section of the expedition sailed from Boston on Oct. 30, 1955. On Nov. 2 it was announced that Byrd had been placed in charge of the entire United States antarctic program. He left for the antarctic later that month, reaching Kainan bay, about 800 mi. from the south pole and near the Bay of Whales, on Dec. 28 and setting up the expedition's principal base there.

Cacao: see COCOA.

Cadmium: see MINERAL AND METAL PRODUCTION AND PRICES

Calendar of Events, 1956: see pages 65-80.

California. Ranked second nationally in both area and population, California gained statehood on Sept. 9, 1850. Popularly called the "Golden state" because of the association of gold with its early development, California contains a total area of 158,693 sq.mi., including 1,953 sq.mi. of water area. It is the most southerly of the Pacific coast states. The July 1, 1956, population estimate of the state indicated 13,433,000 inhabitants (1950 census, 10,586,223). Chief cities (pop. 1956 estimate with 1950 figures in parentheses) were Los Angeles, 2,104,663 (1,970,358); San Francisco, 805,000 (775,357); San Diego, 466,000 (334,387); Oakland, 404,500 (384,575); Long Beach, 316,000 (250,767); Sacramento (the state capital), 158,747 (137,572); Fresno, 118,000 (91,669); Berkeley, 115,000 (113,805); Glendale, 114,753 (95,702); San Jose, 112,465 (95,280); Pasadena, 110,475 (104,577); Burbank, 96,890 (78,577).

History.—After charges and countercharges between Gov. Goodwin J. Knight and Treasurer Charles G. Johnson, and with the conduct of the treasurer's office under legislative investigation, Johnson retired during 1956. Governor Knight appointed A. Ronald Button to fill the unexpired term of Johnson, who had been in office since 1922. The other state officers remained: Harold J. Powers, lieutenant governor; Frank M. Jordan, secretary of state; Edmund G. (Pat) Brown, attorney general; Robert C. Kirkwood, controller; Roy E. Simpson, superintendent of public instruction.

Following the national pattern, California gave its electorally vote to Pres. Dwight D. Eisenhower in the 1956 elections. Locally the Democratic party again whittled away at the long-standing Republican supremacy in the state legislature to a point of equality in the state senate and near equality in the assembly. Three major bond issues passed by substantial majorities. The first provided for a \$500,000,000 extension of the California veterans' farm and home purchase program. The second measure, a \$100,000,000 issue, provided for school building and site purchases, and for facilities for educating physically handicapped and mentally retarded minors. The third bond issue, \$200,000,000, was to be used in the state building construction program with a minimum of \$60,000,000 designated for state colleges. The most heated local issue proved to be an abortive oil and gas conservation measure, with several million dollars being expended by both proponents and opponents of the measure.

The Christmas floods of 1955 proved to be the most disastrous in California's history. The inundation was widespread, including much of the Central valley and many of the coastal valleys, and cut north-south transportation arteries, bringing holiday travel to a standstill. Particularly hard hit was the Yuba City area, where the combined waters of the Feather and Yuba rivers broke the levee and caused considerable loss of life and property damage in the amount of approximately \$200,000,000. The winter floods combined with the perennial summer shortage of water gave additional impetus to demands for action on the \$1,500,000,000 Feather river project.

San Francisco bay's last automobile ferry ceased operation upon the opening of the double-decked Richmond-San Rafael bridge. Built at a cost of \$68,000,000, it was the world's second longest high-level crossing, reaching a length of 21,343 ft.

California played host to the Republican national convention which was held in the Cow Palace and brought 40,000 visitors to San Francisco. At approximately the same time San Francisco's famous Ferry building, after modernization, was opened as a world trade centre, providing offices for firms engaged in foreign trade and 60,000 sq.ft. of display space for foreign merchandises.



SMOKE PALL hanging over the hills in San Bernardino valley, Calif., on Sept. 24, 1956, the fifth day of an extensive forest fire. Thousands evacuated their homes as the blaze threatened the Lake Arrowhead resort area

Continued population growth in California magnified the inadequacy of school facilities and the teacher shortage. Subdivisions for residential purposes and acquisition of lands for highway development caused continued loss of productive agricultural land.

Education.—Average daily school attendance for budgetary purposes for 1954-55 was calculated at 1,738,531 for elementary school districts, at 125,197 for high school districts and at 117,376 for junior college districts.

Social Insurance and Assistance, Public Welfare and Related Programs.—As of June 1956 there were 264,276 recipients of old-age security payments, with average monthly aid being \$71.28 per person (June 1955, \$69.190 at \$67.60 per recipient). Aid to the needy blind program paid 15,547 persons average payments of \$88.37. Support was provided for 180,305 needy children with average monthly payments of \$47.26 to children in family groups, while general home relief was provided for 25,717 cases involving 44,856 persons.

For the month of Aug. 1956 the four California-administered social insurance programs compensated 76,868 unemployed or disabled claimants per week in a total amount of \$11,050,862 for the month. Total operating expenses for the state department of corrections for the year 1955-56 were estimated at \$24,336,247. Total population of California correctional institutions as of July 31, 1956, numbered 15,250, including 604 women. Estimates of youth authority institutions totalled 3,498 (as of July 31, 1956), of which 411 were in two schools for girls, 267 in three forestry camps for boys, 1,489 in four schools for boys and 667 in vocational institution; the remainder were in other institutions or prisons.

Communications.—Final automobile registrations for 1955 were 5,360,717. Estimated total expenditures by the state division of highways for reconditioning, resurfacing and construction of highways for 1955-56 were estimated at \$275,086,273, including \$44,015,074 in federal aid contributions (1954-55, \$251,075,534, including \$30,396,808 in federal assistance).

Figures compiled in 1950 indicated 7,518 mi. of steam and 702 mi. of electric railroads in California. As of Dec. 31, 1954, the state had 465 airports, including 205 public and 260 limited airports, with 8,367 planes based in California airports. As of 1955 there were 4,979,840 telephone stations within the state.

Banking and Finance.—Total assets of the 148 state-licensed savings and loan associations operating in California (as of Dec. 31, 1955) were \$1,185,162,847, while 66 federal savings and loan associations had assets of \$1,956,410,201 and total bank debits reached \$147,002,673,000. As of April 10, 1956, California's 89 federal reserve member banks had total assets of \$19,070,571,000.

Estimated total state revenue for 1955-56 was \$1,562,264,381 (1954-55, \$1,433,824,048), and estimated total expenditures were \$1,606,163,971 (1954-55, \$1,422,451,674). California's net bonded debt (outstanding Dec. 31, 1955) was \$785,355,680. Per capita income for 1955 was \$2,271 and per capita tax rate \$111.74, while state tax collections in 1955 amounted to \$1,480,010,000 (1954, \$1,299,714,000).

Agriculture.—California's gross cash farm income again led the nation in 1955, being \$2,632,650,000 (1954, \$2,518,384,000). Returns from livestock and poultry products aggregated \$951,373,000 (1954, \$904,810,000), and crop returns were \$1,681,277,000 (1954, \$1,613,574,000).

Manufacturing.—As of July 1956, 1,156,600 wage and salary workers are employed in California manufacturing industries. Approximately 11,200 were employed in production of nondurable goods and 765,400 in manufacture of durable goods. As of Aug. 1956 total civilian employment was 5,512,000, highest in state history, while unemployment figures showed 134,000 not working.

Preliminary estimates of 1955 retail trade indicated \$17,636,900,000 spent, marking an increase of 14.7% from the preceding year's total. Public and private construction figures were estimated at 16.7% higher than in 1954, or \$4,900,000,000.

(D. C. Cr.)

Mineral Production.—Table III shows the tonnage and value of minerals produced in California whose value exceeded \$100,000 in 1953 and 1954. In 1954 the state led all others in output of asphalt, borates, chromite, diatomite, pumice, sand and gravel, produced 61% of total mercury and a great part of iodine, was second in production of bromine, crude petroleum, potash and tungsten and in output of cement, but first in shipments of cement, third in china clay and fourth in output of gold and natural gas. The state ranked second in value of its minerals, with 10.25% of the U.S. total in 1954.

Table I.—Leading Agricultural Products of California

Crop	Indicated 1956	1955	Average, 1945-54
Cotton, bales	1,330,000	1,205,000	1,164,000
Hay, tons	6,828,000	6,652,000	5,952,000
Potatoes, bu.	27,352,000	29,189,000	25,434,000
Oranges, boxes	38,000,000	39,140,000	44,479,000
Lemons, boxes	13,000,000	14,000,000	13,001,000
Barley, bu.	69,844,000	68,925,000	52,677,000
Wheat, bu.	8,442,000	8,883,000	11,319,000
Corn, bu.	14,472,000	16,170,000	3,219,000
Beans, bags (100 lb.)	3,684,000	4,109,000	4,148,000
Rice, bags (100 lb.)	10,296,000	11,186,000	9,442,000
Sugar beets, short tons	3,506,000	3,365,000	2,901,000
Hops, lb.	7,155,000	8,112,000	13,473,000
Apples, bu.	8,360,000	9,440,000	8,514,000
Peaches, bu.	39,378,000	34,002,000	32,423,000
Pears, bu.	17,585,000	14,459,000	14,014,000
Grapes, tons	2,741,000	3,016,000	2,722,200
Apricots, tons	182,000	253,000	193,100
Prunes, tons	180,000	131,000	175,900
Plums, tons	100,000	86,000	78,400
Walnuts, tons	71,000	72,000	65,190
Almonds, tons	48,000	38,300	39,330

Source: California Crop and Livestock Reporting Service and U.S. Department of Agriculture.

Table II.—Principal Industries of California

	All employees 1954	Salaries and wages 1954 (in 000s)	Value added by manufacture 1954 (in 000s)	Value added by manufacture 1953 (in 000s)
Food and kindred products	145,287	\$599,006	\$1,401,677	\$1,158,766
Apparel and related products	55,794	166,244	271,034	286,952
Lumber and products (except furniture)	57,019	246,331	423,035	433,976
Furniture and fixtures	22,420	90,847	153,468	150,385
Paper and allied products	20,695	89,165	183,059	175,475
Printing and publishing industries	52,119	249,496	414,921	390,790
Petroleum and coal products	20,184	105,615	267,377	265,566
Stone, clay and glass products	33,798	142,815	300,421	301,323
Primary metal industries	38,883	179,359	353,221	391,851
Fabricated metal products	73,314	333,261	586,558	605,312
Machinery (except electrical)	67,802	325,435	578,739	610,919
Electrical machinery	47,192	209,589	384,982	449,064
Transportation equipment	271,392	1,372,545	2,257,038	1,964,976
Miscellaneous manufactures	45,770	196,651	340,991	259,267

Source: U.S. Department of Commerce, 1954 Census of Manufactures, preliminary report.

Table III.—Mineral Production of California
(In short tons, except as noted)

Mineral	1953		1954†	
	Quantity	Value	Quantity	Value
Total		\$1,393,963,000		\$1,429,710,000‡
Boron minerals	715,000	17,668,000		26,714,000
Cement (bbl.)	32,002,000	90,873,000	32,762,000	98,251,000
Chromite	27,000	2,078,000	31,000	2,285,000
Clays	2,430,000	4,953,000	2,723,000	6,038,000
Coke*	749,000	2	628,000	2
Copper	382	219,000	362	214,000
Gold (oz.)	235,000	8,211,000	238,000	8,326,000
Gypsum	1,199,000	2,856,000	1,162,000	2,804,000
Iron ore	1,901,000	1	1,423,000	1
Iron, pig*	1,085,000	1	872,000	1
Lead	9,000	2,270,000	3,000	732,000
Lime	301,000	4,653,000	212,000	3,388,000
Magnesium compounds	56,000	3,483,000	41,000	2,716,000
Mercury (flasks, 76 lb.)	9,000	1,793,000	11,000	2,978,000
Natural gas (000 cu. ft.)	531,346,000	104,675,000	507,289,000	104,502,000
Natural gasoline (000 gal.)	910,350	85,691,000	923,000	89,293,000
Perlite	15,000	113,000	15,000	103,000
Petroleum (bbl.)	365,085,000	909,060,000	355,865,000	907,466,000
Petroleum gases (000 gal.)	397,572	21,961,000	396,000	22,262,000
Pumice and pumicite	433,000	648,000	567,000	652,000
Salt	1,123,000	6,263,000	1,186,000	6,126,000
Sand and gravel	58,430,000	53,224,000	70,525,000	68,139,000
Silver (oz.)	1,036,000	938,000	310,000	280,000
Stone	14,497,000	18,473,000	23,304,000	37,541,000
Talc	126,000	1,133,000	133,000	1,211,000
Tungsten concentrate 60% WO ₃	2,000	8,939,000	4,000	13,209,000
Zinc	5,000	1,232,000	1,000	306,000
Other minerals . . . . .	...	42,556,000	...	42,328,000

*Values for processed materials are not included in the totals.

†Value included with other minerals.

‡Preliminary.

§Total has been adjusted to eliminate duplication in the value of clays and stone.

Source: U.S. Bureau of Mines.

ENCYCLOPÆDIA BRITANNICA FILMS.—*California* (1955); *Far Western States* (1955); *Yosemite* (1954).

Cambodia. An independent kingdom situated in the southern part of the Indochinese peninsula, on both banks of the Mekong river, Cambodia is bounded west and north by Thailand, northeast by Laos, east and southeast by the National Republic of Vietnam and southwest by the Gulf of Siam. Area: 67,568 sq.mi. Pop. (1955 est.): 4,358,000. The Cambodians (87% of the total) are Thai-speaking Khmers. National minorities: Vietnamese and Chinese. Religion: Buddhist. Capital (pop., 1955 est.): Pnom-Penh 375,000. Ruler, King Norodom Suramarit; premiers during 1956, Norodom Sihanouk (to April 2 and from August until Oct. 15), Khim Tit (April 2 to July 29) and San Yun (from Oct. 25).

History.—The formal coronation of King Norodom Suramarit took place on March 5, 1956. His son, the former king, Norodom Sihanouk, resigned from his position as prime minister to travel abroad affirming Cambodian neutrality. The countries he visited



CORONATION of King Suramarit and Queen Kossamak of Cambodia on March 5, 1956, at Pnom-Penh, the nation's capital

from April through July included the Philippines, Communist China, Poland, France and the U.S.S.R.

Khim Tit, prime minister from April 2, resigned with his cabinet on July 29, and Sihanouk resumed the position temporarily. The national assembly approved San Yun as prime minister on Oct. 25.

On Dec. 15, 1955, Cambodia became a member of the United Nations. South Vietnam closed its border with Cambodia during March 1956, after a dispute over islands in the Gulf of Siam. On April 12 a trade agreement was concluded with Communist China, and on May 17, the U.S.S.R. recognized and exchanged ambassadors with the Cambodian government.

The French were building a harbour on the Gulf of Siam, at Kompong Som, to provide Cambodia with its own free port. Khmer was made the one official language of the country and religious instruction in Buddhism was made compulsory in the schools. (Hu. De.)

Education.—Schools (1955): primary 2,671, pupils 324,929; secondary (including teachers' training schools) 12; technical 2; institutions of higher education 4.

Currency.—Monetary unit: riel = 10 metropolitan French francs. U.S. \$1 = 350 metropolitan francs.

Cameroons: see NIGERIA; TRUST TERRITORIES.

Cameroun: see FRENCH EQUATORIAL AFRICA; FRENCH UNION.

Camp Fire Girls: see SOCIETIES AND ASSOCIATIONS, U.S.

Canada. A member of the Commonwealth of Nations, Canada is a federal union covering all of North America north of the United States except Alaska. Area: 3,845,774 sq.mi. Capital: Ottawa (*q.v.*). Governor general, Vincent Massey (*q.v.*); prime minister, Louis Stephen St. Laurent (*q.v.*). Pop.: (1951 census) 14,009,429; (June 1, 1955, official est.) 15,601,000.

Table I.—Largest Cities of Canada

City	(Population, 1951 Census)		City	Population
	Population			
Montreal, Que.	1,021,520		Edmonton, Alta.	159,631
Toronto, Ont.	675,754		Calgary, Alta.	129,060
Vancouver, B. C.	344,833		Windsor, Ont.	120,049
Winnipeg, Man.	235,710		London, Ont.	95,343
Hamilton, Ont.	208,321		Halifax, N. S.	85,589
Ottawa, Ont.	202,045		Verdun, Que.	77,391
Quebec, Que.	164,016		Regina, Sask.	71,319

Table II.—Area and Population of Canada

Provinces and territories	Total area	(Population, 1951 Census)		June 1, 1955 estimate
		1951 census	Density per square mile	
Alberta	255,285	939,501	3.7	1,066,000
British Columbia	366,255	1,165,210	3.2	1,305,000
Manitoba	246,512	776,541	3.2	849,000
New Brunswick	27,985	515,697	18.4	558,000
Newfoundland and Labrador	155,364	361,416	2.3	412,000
Nova Scotia	21,068	642,584	30.5	683,000
Ontario	412,582	4,597,542	11.1	5,183,000
Prince Edward Island	2,184	98,429	45.1	108,000
Quebec	594,860	4,055,681	6.8	4,520,000
Saskatchewan	251,700	831,728	3.3	889,000
Northwest Territories	1,304,903	16,004	.01	18,000
Yukon Territory	207,076	9,096	.04	10,000
Total Canada	3,845,774	14,009,429	3.6	15,601,000

History.—Canada in 1956 enjoyed a continuation of the upward trend in business, trade, employment and general material prosperity which had been well established in 1955, after the mild recession of 1954. The gross national product reached an annual rate of \$30,000,000,000, as against just under \$27,000,000,000 in 1955. Even so, planned capital investment was somewhat curbed by the physical limits of available manpower and materials. The latter were massively supplemented by merchandise imports from the United States. Rising prices, credit expansion and an unusually large unfavourable balance in international trade caused some uneasiness, and the Bank of Canada took a number of steps aiming at a mild tightening of monetary policy.

The heightened business activity extended from coast to coast; it was especially marked in Ontario and Quebec, and in British



TRANS-CANADA PIPELINE, a section completed in 1956, which would eventually bring natural gas from Alberta to eastern markets, a distance of 2,200 mi.

Columbia and Alberta. Capital projects of especial magnitude included those connected with the St. Lawrence seaway, which, at the half-way mark, entered on a period of rising tempo. Others included the huge uranium development in the Blind river area of Ontario, the first stages of the trans-Canada gas pipeline which by 1958 was expected to be the longest in the world, bringing natural gas from Alberta to central Canada, the continued search for gas and oil in the prairie provinces and the start on the 650-mi. gas pipeline from the Peace river district to Vancouver, B.C., and the U.S. border.

In June the Pacific Great Eastern railway's extension from Squamish to Vancouver was officially opened; this line was being extended to link the west coast with central and northern Alberta. Construction permits reached their highest levels in history during the year. House building continued at a high level. In September sod was turned for the first commercial atomic energy plant in Canada, situated on the Ottawa river west of the national capital. Another very large harvest of wheat was gathered in, and while wheat exports rose to high levels, stocks were still burdensome and created problems in storage and financing.

The national budget was brought down on March 20. The minister of finance, Walter Harris, had forecast a deficit of \$160,000,000, but buoyant business conditions reduced this to \$52,000,000. Tax cuts were unimportant. A surplus of \$113,000,000 was forecast for 1956-57, and indications before the end of the year were that this would be materially exceeded. Of total expenditures of \$4,440,000,000, about 40% was for national defence, North Atlantic Treaty organization (NATO), etc. The finance minister proposed a 20% tax on advertising revenues of Canadian editions of U.S. magazines to begin Jan. 1, 1957. Some Canadian publishers defended this as protection against unfair competition, but it was widely criticized in the press of Canada as ineffective and discriminatory.

Early in the year a trade delegation from the U.S.S.R. visited Ottawa, Ont., and negotiated a trade treaty for a three-year period. Included in its provisions was a contract for Soviet purchases of Canadian wheat.

Domestic politics were unusually active. No less than six of the ten provinces held general elections to choose a legislature and government for the next four years. The general trend in these was to re-establish the existing party even more solidly in power. In the national sphere, the Progressive Conservative leader, George Drew, was compelled to resign because of ill health, and a national convention was summoned to choose a successor.

A bitter and prolonged debate occurred in the house of commons over the propriety of a large government loan to a private company building the trans-Canada gas pipeline from Alberta.

The fact that the promoters were mainly U.S. oilmen figured in the dispute. One segment of the house fought strenuously for government ownership and operation of the entire line. Scenes of turmoil and all-night sittings of the house developed when the government applied "closure" to get the bill through by the date stipulated in the contract with the private company. The speaker of the house was accused of intolerable partisanship in his handling of the debate, and attempts were made to bring about his resignation. In the end the government was sustained by its substantial majority, but there was widespread criticism of its methods even from the normally friendly press across Canada.

In April the Canadian Congress of Labour and the Trades and Labour congress (Canada's two largest unions) were merged into one body under the title, the Canadian Labour congress. The Canadian and Catholic Confederation of Labour, centred in Quebec, constituting the largest body still outside, met and agreed in principal to affiliation with the Canadian Labour congress, final ratification being postponed until their convention of June 1957.

There was renewed pressure on the federal government to implement the recommendation of the Massey commission of 1951 for the creation of a Canada council to foster and finance a more active cultural life across the nation. A Royal Commission on Broadcasting held sessions in various parts of Canada during the spring and the autumn seeking a solution for the thorny problem of financing Canada's blend of state and private radio and television broadcasts. The extension of a microwave network from eastern Canada to Winnipeg, Man., as part of a program to reach from the Atlantic to the Pacific added considerably to the area of "live" television for simultaneous broadcast; by 1958 this was planned to cover all of Canada.

The current high rate of natural increase and the substantial immigration since 1945 confronted Canadian educators with a problem of finding facilities and teaching staffs for the rising school and college populations. Municipalities appealed to provincial governments for relief, and the national government was urged to take a far more dramatic part in this expansion. Early in October Prime Minister Louis St. Laurent announced that he was prepared to recommend substantially increased national grants to colleges and universities, provided a method could be worked out which did not seem to threaten provincial autonomy.

(See also articles on individual provinces and territories; also ACCIDENTS; CANALS AND INLAND WATERWAYS; CONSUMER CREDIT; EDUCATION; ELECTRICAL INDUSTRIES; FOREIGN INVEST-

MENTS; FORESTS; HORSE RACING; HOUSING; INDUSTRIAL HEALTH; INTERNATIONAL TRADE; LABOUR UNIONS; MOTION PICTURES; MUNICIPAL GOVERNMENT, NEWSPAPERS AND MAGAZINES; POST OFFICE; PUBLIC UTILITIES; RIVERS AND HARBOURS; SOCIAL SECURITY; STRIKES; THEATRE; WILDLIFE CONSERVATION.)

(Wd. E.)

Education.—In the school year 1952-53 there were 30,731 provincially controlled elementary and secondary schools with 98,125 teachers and 2,666,216 pupils; evening classes had 223,493 pupils. Other provincially controlled schools included 13 schools for the blind and deaf with 310 teachers and 2,054 pupils and 117 normal schools with 1,257 teachers and 10,216 pupils. The 1,169 private elementary and secondary schools had 7,830 teachers and 167,042 pupils. Indian schools numbered 456 with 842 teachers and 25,949 pupils. There were 262 universities and colleges with 10,878 teachers, total enrolment of 106,386 and full-time university grade enrolment of 60,879.

Finance.—The monetary unit is the Canadian dollar, with a par value of U.S. \$0.909 since Sept. 30, 1949. Under the exchange system introduced Sept. 30, 1951, all exchange transactions for U.S. dollars were conducted on a free market in which the value of the Canadian dollar ranged in the first 9 months of 1956 between a low of U.S. \$1.00031 (Feb. 17) and a high of \$1.02656 (Sept. 14). The federal budget for the fiscal year ending March 31, 1957, estimated revenue at \$4,775,000,000 and expenditure at \$4,650,000,000; actual revenue in 1955-56 (preliminary) was \$4,385,400,000, expenditure \$4,437,100,000. The net federal debt on March 31, 1956 (preliminary) was \$11,314,800,000 (1955: \$11,263,100,000). The direct and indirect debt (less sinking funds) of provincial governments was \$3,967,576,000 on March 31, 1955. Currency in circulation on June 30, 1956, totalled \$1,604,000,000; demand deposits, \$4,236,000,000. The U.S. department of commerce estimated U.S. direct private investments in Canada in 1955 at U.S. \$6,464,000,000, of which \$2,834,000,000 represented manufacturing investments and \$1,329,000,000 petroleum investments. National income in 1955 was estimated at \$20,900,000,000. The cost-of-living index stood at 103 in July 1956 (1953=100).

Trade.—Exports in 1955 were valued at \$4,281,784,253 (1954: \$3,881,271,854); re-exports, \$69,499,483 (\$65,644,868); imports, \$4,711,713,197 (\$4,093,196,338). In the first six months of 1956 exports were valued at \$2,270,100,000 (1954: \$2,031,900,000); re-exports, \$34,100,000 (\$31,400,000); imports, \$2,845,300,000 (\$2,209,400,000). In 1955, Canada's principal customers were the U.S. (60%), the U.K. (18%), Japan (2.1%), western Germany (2.1%) and Australia (1.4%). Leading suppliers were the U.S. (73%), the U.K. (8.5%), Venezuela (3.9%), western Germany (1.2%) and Japan (0.8%). Leading exports were newsprint (16%), planks and boards (9.0%), wheat (7.9%), wood pulp (6.9%) and nickel (5.0%). Leading import groups were iron and steel and manufactures (34%), non-metallic minerals and products (except chemicals) (14%, of which petroleum and products accounted for 8%), agricultural and vegetable products (except chemicals, fibres and wood) (12%), nonferrous metals and products (8.6%) and fibres, textiles and textile products (8.1%).

Transport and Communications.—The combined length of railway track in operation on Dec. 31, 1954, was 58,760 mi.; mainline track totalled 43,130 mi. Passengers carried in 1955 totalled 27,000,000 (1954: 28,396,528); freight, 179,776,000 short tons (155,747,000 tons). On Dec. 31, 1955, the merchant marine had 2,596 vessels (100 tons and over) aggregating 2,079,322 gross tons and 14,592 vessels (under 100 tons) aggregating 237,074 tons. In 1955, 34,874,198 short tons of freight were carried through Canada's 11 canals, including 20,893,572 tons through the Welland canal. Canadian airlines carried 2,711,352 revenue passengers and 222,224,900 lb. of revenue freight in 1955. Highway mileage (Dec. 31, 1954) totalled 524,055; surfaced mileage was 192,616. At the end of 1955 motor vehicle registration totalled 3,948,787, including 2,935,412 passenger cars.

On Dec. 31, 1954, Canada had 3,860,269 telephones or 25 per 100 population. In Sept. 1955 there were 179 standard broadcast-band stations, 10 short-wave stations, 31 frequency-modulation stations and 31 television stations and at the end of 1955 more than 1,900,000 television sets.

Agriculture and Fisheries.—Total cash farm income in 1955 (preliminary)



GREAT SEAL of Canada, redesigned in 1956. The seal is affixed to all official documents

9,670,796 pelts were taken, valued at \$30,509,515, of which fur farms accounted for 43%.

Table III.—Principal Field Crops of Canada, 1955 and 1956

Crop	Acres		Bushels	
	1955	1956	1955	1956*
Wheat	21,505,800	21,340,400	494,116,000	512,250,000
Oats for grain	11,178,000	11,972,500	403,835,000	514,657,000
Barley	9,932,500	8,722,300	252,225,000	281,639,000
Rye	780,200	557,000	14,744,000	8,698,000
Mixed grains	1,705,200	1,634,700	65,353,000	66,976,000
Potatoes	308,300	303,100	63,302,000	60,886,000
Flaxseed	1,838,400	3,141,000	19,748,000	37,299,000
Tame hay	11,055,000	11,206,000	19,869,000†	19,390,000†

*Preliminary forecast, August 15, 1956.

†Short tons.

Source: Dominion Bureau of Statistics.

Manufacturing.—In 1954 Canada had 38,028 industrial establishments employing 1,267,966 persons who earned \$3,896,687,691; value added by manufacture was \$7,902,124,137 and selling value of factory shipments totalled \$17,554,527,504. Table IV shows the principal statistics of the ten leading manufacturing industries in 1954. Production in 1955 included steel ingots and castings 4,529,401 short tons, pig iron 3,213,764 tons, ferro-alloys 166,682 tons, aluminum ingots 584,153 tons, cement 25,184,050 bbl., passenger cars 375,127, commercial vehicles 79,249. Production of sawn timber was estimated at 7,916,120,000 bd.ft., wood pulp at 10,145,733 short tons and newsprint at 6,190,647 tons. Installed electric energy capacity on Dec. 31, 1955, was 13,905,000 kw.; production (1955) totalled 76,296,630,000 kw. hr.

Table IV.—Leading Manufacturing Industries of Canada in 1954

Industry	Estab-lish-ments (number)	Em-ployees (num-ber)	Salaries and wages (in 000)	Value added by manufacture (in 000)	Value of factory shipments (in 000)
Pulp and paper	125	60,837	\$252,598	\$641,410	\$1,241,558
Nonferrous metal smelting and refining	22	26,048	102,596	352,038	922,579
Petroleum products	61	12,476	52,316	309,795	909,253
Slaughtering and meatpacking	154	22,999	78,699	157,684	837,508
Motor vehicles	20	27,949	106,062	176,473	666,287
Sawmills	7,696	57,010	139,572	263,629	572,186
Butter and cheese	1,467	20,599	55,022	99,404	412,205
Primary iron and steel	51	28,861	108,817	217,487	383,154
Aircraft and parts	47	35,095	135,863	181,382	343,011
Miscellaneous food preparations	333	10,131	28,462	90,418	306,451

Source: Dominion Bureau of Statistics.

Minerals.—Mineral production was valued at \$1,778,398,272 (preliminary) in 1955 (1954: \$1,488,382,091). Table V shows the production and value of leading minerals in 1954 and 1955. The length of oil pipelines was 5,079 mi. on Dec. 31, 1955, and in 1955 the flow of oil, including

Table V.—Leading Minerals of Canada, 1954 and 1955

Mineral, unit	1954		1955*	
	Quantity	Value	Quantity	Value
Petroleum, crude, bbl.	96,080,345	\$243,877,080	128,811,000	\$303,561,000
Copper, lb.	605,464,042	175,712,693	649,207,453	239,394,952
Nickel, lb.	322,557,961	180,173,392	349,161,430	216,433,694
Gold, troy oz.	4,366,440	148,764,611	4,556,400	157,305,152
Zinc, lb.	752,982,353	90,207,285	853,931,313	116,425,122
Iron ore, short ton	7,361,598	49,666,507	17,377,252	113,385,503
Asbestos, short ton	924,116	86,409,212	1,055,266	98,690,514
Coal, short ton	14,913,579	96,600,266	14,578,821	92,227,211
Lead, lb.	436,990,488	58,250,831	387,948,053	55,786,929
Silver, troy oz.	31,117,949	25,907,870	27,901,427	24,625,797

*Preliminary estimate, April 1956.

Source: Dominion Bureau of Statistics.

deliveries of foreign crude petroleum and products, was 224,274,768 bbl. Natural gas production totalled 143,699,000,000 cu.ft. in 1955.

(J. W. Mf.w.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Industrial Provinces of Canada* (1943); *Manitoba* (1955); *Maritime Provinces of Canada* (1943); *Pacific Canada* (1943); *Prairie Provinces of Canada* (1943); *Prince Edward Island* (1955).



GOV. GEN. VINCENT MASSEY of Canada opening parliament at Ottawa, Ont., Jan. 10, 1956

Canadian Literature. Fiction.—The quality of fiction writing by Canadian authors in 1956 was high. Of the half dozen or so beginning novelists, three achieved immediate note with their books. Gladys Taylor's *Pine Roots* was a fine story about pioneering in the Swan river valley, Manitoba; Adele Wiseman's *The Sacrifice* was a moving account of Jewish life in Winnipeg; Charles Israel's *How Many Angels* was a gentle but penetrating study of war's aftermath on courageous yet sensitive personalities. Veteran novelists who returned with notable books were Earle Birney, *Down the Long Table*, Vera Lysenko, *Westerly Wild*, Ethel Wilson, *Love and Salt Water*, and Mary Douglas, *Take Thy World*.

Poetry.—A reassuring feature of the year was the number of Ryerson press poetry chapbooks issued. Eight poets were provided with a forum which at once encouraged them and gratified poetry lovers. The year's addition of chapbooks brought the total to nearly 170, issued over three decades. The main contribution of the Ryerson chapbooks, however, was that they created a great plain of Canadian verse out of which could (and did) arise from time to time peaks of poetry. In 1956 those peaks took the form of Wilfred Watson's *Friday's Child* (1955), a collection that was at once novel and exciting; Irving Layton's *The Improved Binoculars*, marked by both deftness and passion; and Anne Wilkinson's *The Hangman Ties the Holly* (1955), laden with imaginative and debonair paradoxes.

Nonfiction.—The distinguishing characteristic of the nonfiction of 1956 was the great number of works that fell into the categories of places and people. Regional books were, indeed, outstanding in content as well as in number, and they ranged far and wide over the nation. Robert Legget's *Rideau Waterway* (1955) was the best treatment to date of the historic Rideau Canal across eastern Ontario; Dorothy Dumbrille's *Braggart in My Step* recorded more memories of Ontario's Glengarry county; Basile Robert's *Noranda* was a fragment, dramatic and important, of Canadian mineral development. Larger areas were featured by other books. Paul King and Raymond de Coccia covered the Arctic in *Ayorama* (1955), a study of Eskimo land, where realism and fatalism govern life; Will R. Bird, veteran novelist, travelled off-Trail in *Nova Scotia*, his native province; and Miriam Chapin explored the role and examined the future of *Atlantic Canada*.

People occupied as many authors as places, and most of the studies were satisfying. Especially so were Fred C. Hamill's vivid recapturing of Col. Thomas Talbot, eccentric bachelor of upper Canada fame, in *Lake Erie Baron*; William Kilbourn's cleverly human evocation of William Lyon Mackenzie in *The Firebrand*; and Jessie L. Beattie's loving and delicate study of Hamilton's great Christian Negro, *John Christie Holland*. More scholarly, though not less readable, was John A. B. McLeish's *September Gale*, a study of Arthur Lismer, the artist. More acid, and perhaps therefore less trustworthy, was H. B. Ferns and Ostry's *The Age of Mackenzie King*, the statesman. More worrisome and quite fitting to its subject, James G. Gardiner, the politician, was Nathaniel A. Benson's *None of It Came Easy*. More artless, but not uninforming, was Hilda M. Ridley's *The Story of L. M. Montgomery*, the author. The spate of autobiographies which poured from the presses in 1956 was unusual. Humorist Robert Thomas Allen reported his misadventures in *The Grass Is Never Greener*; Wanda Tolboom recaptured her experiences as an *Arctic Bride*; radio commentator Kate Aitkin relived childhood in *Never a Day So Bright*; Lady Flora Eaton ransacked her past as a retail store merchant in *Memory's Wall*; Charles Comfort related his experiences as an *Artist at War*; Walter S. Woods reascended the ladder to his post of deputy minister of veterans affairs in *The Men Who Came Back*; archaeologist C. T. Currelly dug up his own past in *I Brought Home the*

Ages.

Among other titles of note, the best were Edgar Collard's *Canadian Yesterdays*; Roy M. Wiles's *Serial Publication in England Before 1750*; Edwin C. Guillet's *Pioneer Inns and Taverns*; D. M. Le Bourdais's *Canada's Century* (1955); Bruce Hutchison's *The Struggle for the Border* (1955); Rae Chittick's *Health for Canadians*; Marius Barbeau's *The Tree of Dreams* (French-Canadian folklore); and Thelma Boucher's *One Gardener to Another*.

Juvenile.—It was interesting that a number of the novels for younger readers were written by authors who were already recognized in the adult field. These included Richard S. Lambert with *Redcoat Sailor* (Sir Howard Douglas, builder of Nova Scotia); Josephine Phelan with *The Bold Heart* (Father LaCombe, the prairie missionary); and Roderick Haig-Brown with *Captain of the Discovery* (George Vancouver, the explorer). These three novels hewed closely to the facts of the lives on which they were based, and were part of a series labelled "Great Stories of Canada." Another author of adult books who turned his talents to the juvenile field was Farley Mowat with *Lost in the Barrens*, which was clearly based on his personal adventures in the dangerous Arctic meadows. But that was only part of the 1956 upsurge of juvenile writing. Other teen-age novels included Pamela Stephen's *Winged Canoes at Nootka* (pioneering in British Columbia); D. R. King's *Sukanabi* (fur trading among Alberta Indians); Douglas Spettigue's *The Friendly Force* (the Royal Canadian Mounted Police); Margaret Govan's *The Trail of the Broken Snowshoe* (winter adventure in the Muskokas); Anne MacMillan's *Levko* (racial problems on the prairies); Eva-Lis Wuorio's *The Canadian Twins* (trans-Canada travel); Dickson Reynolds's *Perilous Prairie* (homesteading in Saskatchewan); and J. W. Chalmer's *Red River Adventure* (the Selkirk settlers).

The production of books for preteen readers was one of the most hopeful signs for Canadian juvenile writing. The best of the novels in the new field were *At the Dark of the Moon* (based on Indian lore) by Mabel Tinkiss Good; *A Dog for Davie's Hill* (sheepherding in Scotland) by Clare Bice; and *Judy and the General* (4-H clubbing) by Lyn Cook. The best of nonfiction were *Glooskap's Country* (Indian legends) by Cyrus Macmillan; *The Long Hike* (a recaptured childhood incident) by Dorothy Ivens; and *The Song of Lambert* (a fantasy of a singing lamb) by Mazo de la Roche of "Jalna" fame. (C. Cy.)

French.—The outstanding book of 1956 was *Rue Deschambault*, a collection of autobiographical sketches by Gabrielle Roy, the author of *The Tin Flute* and *The Cashier*. This is a more intimate book, portraying members of her family and friends in a small rural community in Manitoba. This is Gabrielle Roy at her best. The other outstanding books of the year were *La guerre de la conquête* by Guy Frégault, a new book on the Seven Years' War seen from the French-Canadian point of view; *Psychanalyses d'hier et d'aujourd'hui*, by Henri Gratton, a scholarly study of psychoanalysis; and *La Grève de l'Amiante*, a collection of studies of the various aspects, social, economic, political, legal and religious, of the famous asbestos strike.

Many chapbooks of poetry appeared during the year, including *Du centre de l'eau* by J. P. Filion; *Laves et neiges* by G. Cartier; *Larmes* by R. Savard; *Ces Anges de sang* by F. Ouellette; and *Les Cloîtres de l'été* by J. G. Pilon. One thing all of these poets of the younger generation had in common was a basic contempt for traditional ideas and a toilsome effort to create new forms.

No novel of any significance came out in the course of the year. J. Filiatrault's *Chaines* was a diptych opposing two short stories, and the other works in the field of creative writing that deserve a mention were two short comedies, *La Fontaine de Paris* by Eloi de Grandmont and *Le Dodu* by J. Ferron.

A useful book was A. Drolet's *Bibliographie du roman canadien-français* which covers the period 1900-50. (See also LITERARY PRIZES.) (G. SR.)

Canals and Inland Waterways. Inland and intra-coastal waterways which had been improved by the U.S. army corps of engineers, on behalf of the federal government, had in 1956 a total length of more than 28,000 mi. Much of this length, however, represented shallow-draught channels improved many years before, which were no longer of material importance to commercial navigation. About 80% of modern water-borne commerce is carried on 12 waterways with an aggregate length of 5,800 mi. These include such waterways as the Gulf Intracoastal waterway and the lower Mississippi river with its extension up the Ohio to the Pittsburgh area and up the Illinois river to the Great Lakes system at Chicago.

The connecting channels of the Great Lakes link the busiest and most important inland waterway system in the United States and perhaps in the world. This value would be greatly augmented by the 27-ft. St. Lawrence seaway, which was under construction during the year, and the deepening of the connecting channels.

The corps of engineers, in addition to its responsibilities for development and maintenance of the nation's navigable waterways and harbour channels, is charged with compilation and publication of the statistics on water-borne commerce. In Oct. 1956 the corps announced that in the calendar year 1955 the volume of freight carried on U.S. inland waterways reached a new all-time high. In round numbers this volume was 216,500,000,000 ton-mi., compared with 173,700,000,000 ton-mi. in 1954 and 202,400,000,000 in 1953, the previous record year. In the table is shown a breakdown of the ton-mile total for calendar year 1955:

System	Ton-miles
Great Lakes system	118,800,000,000
Mississippi river system	52,000,000,000
Atlantic coast waterways	27,000,000,000
Gulf coast waterways	14,000,000,000
Pacific coast waterways	4,700,000,000
Other waterways	4,500,000
Total	216,504,500,000

Water-borne commerce of the United States generally, which includes coastal harbours and rivers as well as inland waterways, exceeded 1,000,000,000 tons for the first time in history in the calendar year 1955. The total was 1,016,000,000 tons, compared with 867,600,000 tons in 1954 and 924,100,000 tons in 1951, the previous record year.

Appropriations for fiscal year 1957 carried the sum of \$5,000,000 for the initiation of work on deepening the connecting channels of the Great Lakes to 27 ft. from the existing 21 ft. Another appropriation was \$6,000,000 to deepen the Delaware river to 35 ft. between Philadelphia and Trenton from the existing 25- and 28-ft. depths. A third significant appropriation was \$7,700,000 to continue construction of a control plan designed to prevent the capture of the lower Mississippi river by the Atchafalaya river. The amount of \$8,500,000 was appropriated for continuing work on improvement of the Calumet-Sag channel in Illinois to provide more adequate channel dimensions and bridge clearances in that important link between the Mississippi river system and the Great Lakes. Another important appropriation was \$4,500,000 for continuing work on the Plaquemine-Morgan City alternate route, Gulf Intracoastal waterway. Substantial appropriations also were made for modernization of locks and dams on the Ohio river and on the Tombigbee-Warrior waterway.

Funds provided for planning work on various navigation projects in fiscal year 1957 were featured by an amount of \$325,000 for the initiation of planning on the Mississippi river Gulf outlet. This project would provide an additional outlet to the Gulf of

Mexico from the New Orleans area. It would be a shorter route than the existing river route and one that would not be subject to large fluctuations in the stages of the river. The improvement providing a tidewater outlet, had an estimated federal cost of \$88,000,000. (E. C. I.)

Canada.—The Canso canal was scheduled to be in full operation to accommodate 30-ft.-draught vessels with the opening of spring navigation in 1957. It was opened for 10-ft.-draught vessels in Sept. 1955 and later for 12-ft. and 17-ft. vessels. The canal is the navigation lock through the causeway built across the Strait of Canso, which separates Cape Breton Island from the mainland of Nova Scotia.

Total freight transported through all Canadian canals in 1955 amounted to 34,874,198 tons, an increase of almost 16% over the previous year. The transport of iron ore more than doubled. The year 1955 was the first complete season for shipments of Labrador ore. The general increase in freight was accompanied by a 11% rise in the number of vessel passages, from 25,292 in 1954 to 28,172 in 1955. More pleasure craft were using Canada's canals in 1955 than in 1954, a total of 57,605 against 54,031.

By late 1956 construction of the St. Lawrence seaway, which would increase the minimum depth of navigational waters from Montreal to the head of the Great Lakes from 14 ft. to 27 ft., was approximately at mid-point. Begun in 1954, the work was to be completed for the opening of the navigation season of 1959. The St. Lawrence Seaway authority, a crown-owned corporation, had already awarded contracts to a value of more than \$160,000,000 of the \$215,000,000 which would be Canada's share for construction of the navigation facilities.

At Iroquois lock, most westerly of the seven new locks which would replace 21 locks of the old St. Lawrence system, the 3,000-ft. upstream approach wall was virtually complete and the entrance to the lock chamber was being built. The St. Lawrence Seaway authority was building this and four of the other six locks. The downstream approach wall and one side of the St. Lambert lock were scheduled for completion during 1956, and the Côte Ste. Catherine lock structure was making rapid progress, while the two Beauharnois locks were still in the excavation stage.

More than 15,000 men were directly employed on the entire St. Lawrence Seaway and Power project, including 6,000 in Canada and the United States working on the new navigational facilities and 9,000 in both countries in the construction of the power project. (W. H. V. A.)

Great Britain.—The eighth annual report of the British Transport commission was submitted to the minister of transport and civil aviation on June 25, 1956. Total traffic carried on the nationalized waterways in 1955 was 10,477,000 tons, which was 425,000 tons, or 4.2% more than in 1954 (after making adjustments for certain reclassifications). A dock strike in May and June 1955 adversely affected the volume of traffic. The large, single proportionate increase was in the carriage of imported petroleum products and fuel oil. The deficit for 1955 on waterways owing was £176,000 or £85,000 more than in 1954. Gross receipts rose by 3% largely because of increased charges, but expenses increased by 6%. The commission carried in its own craft only about one-fifth of the traffic on its canals and its carrying operations in 1955 resulted in a deficit of £99,000, as against £80,000 in 1954.

A development plan at a total estimated cost of £5,500,000 was approved in principle by the commission toward the end of the year. This plan budgeted for improvements on seven major waterways, including bank protection, lock widening projects, the provision of new plants for dredging and other purposes and improvements of premises. These schemes were expected to be carried out over the next few years as economic conditions permitted.

Belgium.—A national plan was agreed upon for the improvement of seven principal waterways to permit the passage of vessels carrying up to 1,350 tons. Work was begun on the Charleroi-Brussels canal and its principal branch from Seneffe to Louvière; Nimy-Péronnes canal; on the Sambre between Monceau and Namur; on the Meuse between Liège and the French frontier; on the circular canal around Ghent; on the Haut-Escaut; and on the Central canal. To finance these works a 10-year credit was approved of B.fr. 11,000,000,000.

German Federal Republic.—Further progress was made on the Dortmund-Ems enlargement scheme to create navigable conditions for 1,000-ton ships. Work continued in the middle part of the Weser on the scheme for seven barrages between Minden and Bremen, and three barrages were completed for about DM. 30-40,000,000 each. Plans were also made to construct an additional 18 barrages to improve navigation up to Hannoversch-Münden, and it was decided to canalize the Neckar for a length of 24 km. up to Stuttgart. On the main waterway of Rhine-Main-Donau (Danube), the Donau was made navigable up to Regensburg, as part of a general improvement of the waterway between Schweinfurt and Bamberg. It was decided to carry the improvement along the Main up to Bamberg by 1960, and later to build 39 barrages between Bamberg and Regensburg. Freight traffic on the inland waterways of the republic was 124,600,000 tons in 1955, as against 109,400,000 in 1945, an increase of 13.9%.

(See also ELECTRICAL INDUSTRIES; IRRIGATION; RIVERS AND HARBOURS.)

(A. H. J. B.)

ENCYCLOPEDIA BRITANNICA FILMS.—*The Great Lakes—How They Were Formed* (1951); *The Great Lakes—Highway of Commerce* (1951); *The Great Lakes—Their Link With Ocean Shipping* (1951); *Inland Waterways* (1956).

Canary Islands: see SPAIN.

Cancer. The term cancer is applied to all malignant tumours, and this includes sarcomas—cancers arising in connective tissues (bone, tendon, muscle, etc.)—as well as the much more numerous cancers originating in the skin, the tissues lining the digestive and respiratory systems and the glandular structures. Malignant diseases involving the blood-forming tissues—leukemia, Hodgkin's disease and lymphosarcoma—are regarded as closely related to cancer.

Statistical Trends.—During 1956 in the United States cancer deaths numbered 250,000, a rate of 150 per 100,000. Although the crude death rate showed an increase over the figure for the previous year, the age-standardized death rates for most types of cancer continued to decline or to show no significant change. Cancer of the lung continued to increase, the burden of which was borne largely by males. The favourable trends noted for cancer in general among women resulted largely from improved curability of cancer of the uterus, to which the nation-wide program of public education and improved detection methods contributed.

Financial Support.—The national anticancer program of the American Cancer society was supported by voluntary contributions amounting to \$27,150,000, of which 28%, or \$7,602,000, was allocated for support of fundamental and clinical research and for the training of young investigators and physicians.

The federal government appropriated \$48,432,000 for the government program of research and control, of which \$32,896,000 was in support of laboratory and clinical investigations. Contributions to the Damon Runyon fund, exclusively allocated to research support, totalled approximately \$1,000,000.

Education.—Education of the public stressed the early signs and symptoms of cancer, the importance of early diagnosis and the value of periodic physical examinations. Opinion surveys disclosed that those who know most about cancer have the most

realistic and least fearful attitudes toward it, while those who know least about it are, in general, the most fearful.

Facilities.—The American College of Surgeons reported the existence of 579 approved cancer consultative (diagnostic) and treatment clinics and 123 approved cancer consultative clinics. Eleven approved cancer hospitals were listed. Many new radioactive cobalt irradiators were installed, and research was being carried on in laboratories and hospitals in more than 215 institutions, many of them associated with universities.

Advances.—Further experience with the vaginal cytologic method of diagnosis (smear diagnosis) confirmed its value in disclosing cancer of the uterus, often in a very early stage when the rate of cure is as high as 80%. It became increasingly apparent that wide application of the test could sharply reduce deaths from uterine cancer, the leading cause of cancer deaths among women. Further study of cells in the vaginal secretions suggested a means of determining the best way of treating cancer of the neck of the womb—by surgery or by irradiation—in individual cases. Since the nucleus appears to control cell division, a characteristic feature of cancer, much research interest remained focused on the chemical processes of the cancer cell, especially on how the nuclear substance is formed.

Numerous investigations of the chemical make-up of tobacco and its combustion products were undertaken, and it was reported that fractionation of condensed cigarette smoke had yielded a substance which, when applied to the skin of mice, would cause cancer in a high proportion of them. Additional clinical studies seemed to establish more firmly a relationship between cigarette smoking and lung cancer, but medical opinion differed widely on the significance of this association. Increasing attention was given to air pollution, notably products of combustion, as a possible cause of lung cancer.

The usefulness of carefully planned and selected ultraradical operations for extensive cancer became more firmly established, although some investigators expressed interest in more conservative surgical treatment for cases of early cancer of the breast and thyroid. An extended operation for cancer of the breast was reported as yielding a 10% higher cure rate than the type of operation usually employed.

In other clinical studies, the pituitary gland, located at the base of the brain, was removed in order to eliminate all possible sources of growth-stimulating hormones as a means of controlling rampant cancer of the breast and prostate. Some investigators held that improvement followed in about half the cases, while others were less enthusiastic. Clinical investigation also continued to employ adrenalectomy (removal of the adrenal glands) in an effort to halt the progress of advanced breast cancer. The results of these surgical procedures would be determined after exhaustive follow-up studies.

The question of immunity to cancer was studied in one striking experiment in which 14 healthy volunteers from the Ohio state penitentiary had living cancer cells placed beneath the skin. In no instance did the cancer survive. However, when similar experiments were made in patients who had advanced cancer, 21 of 23 attempts to implant the disease were described as successful. These studies were done in an attempt to show that cancer cells behave like bacterial cells and that some chemotherapeutic agent may be discovered to control the disease.

Developments in the drug treatment of cancer revealed that 14 chemical compounds, four types of hormones and five radioactive isotopes were, with varying success, restraining the course of leukemia, Hodgkin's disease, lymphosarcoma, multiple myeloma, polycythemia and cancer of the lung, ovary, thyroid, breast and prostate. While the results were unpredictable and usually temporary, they represented an epochal advance, the more remarkable for having been achieved in the space of 15

years.

(See also BLOOD, DISEASES OF THE; SURGERY; X-RAY AND RADIOLOGY.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Cancer* (1953).

Candy. More than 1,500 wholesale confectionery manufacturers and almost 2,000 retail confectionery manufacturers in the United States sold more than 3,000,000,000 lb. of candy with a wholesale value at the manufacturers' sales level of \$1,200,000,000 in 1956. Both in poundage and in dollar value this set an all-time record for the industry. These figures compare with sales of 2,724,000,000 lb. of candy with a value of \$1,031,000,000 during 1955.

During 1956 almost 100,000 persons were employed in candy production and an almost equal number in the sale and distribution of candy. More than 2,000,000 confectionery outlets in the United States sold confectionery products, ranging from the supermarket to the small retail candy stand.

A major development in 1956 was the levelling off of cocoa bean prices at an average of about 28 cents per pound, compared with an average price of 35 cents to 40 cents the year before. This resulted in greater use of chocolate in candy and, in turn, resulted in increased sales of confectionery products.

Candy consumption in the United States increased to 17 lb. per person over 16.6 lb. in 1955 and 16.5 lb. in 1954. The all-time high of 20 lb. per person was attained in 1944.

Major developments in the year were: (1) the continued increase in importation of confectionery products from abroad, especially from England; (2) the greater use of automatic equipment on the production line; (3) expansion of the road-side type of candy operation; (4) greater interest in research and product development, with special emphasis on the use of whey and other agricultural products in the production of candy; (5) a sharp increase in the sale of dime bars; (6) an apparent end of the liquidation of smaller manufacturers (which was very much in evidence during the five preceding years); and (7) the production of European-style candies (hitherto imported) by U.S. manufacturers on a franchise basis.

Bar goods sales advanced. Five-cent bars comprised 65% of all bar goods sold in 1956, compared with 67% in 1955 and 70% in 1954.

Imports of sugar candy and confectionery into the United States increased to 30,000,000 lb., with a value of \$10,000,000 in 1956, compared with 25,368,000 lb. valued at \$8,836,000 in 1955. The United Kingdom accounted for 70% of all candy imports; Austria was second with 5% and the Netherlands was third with 4%. Exports of candy and chocolate from the United States continued to be negligible.

(D. Gw.)

Cane Sugar: see SUGAR.

Canning Industry. The United States and territorial pack of canned fruits, vegetables, juices, specialties, milk, meat and fish was approximately 630,000,000 cases during the 1955-56 season, according to the National Canners association. This quantity was 21,000,000 cases more than the 1954 pack and the second highest on record. Five of the seven groups of canned foods, fruits, vegetables, milk, meat and specialties, showed increases in production in 1955 compared with 1954. Only canned juices and canned fish declined in production. The pack of various canned foods from 1939 through 1955 is shown in Table I.

The quantity of poultry used in canning and other processed foods during 1955 reached an all-time high, 1½% above the previous high in 1954. The rise continued during the first eight months of 1956 when the quantity of poultry canned was 12%

more than during the same period in 1955.

The 1,093,000,000 lb. of fish canned in 1955 by U.S. canner was approximately 25% of the total catch of all fish. In 1955 85% of all the salmon caught was canned, 90% of the sardine and 99% of the tuna. The 11 major vegetables produced for processing in the U.S. in 1955 had a farm value of more than \$250,000,000. The farm value of the fruits canned in the U.S. in 1955 exceeded \$140,000,000.

Data published by the U.S. department of agriculture indicated that about 20% of the 1955 U.S. production of all fruits was canned and nearly 50% of the 1955 acreage of all vegetables was processed.

Exports of canned foods from the U.S. in 1955 continued to increase over previous postwar years according to the U.S. department of commerce. Total volume of all canned foods exported from the U.S. in 1955 totalled 903,000,000 lb. and had a value of \$138,000,000. The 1955 tonnage of U.S. canned foods exported was 14% higher than during 1954 and the value was 18% above 1954. Canned meats, milk, fish and specialties represented a slightly larger proportion of the total canned food exports than during recent years. Canned fruits, vegetables and juices accounted for 69% of all U.S. canned food exports in 1955 compared with 72% in 1954. Canned food exports during the first 6 months of 1956 were 20% greater than exports during the same period in 1955.

Canada continued to be the most important foreign market for U.S. canned food exports in 1955, taking 28% of the U.S. exports of canned fruits, 32% of the canned vegetables and 56% of the canned juices.

The 219,000,000 lb. of canned fruits exported from the U.S. in 1955 was the highest since 1947. Canned pineapple, fruit cocktail and peaches continued to be the three major canned fruit items exported from the U.S., accounting for 76% of the total 1955 canned fruit exports.

Tomato juice was the major canned vegetable product exported in 1955, accounting for 23% of all canned vegetable exports. For

Table I.—Production of Various Canned Foods in the U.S.

(In 000,000 of standard cases)									
Year	Fruits	Juices	Vegetables	Specialties*	Milk	Fish	Meat†	Total	
1939	52	43	108	74	51	19	9	356	
1940	49	55	133	79	58	19	12	405	
1941	62	59	163	92	77	23	20	496	
1942	59	73	194	54	83	18	43	524	
1943	47	79	179	53	73	17	46	494	
1944	57	95	170	69	82	18	43	534	
1945	52	111	177	83	90	19	43	575	
1946	83	105	201	102	74	21	30	616	
1947	68	98	166	104	77	22	24	559	
1948	66	94	158	111	81	24	24	558	
1949	71	91	164	112	66	26	23	553	
1950	77	109	166	113	68	30	27	590	
1951	83	104	209	118	67	25	33	639	
1952	77	109	194	120	66	26	30	622	
1953	80	114	189	127	60	26	32	628	
1954	83	99	183	125	59	28	32	609	
1955‡	92	93	196	130	60	26	33	630	

*Includes baby food, soup, baked beans (with and without tomato sauce), spaghetti, hominy, mushrooms, Chinese foods and other specialties. †Excluding Meat Soups. ‡Preliminary Source: National Canners Association, Washington, D.C.

Table II.—Apparent Annual Civilian per Capita Consumption* of Various Canned Foods, U.S.

(In lb.)							
Year	Fruits	Juices	Vegetables	Soups	Baby Foods†	Fish	Meat
1946	21.9	22.6	41.0	8.7	2.8	3.8	7.9
1947	17.9	19.2	36.1	8.7	2.8	3.6	7.1
1948	17.8	21.4	33.1	9.6	3.5	3.8	7.7
1949	18.5	19.7	33.8	9.6	3.3	4.1	7.1
1950	21.0	18.6	36.6	10.2	3.4	4.3	8.4
1951	18.7	18.8	36.6	10.5	3.4	4.0	8.8
1952	20.6	18.7	35.8	11.2	3.6	4.1	9.3
1953	19.6	19.1	36.4	11.5	3.9	4.2	9.8
1954	19.2	18.4	36.0	12.0	4.0	4.2	9.6
1955‡	21.8	17.9	37.0	12.0	4.0	3.6	10.1

*Derived by U.S. Department of Agriculture from data on production and utilization from the annual supply of each food (production plus carry-over stocks plus imports are deducted exports, government purchases and carry-over stocks. The residual is considered to be civilian consumption. This is divided by estimated population to determine per capita consumption.

†Estimated on the basis of total population, rather than on the population of babies.

‡Preliminary.

Source: U.S. Department of Agriculture, Agricultural Marketing Service.

canned vegetables as a group, 1955 exports were about 10% above the 1954 exports, and the highest since 1947. Citrus juices accounted in 1955 for nearly 66% of the total exports of canned fruit juices.

The total per capita consumption of canned foods of all kinds in the U.S. during 1955 was about 132 lb.—a slight increase over the previous year. The per capita consumption of the selected groups of canned foods during the 10 years 1946–55 is shown in Table II.

According to the bureau of labour statistics prices of canned fruits and vegetables were quite stable during 1955, averaging 104% of the 1947–49 average compared with 110.9% for all foods. During the first eight months of 1956 retail prices of canned fruits and vegetables increased on the average about 3%, to 107.5% of the 1947–49 average. The average wholesale price index for canned fruits and vegetables during the first eight months of 1956 was 111% of the 1947–49 average for canned fruits and 108.9% for canned vegetables.

Continued progress was made during 1955 in the research investigating the effect of possible application of radiation sterilization to canned foods processing. Additional knowledge was gained concerning the effects of irradiation on nutritive values, taste and odour of canned products.

The development of new canned products proceeded at an accelerated rate in 1955. A number of completely new products were developed and marketed successfully during the year, as well as new combinations of existing products. Especially noticeable were the canned juices that were introduced and marketed for the first time in 1955.

(H. L. SR.)

Cape Verde Islands: see PORTUGUESE OVERSEAS TERRITORIES.

Carnegie Trusts: see SOCIETIES AND ASSOCIATIONS, U.S.

Carnivals: see SHOWS.

Caroline Islands: see MARSHALL, CAROLINE AND MARIANA ISLANDS.

Cartography. **International.**—The 18th International Geographical congress, of the ninth general assembly of the International Geographical Union, was held in Rio de Janeiro, Braz., Aug. 9–18, 1956. Two of the four new International Geographical Union commissions included population mapping and national atlases. In the extensive map exhibit was a noteworthy display of U.S.S.R. maps and atlases. The 20th International Geologic conference was held in Mexico City, Mex., Sept. 4–11, 1956. Outstanding recent maps were displayed by France, Mexico and the U.S.S.R., among other exhibits.

The first report of the working group on the *World Climatic Atlas*, sponsored by the World Meteorological organization and containing specifications for preparing the atlas, was published in Jan. 1956. The U.S. portion of this atlas was to consist of approximately 157 maps at 1:10,000 scale to be completed by 1960.

Western Hemisphere.—The sixth edition of the *Status of Topographic Mapping* was published by the U.S. geological survey at 1:5,000 scale and also at 1:10,000 scale as a sheet of the *National Atlas of the United States*. The geological survey reported that about 1,800 new topographic sheets per year were being produced. A new series of state base maps at 1:500,000 scale was completed for Oregon, Pennsylvania and New York. Maps for the areas of 20 major cities were published at 1:24,000 scale (Washington, D.C. at 1:31,680). The survey printed a list of available aerial photographs illustrating specific physiographic features corresponding to "A Set of One Hundred Topographic Maps."

The orthophotoscope, a device for changing conventional aerial

photographs with their distortions into the equivalent of distortion-free photographs was developed by the survey.

The U.S. army map service reported new processes using rub-on coating for colour printing and brush-graining of zinc and aluminum plates. The bureau of the census published "Census Atlas Maps of Latin America, Central America" at 1:4,000 scale. The U.S. coast and geodetic survey published the *Gulf Coast Gazetteer* and had another in progress for the east coast. The American Geographical society compiled two map series on Antarctica: 4 sheets at 1:3,000 scale, in monochrome, and a dichrome sheet at 1:6,000. The society also completed two of the three sheets at 1:5,000 on Africa. The *National Geographic* magazine produced an excellent 1:3,000-scale map on Alaska. Advance compilations of 12 coastal sheets at 1:20,000 scale were completed of the Kuskokwim bay and river area of Alaska.

In Canada, the University of British Columbia was preparing an atlas of British Columbia. A group of researchers at McGill university was completing a five-year aerial survey of Labrador-Ungava forests with the compilation of 1:1,000-scale maps. The geographic branch, department of mines and technical surveys, published *Canadian Maps 1949–1956*, no. 16 in the "Bibliographic Series." Work continued on the *National Atlas of Canada*. "Britannia Sør," a 1:50,000-scale map of northeast Dronning Louise Land, Greenland, was compiled from aerial photographs by the directorate of colonial surveys and published by the (British) Royal Geographical society.

Cuba and adjacent islands were photographed at about 1:60,000 scale for developmental purposes. A geological map of Mexico at 1:2,000 scale was published. The Geographic Institute of Costa Rica published an initial 13 sheets of a 1:25,000-scale series planned for the entire country. Census atlases were published by Costa Rica and El Salvador and 25 pages of maps and graphs were completed for the "Census of Agriculture of Honduras." A provisional geological sketch map of northern French Guiana was published in three sheets at 1:200,000 scale. Bolivia reported completion of four arcs of first-order triangulation: one extending east and west from Santa Cruz and tied to the Brazilian and Chilean triangulation systems; one from Santa Cruz westward to the Peruvian border; and two parallel arcs extending from La Paz and Santa Cruz southward to the Argentine border. Preliminary work continued in the La Paz area for 8 sheets at 1:25,000 scale. The Military Geographic Institute of Chile announced publication to date of 370 maps at 1:25,000 scale; 18 polychrome sheets at 1:100,000 scale; a preliminary shaded relief map of the country at 1:250,000 scale, and complete coverage at 1:500,000 scale. A folder entitled "Graphic Chile," containing six economic, industrial and agricultural maps at 1:3,000 scale was in preparation. A Spanish-American dictionary of technical geographical terms and a 3-volume geographical dictionary of Chile were prepared.

Europe.—The ordnance survey of the United Kingdom reported that the major and secondary triangulations begun in 1935 were substantially completed. Status reports indicated that the 1:1,250-scale series was 52% completed; the 1:2,500-scale series was nearly 6% completed; the 1:10,680-scale provisional series was 13% completed; and the 1:25,000-scale series was completed for Great Britain except the highlands of Scotland. Volume iv of the *Times Atlas of the World* covering southern Europe and part of Africa was published. An ordnance survey map of Roman Britain at 1:1,000 scale, with text, was published. The Norwegian bureau of statistics published a 16-sheet population map series at 1:400,000 scale covering the country.

A unique cartographic conference, sponsored by Esselte A.B., was held in the Stockholm (Swed.) suburb of Tollare July 26 to Aug. 2, 1956. Delegates from 10 foreign countries discussed map-finishing and reproduction problems. Plates 41–42, 75–76

and 79-80 of the *Atlas of Sweden* were completed. In *Globen*, vol. xxxv, no. 2 (1956) was a comprehensive review of the official Swedish program for long-term mapping, besides a description of the new Swedish 1:250,000-scale map series. The Geographical Society of Finland started work on a new atlas of Finland. The Geographical Institute of Poland published a new geological atlas of the country in five sheets at 1:2,000 scale. Belgium reported publication of 24 maps of the *Atlas of Belgium*. A new Austrian atlas of Salzburg province was published. A forest atlas of Czechoslovakia containing 120 maps was completed, and work was begun on a new geological series at 1:200,000 scale. Initial sheets of the Italian land-use survey on Calabria were completed at 1:200,000 scale.

An Oxford regional economic atlas, *The U.S.S.R. and Eastern Europe*, was published. The U.S.S.R. produced administrative maps ranging in scale from 1:600,000 to 1:1,500,000 of Astrakhan, Moscow, Leningrad, Kalinin and Sakhalin *oblasts*; Atlati and Krasnodar *krais*; Daghestan A.S.S.R., Marii A.S.S.R. and Kazakh S.S.R. The Soviets also produced a physical map of the U.S.S.R. at 1:4,000 scale and administrative maps of the U.S.S.R. at 1:4,000, 1:5,000 and 1:8,000, besides an economic map of the Urals at 1:2,000. More than 100 maps in the state 1:1,000-scale series were reported completed and the remaining 79 were scheduled for completion by 1960. Among recently published geological maps were: a 1:2,500,000 map of the U.S.S.R.; a map of the Siberian platform at 1:1,000, of the Caucasus at 1:500,000; a tectonic map of the U.S.S.R. and adjoining countries at 1:5,000; and a schematic hydrological map of Siberia at 1:5,000 scale.

Asia.—The second meeting of the working party (of the UN Economic Commission for Asia) for a regional geological map for Asia and the far east was held in Bangkok, Thai., on June 9, 1956. Plans were made for financing the map, co-ordinating the various national contributions and their completion dates and preparing index maps showing status of surveys. Nearly one-fourth of Saudi Arabia was photographed by a U.S. aerial survey company for preparation of 1:50,000-scale photomaps.

The one-inch to the mile survey in Burma was scheduled for completion by 1957. The Geographical Institute of Indonesia constructed terrain models of Timor, Sumatra and Minahasa, and was compiling a new 1:250,000-scale map of Java. A geological map of Borneo at 1:1,000 scale was in work. The Japanese were compiling a new series of geological maps at 1:500,000 scale.

Africa.—The committee on the geography of Morocco published five plates with accompanying text for the atlas of Morocco. It was also preparing maps at 1:1,000 scale of vegetation, annual precipitation, geography of diseases and location of minerals.

A geological map of French Equatorial Africa in two sheets at 1:2,000 scale was published by the directorate of mines and geology of French Equatorial Africa and of Cameroun. It also produced a geological map of Madagascar in 13 sheets with overlays at 1:500,000 scale.

Oceania.—The Australian department of external affairs published a map of Antarctica at 1:10,000 scale. Detailed hydrographic surveys of parts of the Papuan coast were being made by a commercial petroleum company.

(See also COAST AND GEODETIC SURVEY, U.S.; GEOLOGICAL SURVEY, U.S.; NATIONAL GEOGRAPHIC SOCIETY.) (W. B. BR.)

Catastrophes: see DISASTERS.

Catholic Church: see ROMAN CATHOLIC CHURCH.

Catholic Community Service, National: see SOCIETIES AND ASSOCIATIONS, U.S.

Catholic Organizations for Youth: see SOCIETIES AND ASSOCIATIONS, U.S.

Catholic Welfare Conference, National: see SOCIETIES AND ASSOCIATIONS, U.S.

Cattle: see LIVESTOCK.

Cement. In 1955 world output (preliminary) of cement increased to 215,000,000 metric tons (237,000,000 short tons or 1,259,500,000 bbl.) as reported in MINERAL AND METAL PRODUCTION AND PRICES. The U.S. total was 23.6% of the world total.

United States.—As reported by the U.S. bureau of mines, the domestic output of cement for 1948-54 was as shown in the table.

Cement Industry in the U.S.

(Millions of barrels, 376 lb. each)

	1948	1949	1950	1951	1952	1953	1954
Production	208.9	212.9	230.3	249.5	252.7	267.7	275.9
Portland cement	205.4	209.9	226.0	246.0	249.3	264.2	272.4
Other varieties	3.4	3.2	4.2	3.4	3.4	3.5	3.5
Shipments	207.7	209.3	232.0	244.6	254.8	264.2	278.4
Portland cement	204.3	206.2	227.8	241.2	251.4	260.9	274.9
Other varieties	3.4	3.2	4.2	3.5	3.4	3.5	3.5
Stocks							
Portland cement	11.2	14.7	13.0	18.1	16.0	19.3	16.8
Clinker	3.8	4.6	3.9	4.7	5.3	5.3	5.3
Other varieties	0.2	0.2	0.2	0.2	0.1	0.1	0.1
Imports	0.3	0.1	1.40	0.9	0.5	0.4	0.5
Exports	5.9	4.6	2.4	2.9	3.2	2.6	1.9
Available supply	202.0	204.9	231.0	242.6	251.1	262.2	277.0

Preliminary data for 1955 showed another new high record, when 157 plants operated at capacity and progressed with expansion plans. Plants produced 296,829,000 bbl. of portland cement, shipped about 292,698,000 bbl. and exported 1,795,448 bbl. Year-end stocks stood at 17,516,000 bbl. Producers who in Oct. 1954 planned to expand capacity 38% by the end of 1959 apparently held to schedule in 1955, and capacity increased 7% over 1954.

In the first eight months of 1956, output of all types of finished portland cement was 7% higher than in the 1955 period and shipments were 6% higher. Capacity continued to expand.

(F. E. H.)

Census Data, U.S. The total population of the United States, including armed forces overseas, was an estimated 169,000,000 at mid-October 1956, an increase of nearly 18,000,000 from April 1, 1950, the date of the last census. For several years the bureau of the census had estimated an annual average population gain of 2,800,000, of which about 2,500,000 had been by natural increase (excess of births over deaths) and the remainder by net civilian immigration.

On July 1, 1956, according to the census bureau's annual mid-year estimates for the various age groups in the population, the population of all ages was 168,091,000, an increase of about 16,960,000, or 11.2%, over the 1950 census total. Of the total increase, 9,551,000, or 56.3%, was accounted for by the age group under 14 years and 5,540,000, or 32.7%, was accounted for by the age group of 45 years and over. The balance of the increase, 1,869,000, or 11.0%, was accounted for by the group 14 to 44 years of age. Within this group, however, the number of persons 18 to 24 years old decreased by 936,000, or 5.8%. As shown in Table I, the largest percentage increase since 1950 was among children between 5 and 13 years old, 31.7%. The next largest increase was for the population 65 years old and over, with a gain of 18.3%. The number of children under 5

Table I.—Composition of U.S. Population, by Age, 1956 and 1950

Age	Population including armed forces overseas		Change, April 1, 1950 to July 1, 1956	
	July 1, 1956	April 1, 1950	Number	Per cent
All ages	168,091,000	151,132,000	+16,960,000	+11.2
Under 5 years	18,680,000	16,164,000	+2,517,000	+15.6
5 to 13 years	29,213,000	22,180,000	+7,034,000	+31.7
14 to 17 years	9,543,000	8,409,000	+1,133,000	+13.5
18 to 24 years	15,145,000	16,081,000	-936,000	-5.8
25 to 44 years	47,056,000	45,385,000	+1,672,000	+3.7
45 to 64 years	34,028,000	30,720,000	+3,308,000	+10.8
65 years and over	14,426,000	12,195,000	+2,232,000	+18.3

years old increased by 15.6% as the high birth rate of recent years continued.

The white population numbered 149,823,000, an increase of 14,480,000, or 10.7%, over the 1950 total of 135,343,000. The nonwhite population numbered 18,268,000, an increase of 2,479,000, or 15.7% over the 1950 total of 15,789,000. The proportion of nonwhites in the population increased by 0.5%, from 10.4% in 1950 to 10.9% in 1956.

The excess of females over males in the total population increased from about 600,000 in 1950 to nearly 1,400,000 in 1956. The number of males in 1956 was estimated at 83,355,000, an increase of 8,089,000, or 10.8%, over the figure of 75,266,000 in 1950. The number of females, an estimated 84,737,000, had

increased by 8,870,000, or 11.7%, from the figure of 75,867,000 in 1950.

Another census study, based on March 1956 data for the civilian population, developed that of a total estimated gain of 14,700,000 between April 1950 and March 1956, about 12,400,000 was accounted for in the population living in the 168 standard metropolitan areas as defined in 1950 and 2,300,000 was accounted for in the population outside these areas. The civilian population of these metropolitan areas rose from 83,800,000 to 96,200,000, an increase of 14.8%, while the civilian population for the rest of the United States rose from 65,800,000 to 68,100,000, an increase of only 3.5%.

Table II presents the census bureau's estimates of the distribution of the population among the 48 states and the District of Columbia as of July 1, 1956.

Marital Status.—In March 1956, a marital status survey indicated that of an estimated 56,744,000 males and 60,975,000 females in the population 14 years old and over, about 39,967,000 men and 40,650,000 women were married. About 38,306,000 married couples were living together. Of 1,661,000 men living apart from their wives, 862,000 were separated and 799,000 lived apart for other reasons. Of 2,344,000 women living apart from their husbands, 1,242,000 were separated, and 1,102,000 were living apart from their spouses for other reasons. There were 13,516,000 single males and 11,126,000 single females 14 years old and over, about 2,335,000 widowers and 7,707,000 widows and 926,000 men and 1,492,000 women who were divorced.

Fertility of Women.—Women in the higher education brackets had fewer children on the average than women with less schooling, according to an analysis of 1950 census data published in 1956. Women college graduates of childbearing age who had been married 10 years or more had about half as many children on the average (1,954 children per 1,000 women) as married women who had not completed the seventh grade of school (3,632 children per 1,000 women). For all women ever married, 15 to 44 years old, by all degrees of education and durations of marriage, children ever born numbered 1,849 children per 1,000 women in 1950. A later survey, as of April 1954, of which results also were published in 1956, showed a gain in fertility which amounted to about 9.6% between 1950 and 1954 in the average number of children ever born per 1,000 women of childbearing age, 15 to 44 years old, who were ever married. In 1954, the number of children ever born per 1,000 women ever married, had risen to 2,037 children.

School Enrolment.—About 37,235,000 persons, 5 to 29 years old, were enrolled in school or college at the beginning of the 1955-1956 school year, an increase of 7,059,000, or 23%, over the 30,176,000 enrolled five years earlier. Kindergarten enrolment increased by 82%, elementary school enrolment by 24% and high school enrolment by 19%. College enrolment was at a slightly higher level than at the beginning of the 1950 decade, after a decline during the earlier years, with a 1955 total of 2,379,000 in college or professional schools.

College Age Population.—As of July 1, 1955, the number of persons of college age was at its lowest point in 25 years. There were 15,106,000 persons 18 to 24 years old, compared with 16,900,000 at the 1943-1944 peak. The number in this age group had been declining slowly as persons born during the 1930s, when the birth rates were at a low point, reached college age and replaced those in the group born during the late 1920s. The college age group was made up entirely of persons born during the depression years. For the remainder of the 1950 decade, small annual gains were expected. Between 1960 and 1965 the group would grow quite rapidly as the major wave of "war babies" and the initial wave of postwar babies reached college age, gaining, on the average, about 4% per year during this pe-

Table II.—Provisional Estimates of the Population, for Continental United States, by Regions, Divisions and States, July 1, 1956*

Region, division and state	July 1, 1956	April 1, 1950 (Census)	Increase (+) or decrease (—), April 1, 1950, to July 1, 1956 Amount	Per cent
Continental United States. . .	167,191,000	150,697,361	+16,493,000	+10.9
Regions				
North-eastern states . . .	42,273,000	39,477,986	+2,795,000	+7.1
North central states . . .	49,278,000	44,460,762	+4,817,000	+10.8
The south	51,694,000	47,197,088	+4,497,000	+9.5
The west	23,945,000	19,561,525	+4,384,000	+22.4
North-eastern states				
New England.	9,711,000	9,314,453	+397,000	+4.3
Middle Atlantic.	32,562,000	30,163,533	+2,398,000	+8.0
North central states				
East north central.	34,221,000	30,399,368	+3,821,000	+12.6
West north central.	15,057,000	14,061,394	+995,000	+7.1
The south				
South Atlantic.	23,971,000	21,182,335	+2,788,000	+13.2
East south central.	11,743,000	11,477,181	+266,000	+2.3
West south central.	15,980,000	14,537,572	+1,443,000	+9.9
The west				
Mountain.	6,127,000	5,074,998	+1,052,000	+20.7
Pacific.	17,818,000	14,486,527	+3,331,000	+23.0
New England				
Maine.	910,000	913,774	—4,000	—0.4
New Hampshire.	560,000	533,242	+27,000	+5.1
Vermont.	370,000	377,747	—7,000	—2.0
Massachusetts.	4,812,000	4,690,514	+121,000	+2.6
Rhode Island.	828,000	791,896	+36,000	+4.5
Connecticut.	2,232,000	2,007,280	+224,000	+11.2
Middle Atlantic				
New York.	16,195,000	14,830,192	+1,365,000	+9.2
New Jersey.	5,403,000	4,835,329	+567,000	+11.7
Pennsylvania.	10,964,000	10,498,012	+466,000	+4.4
East north central				
Ohio.	9,096,000	7,946,627	+1,150,000	+14.5
Indiana.	4,413,000	3,934,224	+478,000	+12.2
Illinois.	9,432,000	8,712,176	+720,000	+8.3
Michigan.	7,516,000	6,371,766	+1,144,000	+18.0
Wisconsin.	3,764,000	3,434,575	+329,000	+9.6
West north central				
Minnesota.	3,241,000	2,982,483	+258,000	+8.7
Iowa.	2,692,000	2,621,073	+71,000	+2.7
Missouri.	4,255,000	3,954,653	+300,000	+7.6
North Dakota.	657,000	619,636	+37,000	+6.0
South Dakota.	696,000	652,740	+43,000	+6.6
Nebraska.	1,414,000	1,325,510	+89,000	+6.7
Kansas.	2,103,000	1,905,299	+198,000	+10.4
South Atlantic				
Delaware.	402,000	318,085	+84,000	+26.4
Maryland.	2,812,000	2,343,001	+469,000	+20.0
District of Columbia.	866,000	802,178	+63,000	+7.9
Virginia.	3,651,000	3,318,680	+333,000	+10.0
West Virginia.	1,983,000	2,005,552	—23,000	—1.1
North Carolina.	4,423,000	4,061,929	+361,000	+8.9
South Carolina.	2,353,000	2,117,027	+236,000	+11.1
Georgia.	3,712,000	3,444,578	+267,000	+7.8
Florida.	3,770,000	2,771,305	+998,000	+36.0
East south central				
Kentucky.	3,017,000	2,944,806	+72,000	+2.5
Tennessee.	3,466,000	3,291,718	+175,000	+5.3
Alabama.	3,135,000	3,061,743	+74,000	+2.4
Mississippi.	2,124,000	2,178,914	—55,000	—2.5
West south central				
Arkansas.	1,815,000	1,909,511	—95,000	—5.0
Louisiana.	3,004,000	2,683,516	+321,000	+12.0
Oklahoma.	2,237,000	2,233,351	+3,000	+0.1
Texas.	8,925,000	7,711,194	+1,214,000	+15.7
Mountain				
Montana.	638,000	591,024	+47,000	+8.0
Idaho.	625,000	588,637	+36,000	+6.1
Wyoming.	321,000	290,529	+30,000	+10.4
Colorado.	1,612,000	1,325,089	+287,000	+21.7
New Mexico.	815,000	681,187	+134,000	+19.6
Arizona.	1,057,000	749,587	+308,000	+41.0
Utah.	812,000	688,862	+123,000	+17.9
Nevada.	247,000	160,083	+87,000	+54.6
Pacific				
Washington.	2,667,000	2,378,963	+289,000	+12.1
Oregon.	1,718,000	1,521,341	+196,000	+12.9
California.	13,433,000	10,586,223	+2,846,000	+26.9

*Figures include persons in the armed forces stationed in each area and exclude members of the armed forces overseas. Each estimate has been independently rounded to the nearest hundred from figures computed to the last digit; hence, the sums of parts shown may differ slightly from the totals shown. Percentages are based on unrounded numbers.

riod. By 1965, persons of college age would number about 20,043,000, one-third more than in July 1955, and by 1973, when the 1954 babies reached college age, this group at an estimated 26,360,000 would be 75% larger than in 1955.

Households and Families.—In March 1956, the estimated number of households (the equivalent to the number of occupied dwelling units) was 48,785,000, comprised of 42,548,000 primary families and 6,237,000 primary individuals. Urban and rural nonfarm households had increased by about 1,000,000 a year while rural farm households had decreased by about 100,000 a year since the beginning of the 1950 decade. Urban and rural nonfarm households numbered 43,136,000 and rural farm households numbered 5,649,000 in 1956 as compared with 37,279,000 urban and rural nonfarm and 6,275,000 rural farm households in 1950.

The average annual increase during the next 20 years in the number of households was expected to range between a low of about 700,000 and a high of nearly 1,000,000, according to a series of four projections published by the census bureau. By 1960, census projections indicated a total of between 50,499,000 and 51,838,000 households, and by 1975 the households total might range from 61,584,000 to 67,378,000. In announcing the projections, the census bureau cautioned that its figures should not be taken as forecasts but as estimates of the number of households which would result under several reasonable assumptions about future population changes.

Estimates of Income.—The median income of families was \$4,421 in 1955 as compared with \$3,319 in 1950, an increase of about \$1,100 or 33.2% in five years. About 41% of all families had incomes of \$5,000 or more; another 41% had incomes ranging between \$2,000 and \$5,000; and 18% had incomes under \$2,000. The 1955 median income of urban families was \$4,840; of rural nonfarm families, \$4,328; and of rural farm families,

29.5% in April 1955 as compared with 28% in 1954 and 21.5% in 1947.

Census of Agriculture.—During 1956, the final results of a nationwide inventory of farms and farm operations, conducted in the fall of 1954, were published, providing new statistics about the agricultural enterprises in each of 3,000 counties. One of the most significant changes revealed by the 1954 farm census was a decline of about 600,000 or 11.1% in the number of farms to 4,782,416, from a 1950 census total of 5,382,162. The value of farm products sold increased, however, by 11.8% to \$24,644,477,087 in 1954 from sales of \$22,051,129,389 in 1949.

The 1954 statistics also revealed that three-fourths of all farms were operated by their owners. The bulk of farm production came from the two-thirds of the farms classified as commercial, and slightly more than three-tenths of the total value of products was accounted for by the 4% of commercial farms with gross sales of \$25,000 or more.

More than 500,000 farms were part-time farms, whose individual sales amounted to less than \$1,200 a year and whose operators worked off the farm for 100 or more days during 1954 or whose family income from nonfarm sources exceeded the farm income. The self-sufficient farm was virtually nonexistent. In 1954, among the commercial farms three in five hired some labour, three in four bought feed for their livestock, four in five bought gas and oil, and seven in ten bought fertilizer. Part-time farms also reported expenditures for one or more of the items. Seven in ten farms reported tractors, more than nine in ten had electricity, more than one-half had telephones, about a third had home freezers and about a third had television sets. The average farm in 1954 was valued at about \$20,000 for land and buildings.

Business Statistics.—Results of the 1954 census of business were published during 1956.

Retail establishments numbered 1,721,650 and reported a year's payroll of \$18,198,662,000 and sales of \$169,967,748,000. At the middle of November, 1955, employees of retail stores numbered 7,124,331, of whom 5,778,351 were full-time workers. In addition, there were 1,765,752 proprietors actively employed in the operation of retail stores.

Wholesale establishments numbered 252,318 with payrolls of \$11,021,450,000 for the year, 2,590,236 employees in mid-November, and 151,213 active proprietors. Merchant wholesalers numbered 165,153, had sales of \$101,100,941,000 in 1954 and year-end inventories of stocks valued at \$9,524,871,000. Manufacturers' sales branches and sales offices numbered 22,590, had sales of \$69,533,784,000 and inventories valued at \$2,152,720,000. Petroleum bulk plants, terminals and liquid petroleum gas facilities numbered 29,189 with sales of \$16,038,372,000 and inventories of \$912,501,000. Merchandise agents and brokers numbered 22,131 with sales of \$39,250,509,000 and inventories of \$103,232,000. Assemblers of farm products numbered 13,255 with sales of \$9,050,816,000 and inventories of \$385,348,000. Combined inventories of all wholesale establishments in the five types of operation were \$13,078,672,000.

Selected service establishments, numbering 786,178, had receipts in 1954 amounting to \$23,408,414,000 and payrolls of \$6,486,968,000. Paid employees in mid-November numbered 2,351,278 of whom 2,015,780 were working full time. There were 784,005 proprietors engaged in operation of service establishments.

The census bureau also announced results of the 1955 annual survey of retail sales with retail store sales amounting to an estimated \$185,484,000,000, an increase of 9% over 1954 sales.

Census of Manufactures.—Total manufacturing employment in 1954, including personnel at manufacturing establishments, central administrative offices and auxiliary units, was

Table III.—Number and Income of Families in the U.S., 1955

Family income	Number of families	Family income	Number of families
Total	42,800,000	\$4,000 to \$4,999	6,600,000
Under \$1,000	3,300,000	\$5,000 to \$5,999	5,400,000
\$1,000 to \$1,999	4,200,000	\$6,000 to \$6,999	4,100,000
\$2,000 to \$2,999	4,700,000	\$7,000 to \$9,999	5,500,000
\$3,000 to \$3,999	6,300,000	\$10,000 to \$14,999 . . .	2,100,000
		\$15,000 and over	600,000

\$2,111. The estimated number of families, by size of income in 1955, is shown in Table III.

Men's income reached a new record level in 1955 with a median of \$3,400, a gain of about \$150 over the previous year. The average income of men had been rising steadily between 1945 and 1952 but levelled off at about \$3,200 in 1953 and 1954. Among women, the median income was \$1,100 in 1955, about the same as during the preceding three years. Since the close of World War II, the average income of men increased by about \$1,500, or 85%, while that of women increased about \$200, or 24%.

Civilian Labour Force.—Employment reached record levels in the summer of 1956. In August the civilian labour force was estimated at 68,947,000 persons, of whom 66,752,000 were employed and 2,195,000 were unemployed.

A work experience survey of the population disclosed that an estimated 75,353,000 persons were employed during all or part of 1955, an increase of 3,554,000 since 1954, the largest addition in any year since World War II. Women accounted for about two-thirds of these additional workers. The number of women with work experience during 1955 climbed to an unprecedented 27,729,000. The number of men with work experience was 47,624,000.

The number of working wives reached an all-time high of 11,800,000 in April 1955, an increase of about 600,000 over the previous year. The proportion of married women in the labour force had increased each year since World War II, reaching

5,153,090 with payrolls of \$66,000,000,000. Employment at operating manufacturing establishments was 15,700,000 with payrolls of \$63,100,000,000. Of the total of 288,144 establishments, 97,666 had between 1 and 19 employees, 63,562 had 20 to 99 employees, and 26,916 had 100 or more employees. Value added by manufacture (value of shipments less cost of materials, supplies, fuel, electric energy and contract work) was reported as \$16,759,421,000. Capital expenditures for new plant and equipment by plants in operation during 1954 amounted to \$7,817,15,000.

Among the 20 major industry groups, transportation equipment industries accounted for \$14,000,000,000 value added by manufacture to lead all groups. The food industries and kindred products group accounted for \$13,500,000,000 value added by manufacture. For other industry groups, value added by manufacture was \$12,300,000,000 for machinery except electrical; \$1,400,000,000 for primary metals; \$9,400,000,000 for chemicals and products of chemicals; \$7,600,000,000 for fabricated metal products; \$7,400,000,000 for electrical machinery; \$6,100,000,000 for printing and publishing; \$5,100,000,000 for apparel and related products; \$4,800,000,000 for textile mill products; \$4,500,000,000 for pulp, paper and products; \$3,800,000,000 for stone, clay and glass products; \$3,200,000,000 for lumber and wood products; \$2,600,000,000 for petroleum and coal products; \$2,100,000,000 for instruments and related products; \$2,000,000,000 for furniture and fixtures; \$1,900,000,000 for rubber products; \$1,600,000,000 for leather and leather products; \$1,000,000,000 for tobacco manufactures; and \$4,100,000,000 for miscellaneous products, including ordnance.

(See also BIRTH STATISTICS; BUDGET, NATIONAL; EMPLOYMENT; HOUSING; IMMIGRATION, EMIGRATION AND NATURALIZATION; INCOME AND PRODUCT, U.S.; INTERNATIONAL TRADE; MARRIAGE AND DIVORCE; WAGES AND HOURS; WEALTH AND INCOME, DISTRIBUTION OF.) (R. W. B.)

Centennials: see CALENDAR, 1957, page 64.

Central African Federation: see RHODESIA AND NYASALAND, FEDERATION OF.

Cereals: see BARLEY; CORN; OATS; RICE; RYE; WHEAT.

Ceylon. A realm of the Commonwealth of Nations, Ceylon occupies an island southeast of the most southerly point of India. Area: 25,332 sq.mi. Pop.: (1953 census) 8,098,177, including 5,621,332 Sinhalese, 908,705 Ceylon Tamils, 83,146 Ceylon Moors and 984,327 Indians (mostly Tamils); (1955 est.) 8,678,000. Language: Sinhalese 69%, Tamil 21%. Religion: Buddhist 61%, Hindu 22%, Christian (mainly Roman Catholic) 9%, Moslem 7%. Chief towns (pop., 1953 census): Colombo (cap.) 423,481; Jaffna 77,218; Dehiwala-Mt. Lavinia 108,610; Moratuwa 58,160; Kandy 57,359; Galle 55,874; Kotte 58,621. Queen, Elizabeth II; governor general in 1956, Sir Oliver Goonetilleke; prime minister, S. W. R. D. Bandaranaike.

History.—Ceylon was admitted to membership of the United Nations in Dec. 1955, and for the first time a Ceylon representative, R. S. S. Gunawardene, Ceylonese ambassador to the United States, appeared at the rostrum of the general assembly to pledge his country's support for the ideals of the organization. This was the prelude to events marking a new stage in Ceylon's political development since becoming an independent nation in 1948. At a general election in April the United National party, representing the ruling influence in Ceylon for the past generation, suffered an unexpected and overwhelming defeat. Sir Johnotelawala, the prime minister, gave way to S. W. R. D. Bandaranaike, leader of the Socialist M.E.P. party, and a new government was formed. The program of the new government embraced a neutralist foreign policy, in accord with that of

India, the establishment of a republic and the adoption of the principle of nationalization of essential services and industries. It was also laid down that Sinhalese would be adopted as the national language, that imperial honours would be abolished and that agreement would be sought for relinquishment by Great Britain of defense bases in Ceylon. The question of the bases was taken up by the prime minister when he attended a commonwealth conference in London in June-July. While agreeing that the naval station at Trincomalee and the air base at Katunayake should revert to Ceylon, the British government asked for user facilities, and these were the subject of further negotiation in November. In November Bandaranaike visited New York city to address the general assembly of the United Nations. The neutral attitude adopted in foreign relations implied non-involvement in any power bloc, friendship and trade with all countries and support for the United Nations.

At the Suez canal conference in London in August, the Ceylon representative, Sir Claude Corea, high commissioner in the United Kingdom, declared his country's alignment with India, the U.S.S.R. and Indonesia in opposition to the majority proposals of the conference. Subsequently, Corea headed a Ceylon delegation to Moscow and Peking, when it was agreed to set up closer political, economic, trade and cultural relations between Ceylon on the one hand and the U.S.S.R. and the People's Republic of China on the other.

In his budget speech in July the new minister of finance, Stanley de Zoysa, reported an increase in value both of exports and domestic production and stated that the national income per head in 1955 was Rs. 593 as compared with Rs. 572 for the previous year. Goods to the value of Rs. 1,940,000,000 were exported, while the value of imports was Rs. 1,460,000,000, resulting in a favourable trade balance of Rs. 480,000,000. The finance minister gave the total of foreign aid authorized for Ceylon under the Colombo plan, the U.S. aid program and other international schemes as Rs. 110,000,000, which was being received at the rate of Rs. 45,000,000 a year. This enabled the country's six-year development program to be stepped up, and the government decided to establish a national planning board to review long-term economic problems. The decision was also taken to push forward industrialization at a more rapid rate and to accelerate the harnessing of Ceylon's hydroelectric resources.

The six-year Colombo port development scheme, costing Rs. 100,000,000 and involving the building of alongside berths, was completed toward the end of the year. Labour unrest among harbour workers, culminating in a series of strikes, was a serious factor in slowing down the operation of the port. A weekly international air service between Colombo, Amsterdam and London, run by K.L.M. and Air Ceylon under a joint financial arrangement, started in February. A trade agreement was signed with Czechoslovakia, and the rubber-rice agreement with China was renewed.

Celebrations of the 2,500th anniversary of the death of Buddha started in May and made 1956 a historic year in the Ceylon Buddhist calendar. Devotional observances were held at temples and shrines throughout the country, and a series of commemorative postage stamps was issued. A 300-year-old bronze statue of the Buddha was received from Burma. (Jo. HN.)

Education.—Schools (May 1955): aided schools: English primary 20, pupils 12,810, teachers 502; English secondary (including junior) 478, pupils 190,112, teachers 7,355; collegiate 151, pupils 109,315, teachers 4,805; Sinhalese and Tamil 5,215, pupils 1,257,661, teachers 34,602; estate schools 891, pupils 67,110, teachers 1,078; *pirivenas* (religious training schools) 150, pupils 5,848, teachers 609. Unaided schools 64, pupils 16,288, teachers 786. Vocational (including fine arts) 8. Teacher training colleges (English, Sinhalese and Tamil) 18, students 2,905. One university with 2,429 students (1955-56) and (1954) 253 teaching staff.

Finance and Banking.—Monetary unit: rupee with an average exchange rate of Rs. 4.76 to the U.S. dollar in March 1956. Budget (1954-55 revised est.: 1955-56 in parentheses): revenue Rs. 1,158,000,000 (Rs. 1,162,000,000); expenditure Rs. 1,109,000,000 (Rs. 1,268,000,000). Total pub-

lic debt (1954) Rs. 974,181,000 of which Rs. 192,117,000 sterling loan; (1955): Rs. 1,034,315,000 of which Rs. 92,117,000 sterling loan. Currency circulation (Dec. 1954) Rs. 376,000,000, (Dec. 1955) Rs. 384,500,000. Deposit money (Dec. 1954) Rs. 601,000,000, (Dec. 1955) Rs. 675,000,000. Gold and foreign exchange (Dec. 1954) U.S. \$197,000,000, (Dec. 1955) U.S. \$251,000,000.

Foreign Trade.—(1955) Imports Rs. 1,460,000,000, exports Rs. 1,940,000,000. Main sources of imports: U.K. 21%; India 17%; continental E.P.U. (European Payments union countries) 11%; Burma 8%; other sterling area 13%; U.S. and Canada 4%. Main destinations of exports: U.K. 27%; U.S. and Canada 14%; Australia 8%; other sterling area 10%; continental E.P.U. 11%. Main exports: tea 62%; rubber 18%; coconut products 11%.

Transport and Communications.—Roads (fit for motor traffic, 1955) 22,400 km. Motor vehicles in use (1954): passenger 51,800, commercial 19,600. Railways (1955) 1,442 km.; passengers carried (1954) 18,218,556; freight carried (1955) 1,632,000,000 metric tons. Air transport (1955): passenger-km. 9,444,000; freight 168,000 ton-km. Telephones (Jan. 1955) 25,943. Licensed radio receivers (1954) 94,000.

Agriculture.—Main crops (metric tons, 1955; 1954 in parentheses): tea 172,400 (166,300); rubber 95,300 (95,400); coconut oil 154,000 (140,800); copra 290,000 (220,000). Miscellaneous production (metric tons, 1954; 1953 in parentheses): millet 23,000 (22,000); cocoa beans 3,200 (3,000); sweet potatoes and yams 43,000 (42,000); cassava 234,000 (223,000). Livestock (Sept. 1954): cattle 1,227,000; sheep 95,000; buffaloes 707,000; goats (1953) 498,977; pigs (1953) 74,370.

Industry.—Production (1955): electricity 182,400,000 kw.hr.; cement (est.) 79,200 metric tons. Graphite (exports, 1954) 7,885 metric tons.

ENCYCLOPEDIA BRITANNICA FILMS.—Ceylon (1955).

Chad: see FRENCH EQUATORIAL AFRICA.

Chambers of Commerce: see SOCIETIES AND ASSOCIATIONS, U.S.

Channel Islands: see GREAT BRITAIN & NORTHERN IRELAND, UNITED KINGDOM OF.

Charles Hayden Foundation: see SOCIETIES AND ASSOCIATIONS, U.S.

Cheese: see DAIRY PRODUCTS.

Chemistry. During 1955 the U.S. chemical industry achieved sales of \$23,500,000,000 and completed new plants worth \$772,000,000. Combined sales of all synthetic organic chemicals during the year amounted to 43,090,000,000 lb. valued at \$5,590,000,000. The country imported \$255,000,000 worth of chemicals.

Indications were that 1956 would prove to be an even bigger year, despite the steel strike during the summer which deprived the chemical industry of a market for chemicals as well as an important source of organic raw materials, the steel industry's coke ovens. Total sales for 1956 were expected to top \$24,000,000,000. During the first half of the year, sales were \$12,100,000,000, 5% above the last six months of 1955. Price increases accounted for only 0.5% of this increase. The Manufacturing Chemists' association surveyed the industry and concluded that it expected to complete \$1,600,000,000 worth of new facilities during 1956 and 1957.

Production for the first six months of 1956 had gained 8% over the same period of 1955 and 2% over the latter six months of that year. In May production hit a record 179 (1947-49 equals 100) as registered by the federal reserve board's seasonally adjusted index. Moreover, during the following two months, the index of production fell off only slightly, to 178.

Raw material consumption for inorganic chemical production was an indication of the vital force inorganic chemical production had become in the national economy. During 1955 the country produced an estimated 5,400,000 long tons of sulphur. This was used mainly to make 15,700,000 short tons of sulphuric acid, the chemical industry's largest single tonnage product. Preliminary figures indicated that both those figures would be surpassed during 1956.

The chemical industry was using 57% of the approximately 9,300,000 tons of lime sold in the U.S. each year. In addition, chemical and related companies were producing another 2,000,000 tons a year for their own use. The industry was taking 75% of the national salt output, which during 1953 amounted to 20,800,000 tons. During that same year, the latest one for which government figures were available, the chemical industry used

12,500,000 tons of phosphate rock, purchased \$539,000,000 worth of fuel and electricity and used 2,800,000,000 gal. of water.

World Trade.—In the important struggle for world chemical markets, west Germany continued to score impressive gains. According to figures compiled by the United Nations, west Germany's chemical exports (combined with those of Austria) had surpassed those of the United Kingdom during 1954. In 1955 the two were exporting chemicals at a rate that was reducing the lead of the U.S.

Value of Chemical Exports of Leading Chemical Exporting Countries

	1952	1954	1955 rate*
United States	\$822,500,000	\$1,031,000,000	\$1,100,000,000
United Kingdom	515,400,000	570,800,000	641,000,000
West Germany and Austria . .	378,900,000	636,000,000	688,000,000
France	286,700,000	336,000,000	346,000,000
Belgium, Netherlands and Luxembourg	318,900,000	341,600,000	369,000,000
Canada	149,800,000	198,900,000	238,000,000

*Based on figures for the first nine months.

Source: United Nations Commodity Trade Statistics.

The seriousness with which the Germans were approaching their task was evidenced by the fact that their exports amounted to more than 20% of their total chemical sales of \$3,400,000,000 during 1955, while U.S. exports came to less than 5% of all U.S. chemical sales. Other striking differences between the two chemical industries were in their corporate make-up. In the U.S. 15 large chemical companies employed 353,000 of the total chemical work force of 800,000 and accounted for 25% of all chemical sales. In west Germany, only three companies employed 103,000 of the 400,000 chemical work force and accounted for 25% of all chemical sales.

Plastics.—The U.S. plastics industry sold 3,200,000,000 lb. of plastics and resins in 1955 valued at \$1,078,000,000. Polyethylene continued to be the fastest-growing single product. Production had risen to 402,000,000 lb., and plants being built were expected to raise capacity to at least 600,000,000 lb. by the end of 1956.

Much interest was being centred on new types of polyethylene. In the conventional process for making it, developed by Imperial Chemical Industries Ltd. (I.C.I.), ethylene is polymerized under pressure to yield a product that is essentially a long chain of carbon atoms placed at random intervals along the main chain. This random side chain branching accounts for polyethylene's flexibility and other physical characteristics. The new polymerizations were utilizing catalysts rather than pressure and were producing highly oriented main chains with little if any side chain branching. These products (linear polyethylenes) are characterized by greater rigidity and considerably higher melting or softening points.

Karl Ziegler had pioneered the new systems in west Germany. But for the most part he had confined his work to polymerization of ethylene (two carbon atoms). In Italy Giulio Natta of the Milan institute had adapted the technique to propylene (three carbon atoms), butadiene (four carbon atoms) and molecules as large as ten carbon atoms. In the U.S., Phillips Petroleum Co. had independently developed a catalyst system that would give substantially similar results. Standard Oil Co. (Indiana) had developed still another catalytic system.

Firms on the European continent, in England and in the U.S. had obtained licences on Ziegler's methods and had advanced them to varying stages of commercialization. Montecatini of Italy, which had sponsored Natta's work, operated a pilot plant for making polypropylene and was building a larger plant to make several tons of polypropylene a day. First products of the plant were expected to be used in moulded articles and films. But polypropylene possesses properties that make it potentially useful for fibres, and Montecatini expected to explore that field

eventually. Montecatini also hoped to try polymerizing molecules larger than propylene. Phillips was building a large plant to make polyethylene by its own process and was licensing several other firms that were in the process of building somewhat smaller plants. Phillips reported that its process could be used to make polypropylene and that it was working on methods for copolymerizing ethylene and propylene to produce a new series of plastics with properties intermediate between those of polyethylene and polypropylene. A number of firms in Europe and in the U.S. were working on polypropylene and the copolymers. Standard Oil (Indiana) revealed no commercial plans for its process, but did grant licences to two other firms that were starting to build commercial plants for it.

The same techniques being used to make linear plastics were stimulating research and development in elastomers. It had long been known that natural rubber was a highly oriented polymer of isoprene. Efforts to duplicate it synthetically failed because of an inability to direct the polymerization toward an oriented product. Goodrich-Gulf revealed that the "synthetic-natural" rubber it had announced in 1954 and had been producing in a pilot plant was made by Ziegler techniques. Goodyear also reported that it had a synthetic equivalent of natural rubber produced by Ziegler catalysis. Firestone was making a comparable product using another catalyst system (lithium metal dispersed in petroleum oil). Phillips was putting its process to good use in synthetic rubber experiments. But even before these products were placed

on the market, scientists were starting to look beyond them to improved rubbers. They knew that there were eight different ways in which isoprene could be joined together to make a highly oriented polymer. It might be possible, they reasoned, to make eight different types of rubber synthetically that way, each of which would be superior to natural rubber for certain applications.

Synthetic Fibres.—Several firms decided to introduce new acrylic (based on acrylonitrile) fibres: American Cyanamid Co. (Acrilan), Tennessee Eastman (Verel) and Dow Chemical Co. (Dacron). Goodrich started semicommercial production of darlan, which began appearing in women's pile coats during the winter of 1955-56. (Darlan is a dinitrile, based on vinylidene cyanide; it is classed with the acrylics because of the similarity in structure and in some physical properties.)

Du Pont introduced a new colour-sealed black nylon made by solution-dyeing, the method of incorporating the pigment right in the polymer. Chemstrand developed a process for dyeing nylon that, it claimed, would combine colour fastness with uniformity of dyeing. Previously, colour fastness had been sacrificed somewhat for uniformity. Japanese researchers developed a fibre made from a wood waste chemical (the methyl ester of a benzoic acid derivative), and the Kokoku Rayon company decided to build a pilot plant for it.

Nuclear Energy.—Chemical engineers were continuing their investigations into nuclear radiation sources to energize chemical reactions. Goodyear was studying gamma-radiation as a substitute for chemicals in vulcanization; a number of refiners were experimenting with it as a means of producing gasoline and lubricating oils. Both fields required a great deal more research before firm conclusions could be reached concerning the commercial practicality of the idea.

Japanese researchers reported favourable results on the use of gamma-rays to improve fibres made from polyvinyl alcohol. They had been able to raise the fibres' wet-heat resistance, thus overcoming one of its principal drawbacks. (Made from cheap materials and possessing some attractive properties, the fibre solves in hot water and does not stand up well under repeated wrings.)

Radiation to kill bacteria in foods, thereby making it pos-

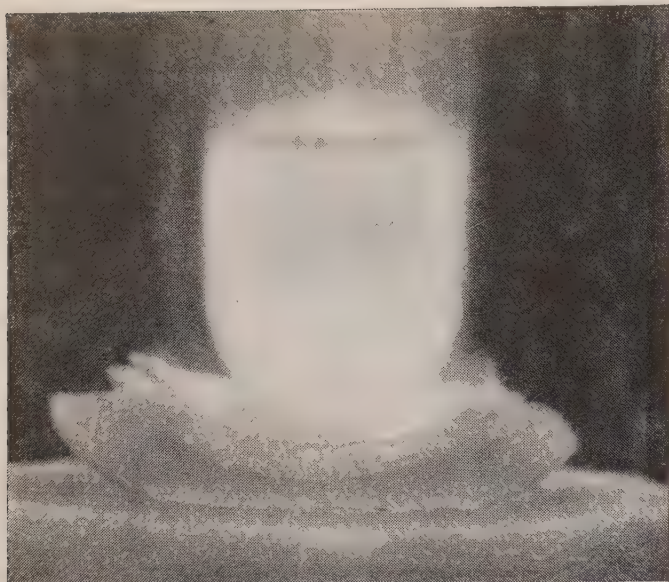


CHEMICAL FOAM, an organic isocyanate which when mixed with alkyd resins, alcohol or water, reacts chemically to produce expanded foam shapes up to 20 times the original volume. The ingredients are mixed together and poured into a mould at room temperature; the completed material is ready in only a few minutes. The chemical was a development of the E. I. du Pont de Nemours and company in 1956

sible to store foods for long periods without refrigeration, had long been a favourite subject for research. One obstacle was that food so treated had an undesirable taste. Co-operative work by the army quartermaster corps and Evans Research and Development indicated that it might be possible to restore the flavour to these foods by the use of enzymes which would act on food precursors unaffected by radiation. (If it proved possible to do this, the same technique might be applied with profit to the processing of some canned and frozen foods.)

In the field of generating electricity through nuclear sources, chemical operations were being employed to solve problems dealing with fuel processing and waste treatment. But even before the problems of harnessing fission for peaceful applications were solved, chemical engineers were starting to look ahead toward the control of fusion (as in the hydrogen bomb). The temperatures involved, however, were of the order of 100,000,000° F., and it seemed that any real progress in that direction would be at least 20 years distant.

Drugs.—The new drugs for mental conditions, introduced in 1955, quickly established themselves in 1956. Estimates of their U.S. sales varied greatly from \$50,000,000 to \$135,000,000 a year. Meproamate (Miltown, Wallace; Equanil, Wyeth) became the nation's largest-selling prescription item. A half-dozen other tranquillizers were vying for a share of the market, which some persons felt would eventually reach \$500,000,000 a year. Early reports of their effectiveness continued to be encouraging. A large Veterans administration hospital in Northampton, Mass., reported that the numbers of mental patients discharged increased 36% after the introduction of tranquillizing drugs. But there was some fear that although they were proving themselves valuable tools in mental therapy, they were being administered too indiscriminately. (See also MEDICINE; PHYSIOLOGY.)



FROZEN NITROGEN glowing at a temperature near absolute zero, a photograph of the element made during a study of free radicals at low temperatures by the U.S. national bureau of standards in 1956

Antibiotics were again proving their versatility. They were being used to preserve food by killing decay-causing bacteria. The U.S. Food and Drug administration authorized antibiotic treatment for poultry, and the Canadian government approved it for fish. It was estimated that spoilage between the time fish was caught and the time it was placed under refrigeration was costing Canadian fishermen \$25,000,000 a year, and it was hoped that antibiotics could prevent a major portion of that loss.

Metals.—The need for zirconium as a material of construction in nuclear reactors moved the U.S. Atomic Energy commission to contract for 2,200,000 lb. of zirconium every year for five years. Three companies were building plants to supply the metal: National Distillers Products Corp., NRC Metals (a subsidiary of National Research Corp.) and Carborundum Metals, which had been the only commercial supplier of zirconium in the U.S.

Normally, chemical engineers consider iron and steel as outside their sphere of operations. But, as indication that the two technologies were moving closer together, seven U.S. steel companies joined with a chemical construction firm, Blaw-Knox Co., in building a demonstration plant for recovering sulphuric acid from waste pickle liquor. Also, Bethlehem Steel Co. and Hydrocarbon Research were investigating a fluid bed process for making pig iron directly from iron ore. (A fluid bed consists of solids so fine that they assume some of the characteristics of a fluid.) Another firm, Dorr-Oliver, Inc., was building a pilot plant of 25 tons' daily capacity for a steel company to employ the fluid bed technique for reducing haematite to magnetite. On a smaller scale, it had experimented with a fluid bed process for reducing haematite to metallic iron in two stages.

Chemical engineers in Great Britain were going a step further. They were exploring a process for making steel directly from iron ore. They revealed that they had been able to make a recognizable form of steel, which they called cyclosteel, by the method. The problems of building equipment to contain the severe conditions called for in this process, however, were thought to be considerable.

Coal v. Petroleum.—Petroleum had gradually replaced coal as the most important source of organic chemicals in the U.S. This trend continued during 1956. Naphthalene, for example, had traditionally been made only from coke ovens. But petroleum refiners were considering making it from their plant streams, either by concentrating the naphthalene present as such or by

demethylating methyl naphthalene.

However, the world's abundant coal reserves, compared with the dwindling supplies of petroleum, had stimulated a great deal of interest in improved methods for obtaining chemicals from coal. Two of the most notable experiments along those lines were being conducted in West Virginia. At Belle, du Pont was running a unit to make synthesis gas (a mixture of carbon monoxide and hydrogen) by oxidizing coal. At nearby Institute Union Carbide and Carbon Corp. was running a large pilot plant to unlock some of the chemical values of coal intact by treating it with hydrogen. In 1956 du Pont decided to switch its coal operations to natural gas for reasons of economy, and Carbide sent its hydrogenation process back to a smaller pilot plant.

New methods for treating coal were springing up, however. Also in West Virginia, Olin-Mathieson Chemical Corp. started a unit to make synthesis gas from coal using a process developed by the Texas Co. In Australia, the State Gas and Electric was getting ready to start a \$22,500,000 plant to make town gas from brown coal (lignite). It was expected to supply one-third of Melbourne's gas requirements. Plans called for the eventual production of chemicals and liquid fuels in the plant.

American Gilsonite forged ahead with plans to build a \$16,000,000 refinery and mining project to make coke and high octane gasoline from Utah gilsonite (a resinous asphaltite). This was the country's first commercial-scale project to make conventional petroleum products from nonpetroleum raw materials. Included in the project was a 71-mi. pipeline to move the solid gilsonite, as a slurry, from the mine to the refinery in Colorado.

New Products.—In co-operation with the U.S. air force and other groups, Dow Corning Corp. produced a fluorinated silicone for the first time. It is able to withstand solvents under a wide range of temperatures. Carbide and Carbon developed a process for making peracetic acid from acetaldehyde. It was claimed that the peracetic acid could be employed economically to put a special functional group (the epoxy bond) on a whole series of chemicals. This was said to permit the production of many new chemicals that had previously been unavailable commercially.

In the agricultural chemical field, gibberellic acid, a rare chemical derived from fungus, was found in limited tests to be a powerful growth stimulant for plants and trees. But even though small quantities (less than 1 part per 1,000,000 in water) demonstrated a pronounced effect, there was so little available that a synthesis would probably be needed for it to become commercially significant, even if it was as effective as the tests indicated. Sesamolin, another rare chemical, was found to be a potent synergist for pyrethrins. But there was no practical commercial process for making it. Two new herbicides, 2, 4-DB and MCPB (derivatives of butyric acid), gave promise of high toxicity toward broadleaf weeds plus low hazard for crops such as alfalfa, corn and clover. The department of agriculture was investigating the possibility of increased biological warfare on insects. It was testing the use of microorganisms—viruses, bacteria, fungi and nematodes—as a supplement to chemicals in controlling insects.

New Processes.—A team of researchers from the Swiss firm Ferminech and Co. succeeded in synthesizing ambergris, the rare perfume ingredient found in the stomachs of sick whales. Dragoco, a German firm, also reported a synthesis of ambergris. Because of the costliness of labour and other factors in making perfume, the work did not open up any opportunity for price reductions in perfumes. It did mean that ambergris might be used in less expensive perfumes. More important, it meant that for the first time chemists would have enough of the compound to explore potential applications in medicine and other fields.

Two groups (General Aniline and Film Corp. and a research association set up by U.S. tanners) developed independent meth-

ods for producing a washable leather. This was expected to be a boon for makers of leather gloves.

A plan for transporting natural gas in liquid form was promising to open up new areas for petrochemical development. Conceived by Willard Morrison (inventor of the "no-draught" windows in autos) for the Union Stock Yards of Chicago, Ill., the idea made use of the fact that during liquefaction natural gas shrinks by a factor of 600. His original project was to make use of the pressure of gas in the wells near the mouth of the Mississippi river to supply a portion of the energy needed to liquefy it. Stored on barges, the liquid would be allowed to vaporize under carefully controlled conditions, and the vapour would be burned as fuel to power the barges to Chicago. On arrival, most of the material would continue to be in the form of a cold liquid, which would be used as a refrigerant in the stockyards. After its cold values had been sapped, it would be a high-quality gas for home or industrial fuel or for use as a chemical raw material.

Continental Oil Co. acquired a financial interest in the project, and a special firm (Constock) was organized. In England, Shell was building barges for a similar project to transport natural gas from Venezuela.

(See also BIOCHEMISTRY; CHEMOTHERAPY; FOREIGN INVESTMENTS; PHYSICS; PLASTICS; VITAMINS AND NUTRITION.)

(D. P. B.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Antibiotics* (1952); *Atom and Agriculture* (1953); *Atom and Biological Sciences* (1953); *Atom and Industry* (1952); *Atom and Medicine* (1952); *Catalysis* (1937); *Chemistry and a Changing World* (1953); *Colloids* (1937); *Electrochemistry* (1937); *Molecular Theory of Matter* (1932); *Oxidation and Reduction* (1932); *Preface to Chemistry* (1954); *Science and Agriculture* (1953); *Velocity of Chemical Reactions* (1937).

Chemotherapy. **Aminitroazole (Tritheon).**—One of a series of related chemical compounds (amino-nitrothiazoles), aminitroazole (2-acetamido-5-nitrothiazole) was shown in 1956 to be effective in the treatment of a protozoan infection, vaginal trichomoniasis, in monkeys when administered orally. Subsequently the drug was used orally for the control of vaginitis caused by *Trichomonas vaginalis* in human beings. This represented the first successful use of a drug given orally in this type of infection.

Bryamycin.—This new antibiotic was isolated from a new species of mould, *Streptomyces hawaiiensis*, obtained from soil collected in Hawaii. Chemically it was shown to be a polypeptide containing sulphur. It was shown to be active against Gram-positive bacteria including *Staphylococcus aureus*, *Streptococcus pyogenes*, *Gaffkya tetragena* and *Diplococcus pneumoniae*. It exhibited little or no activity against Gram-negative microorganisms. When injected into mice, it protected them successfully against experimental infections by *D. pneumoniae* and *Strep. pyogenes*. In animal studies it showed little toxicity, and its activity was not affected by the presence of 10% human serum in test tube tests.

Bynamid (N-butyl-3-phenyl salicylamide).—This synthetic drug, derived from salicylamide, was shown to exert a strong inhibitory effect on fungi of the dermatophyte group, which cause many of the common superficial fungous infections of the scalp, skin and extremities of man. Oddly enough, most of the common saprophytic (nonpathogenic) fungi tested were not inhibited at all. In culture media it proved 6 times more effective than undecylenic acid and 60 times more effective than salicylic acid in restricting the growth of *Trichophyton mentagrophytes* and *rubrum* and *Microsporum audouini* and *canis*. None of these dermatophytes developed resistance to the drug. Another study of Bynamid and 32 other salicylamide derivatives, most of which were also derivatives of 3-phenyl salicylamide, revealed that, all factors considered, Bynamid and N-(4-hydroxyphenyl)-3-

phenyl salicylamide were the best fungistatic agents of the group for the dermatophytes tested.

Clorpactin WCS-90.—This compound was developed from a group of hypochlorous acid derivatives with antiseptic properties. Clorpactin was shown to contain 7% to 8% available chlorine and to sterilize on contact. A study of its virucidal action indicated that it immediately and completely inactivated the Lansing poliomyelitis virus in the test tube; when mixed with virus and injected immediately into animals, it prevented the development of paralysis. It was active also against eastern equine encephalomyelitis virus. The compound showed little or no toxicity in animal studies.

DON.—This new tumour growth-inhibitory substance was isolated from broth culture filtrates of an unidentified strain of *Streptomyces* found in a Peruvian soil sample. It was identified chemically as 6-diazo-5-oxo-L-norleucine, a fine crystalline powder, and was later synthesized chemically. Although the culture filtrates themselves showed growth-inhibitory activity against a wide range of bacteria, fungi and viruses, the purified DON was active against only a few strains of bacteria and fungi and was completely inactive against eight viruses pathogenic for man, as well as against *Endamoeba histolytica*. However it was shown to inhibit markedly the growth of a form of cancer (sarcoma) in mice and several other transplantable neoplasms (tumours) in rodents. Because the drug was shown to be somewhat toxic, further experimental work was required to clarify its applicability to the treatment of cancer occurring in human beings.

Novobiocin.—This new broad-spectrum antibiotic was developed independently by three different research laboratories. It was formerly called streptonivcin and cathomycin. It was isolated from *Streptomyces niveus*, a new species of mould obtained from soil collected in New York. Chemically it was shown to be a dibasic acid entirely different from the previously known classes of useful antibiotics. In test tube cultures it inhibited growth of many Gram-positive and a few Gram-negative organisms; it proved particularly active against *Staphylococcus aureus* and *albus*, *Diplococcus pneumoniae*, *Streptococcus haemolyticus* and *viridans*, *Proteus vulgaris* and *Pasteurella multocida*. It was highly effective in protecting mice against experimental infections with *Staphylococcus aureus*, *Pasteurella multocida* and *Proteus vulgaris*. Various bacteria, especially the staphylococci, developed resistance to novobiocin, as to other antibiotics, but the organisms remained sensitive to other antibiotics. When it was given orally to human subjects and dogs in amounts that were anticipated to be in the therapeutic dosage range, unusually high and well-maintained blood serum levels of the antibiotic were attained. Peak levels occurred 2 to 4 hours after administration, but serum levels remained high for 24 hours. When injected subcutaneously or intramuscularly, it caused considerable local irritation in rabbits and cats, but no significant toxic effects were observed in dogs given the drug by mouth daily for two months. The drug was used in the treatment of human disease caused by staphylococci no longer sensitive to other antibiotics and in infections caused by novobiocin-sensitive organisms in patients who had proved allergic to other antibiotics. There were reports of leucopenia (reduction in the number of white blood cells) following its use.

Plant Oils as Antitubercular Agents.—Certain allium (garlic) bulbs had been shown to contain oils active against the tuberculosis bacillus. During 1956 other substances were isolated from plants growing in India which inhibited the growth of this organism in test tube tests. The volatile oil distilled from a creeping plant (*Tinospora cardifolia*) was particularly effective. Also active were a volatile oil obtained from *Occium canum*, an essential oil from betel leaves, and the active principle of an

edible vegetable (*Ammorphophalus campanulatus*). The latter two substances, however, were only one-tenth as active as the *Tinospora* oil.

Raisnomycin.—This antibiotic was isolated from a new species of soil mould, *Streptomyces kentuckensis*. Although it was isolated only in the impure form, it displayed three different active fractions. Its spectrum of activity against microorganisms differed from that of other known antibiotics; it was highly effective against test tube cultures of Gram-positive bacteria and equally effective against some of the Gram-negative group. It was ineffective against tuberculosis and brucellosis organisms and against the pathogenic (disease-causing) fungi. It was very active against organisms that developed resistance to erythromycin, tetracycline and streptothricin. Raisnomycin, in contrast with most broad-spectrum antibiotics, actually kills bacteria (bactericidal effect) instead of merely restraining their growth (bacteriostatic effect); sublethal concentrations failed to permit the development of resistant strains by any bacteria except *Staphylococcus aureus*, and this resistance occurred only after exposure for a month or longer.

Su 2434.—This compound (n-butyl-p-allyloxy-thionocarbaniolate) was studied for its activity against pinworms in mice. It was found particularly effective against these parasites and superior to the antibiotics, dyes and sulfonamides generally prescribed for human infestation.

(See also ALLERGY; BACTERIOLOGY; CANCER; PSYCHIATRY; VITAMINS AND NUTRITION.) (P. L. W.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Antibiotics* (1952).

Cherries: see FRUIT.

Chess. Arthur B. Bisguier of New York city, United States chess champion, won the 1956 open tournament of the United States Chess federation at Oklahoma City, Okla., in July. Bisguier finished with a count of $9\frac{1}{2}$ – $2\frac{1}{2}$, a score equalled by James T. Sherwin, another New Yorker, but the championship went to Bisguier under the median system of breaking a tie in chess. Robert Steinmeyer of St. Louis, Mo., finished third with a score of 9–3. Bobby Fischer, 13-year-old star from Brooklyn, N.Y., went unbeaten through 12 rounds to deadlock with four other players at $8\frac{1}{2}$ – $3\frac{1}{2}$. In the national speed championship, Sherwin tied with Anthony F. Saidy of Fordham university (N.Y., N.Y.), each scoring $9\frac{1}{2}$ – $1\frac{1}{2}$.

The national amateur tournament of the U.S. Chess federation was held at Asbury Park, N.J., in May and resulted in victory for John Hudson of Philadelphia, Pa., after Hudson, Harry Lyman of Dorchester, Mass., and John Norman Cotter of Harrington, Del., had tied for first with $4\frac{1}{2}$ – $\frac{1}{2}$. The median system of scoring gave the first award to Hudson. Mrs. Kathryn Slater of New York city won a prize for the best score made by a woman contestant and gained recognition as women's amateur champion.

In the United States junior tourney at Philadelphia, Pa., in July, Bobby Fischer triumphed with a final score of $8\frac{1}{2}$ – $1\frac{1}{2}$. The junior speed laurels went to Arthur Feuerstein of the Manhattan (N.Y.) Chess club. Feuerstein won with a score of $4\frac{1}{2}$ – $\frac{1}{2}$, Fischer placing second with a count of 4–1. The Tartakower memorial tournament, held at Detroit, Mich., in September, was won by Donald Byrne of Ann Arbor, Mich. The Michigan state titleholder went through undefeated for a score of $7\frac{1}{2}$ – $\frac{1}{2}$. Bisguier opposed Byrne in the final round but failed to stop him, the match ending in a perpetual check.

Vassily Smyslov, Russian grand master, triumphed in the world challengers' tourney at Amsterdam, Neth. Smyslov, with a final standing of $11\frac{1}{2}$ – $6\frac{1}{2}$, earned the right to oppose Mikhail Botvinnik of the Soviet Union for the world title Botvinnik had held since 1948. Soviet stars easily took team honours in an

international students' tournament at Uppsala, Swed. The winners took 21 games, lost 6 and adjourned 1. Russian masters captured the Hamilton-Russell trophy for the third straight time in September at Moscow. The Soviet team placed first in the event, which ran almost a month, with a score of 31–13. Hungary and Yugoslavia were next with $26\frac{1}{2}$ – $17\frac{1}{2}$.

Larry Evans of New York city triumphed in the first open championship of the Canadian Chess federation held at McGill university in Montreal. By drawing with James Sherwin in 96 moves in his last match, Evans finished with an 8–2 tally, a score matched by William Lombardy of New York city. Tie breaking calculations gave first prize to Evans. (T. V. H.)

Chicago. Second largest U.S. city, a port of entry and the county seat of Cook county, Ill., Chicago lies at the southwest corner of Lake Michigan. The city covers 213 sq.mi., and the metropolitan area encompasses 3,617 sq.mi. The city population in the 1950 census was 3,620,962, and that of the six-county Chicago metropolitan area was 5,495,364. It was estimated that the 1956 population was 3,900,000 in the city and 6,250,000 in the metropolitan area. The mayor in 1956 was Richard J. Daley (Dem.).

Employment in mid-1956 was up by about 80,000 persons over the 1955 average, and unemployment decreased by nearly 40,000 during the same period. Bank clearings for the first nine months of 1956 increased 8.8% to \$42,542,743,798 from \$39,091,674,134 in the same period of 1955. New investment in industrial plants in the Chicago metropolitan area for the first nine months of 1956 amounted to \$482,736,000, an increase of 89% over the \$255,470,000 recorded for the same period of 1955. The dollar volume of industrial production in 1956 was expected to exceed \$20,000,000,000, an all-time record, compared with a production volume of \$19,100,000,000 in 1955. Retail sales in 1956 were estimated at \$8,400,000,000 for the Chicago metropolitan area, approximately 5% more than in 1955.

Steel production in the Chicago metropolitan area in the first nine months of 1956 amounted to 14,847,200 tons, compared with 16,049,000 tons in the same period of 1955. This decline resulted from the nation-wide steel strike in July and August. It was estimated that production would approximate 20,000,000 tons for 1956, as against the record of 21,683,600 tons produced



FIRST FOREIGN SHIPS to be unloaded at Calumet harbour, Chicago, Ill. Opened in Sept. 1956, the new port facilities were built in anticipation of greatly increased international trade after completion of the enlargement of the St. Lawrence seaway.

in 1955.

Chicago continued to be the world's largest centre of rail and air traffic. Midway airport continued to be the world's busiest commercial airport, and the first of the permanent runways at O'Hare field, Chicago International airport, was opened in Sept. 1956. Passenger helicopter service was inaugurated toward the end of 1956 between Midway and O'Hare fields and the loop.

The total number of passengers carried by the Chicago Transit authority during the first seven months of 1956 was 361,275,387, a decline of 0.3% from the 362,400,404 carried during the same period of 1955.

All types of construction permits issued in the first eight months of 1956 increased to \$803,528,711 from \$711,512,832 in the first eight months of 1955, an increase of 13%.

School enrolment in Chicago in the fall of 1956, amounted to approximately 326,990 public and 177,579 Catholic elementary pupils, plus 93,221 public and 41,168 Catholic high school students. The total public assistance expenditures in Cook county for the first eight months of 1956 approximated \$57,592,161, an increase of 1.3% over the \$56,861,837 for the same period of 1955. A monthly average of 146,574 persons were receiving relief during the first eight months of 1956, which compared with 149,7796 persons in 1955.

The 1956 total appropriations for current operations of the governments that cover Chicago, in whole or in part, were: city of Chicago, \$559,000,000; Cook county, \$152,000,000; Cook county forest preserve district, \$7,000,000; Chicago board of education, \$206,000,000; Chicago sanitary district, \$51,000,000; Chicago park district, \$51,000,000; and mosquito abatement district, \$500,000, for a total of \$1,026,500,000.

The total 1955 property tax rate (tax paid in 1956) for the combined six taxing authorities in the city of Chicago was \$3.596 per \$100 of assessed valuation, for all of the city north of 87th street. The rate for the city south of 87th street was \$3.618, which includes the southern Cook county mosquito abatement district.

Total assessed real property valuation for 1955 taxes was \$9,532,892,723 within the city limits.

The general bonded debt, applicable to the city of Chicago, for the general obligations of these same six governments, as of Jan. 1, 1956, amounted to \$440,890,469. In addition, these six governments had outstanding \$180,073,000 in revenue bonds.

The 42-story Prudential Insurance company building was officially opened in Dec. 1955, and work continued on the new 19-story Inland Steel building. Other structures under construction in 1956 were a 14-story building for the America Fore Insurance group; a new 20-story Borg-Warner building; a building for the Morton Salt company; a 6-story Mutual Fund Life Insurance company building; and a new Chicago Sun-Times building.

During 1956 work continued on the \$350,000,000 accelerated expressway program, under which was being constructed a five-fingered radial expressway system from the central business district to outlying areas; the Congress Street superhighway was opened from Lakeshore drive to Laramie avenue, near the western city limits. Construction of the Northwest superhighway and the Calumet skyway continued, and it was hoped to complete the entire system by 1961.

The last of ten municipal parking facilities was completed by the city in 1956.

The Calumet-Sag channel widening project was well ahead of schedule. The Calumet-Sag channel, the new Chicago port and the St. Lawrence Seaway project were expected to revitalize Chicago's position in inland waterway shipping. (L. LN.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Illinois* (1955); *Middle States* (1955).

Child Labour. **United States.**—Employment of youth 14 through 17 years of age, according to U.S. bureau of the census figures, increased during the year ended June 1956 by about 350,000 over the previous year, maintaining an average of almost 2,500,000. This upswing, reflecting the improvement in general economic conditions, reversed the downward trend in youth employment that had been evident in 1954 and 1955.

In-school youth employed outside school hours accounted for most of this increase, continuing a pattern of youth employment that established itself during World War II. In 1946 approximately one-half of the 14 to 17-year age group who were employed were also enrolled in school; in 1951 the proportion in school was two-thirds; and in 1955 it was up to nearly three-fourths. Most of the employed students of these ages worked short hours—43% worked less than 15 hours a week; about 30% between 15 and 21 hours; and only 27% worked 22 hours or more. These high school boys and girls had jobs mainly in sales, service and on farms.

Although the unemployment rate among out-of-school youth 16 and 17 years of age decreased from 18% in Oct. 1954, to 15% in Oct. 1955, it was still much higher than the 3% rate for adults 20 years of age and over.

The high rate of unemployment among out-of-school youth was of considerable concern during 1956 to educators and welfare officials who were alarmed over the rising wave of juvenile delinquency. The senate subcommittee to investigate juvenile delinquency in its report released during the year urged that studies be made on the employment problems of youth, and that community programs be set up to help youth prepare for and find satisfactory employment.

A national movement to help youth obtain job experience and prepare for the full-time labour market after leaving school that gained momentum during the year was the summer job program. Under this program, local communities were encouraged to set up job programs for youth that would help them obtain suitable summer jobs. The U.S. department of labor, the National Child Labor committee, state employment service agencies and local community service organizations were among the groups working on the program during 1956.

In the field of child-labour standards, the secretary of labor issued a new hazardous occupations order under the Fair Labor Standards act. This order, Number 13, which became effective during 1956, set a minimum age of 18 years for employment in certain hazardous occupations in the manufacture of brick, tile and kindred products. The department concentrated its inspection activity under the act in the logging and sawmilling industries and in agriculture where violations continued to be high.

State Legislation.—During 1956, only a few states amended their child-labour or school-attendance laws. In Pennsylvania the amount of extra workmen's compensation benefits to be awarded to minors injured while illegally employed was raised from 10% to 50% and in New Jersey workmen's compensation coverage was extended to newsboys. On the other hand, newsboys who are independent contractors were removed from coverage under the Mississippi law.

In New Jersey, the child-labour law was amended to permit the limited employment of children in theatrical productions during the summer vacation. Virginia made a few changes in its child-labour and school-attendance laws including one which permits the employment of boys 14 rather than 16 and girls 16 rather than 18 in restaurants operated in connection with seasonal hotels. Judges of juvenile courts were authorized to grant, under certain circumstances, a special work permit to a child not qualified for a work permit under other provisions of the law, if it were deemed for the best interest of the child.

Mississippi repealed its compulsory school attendance law, and North Carolina and Louisiana enacted laws which affected the compulsory attendance of children in integrated schools.

New York and Massachusetts both extended for one year their act authorizing the relaxation, during emergencies, of certain labour laws for minors 16 and over.

Great Britain.—The Agriculture (Safety, Health and Welfare Provisions) act passed in 1956 contained two measures relating to the protection of young workers: (1) to prohibit children under 15 from working in agriculture; and (2) to prohibit children under 15 from riding on or driving vehicles, machinery or implements used in agriculture.

In Jan. 1956 the National Joint Advisory committee set up a committee to consider the training of young workers in industry in light of the expected increase in the number of young persons entering employment and the need to ensure an ample supply of trained workers for future needs. In 1955 almost 1,400,000 youth 15 to 17 years of age and more than 900,000 youth 18 and 19 years of age were employed, an increase of 33,000 over 1954.

International Labour Organization.—No conventions or recommendations dealing specifically with young workers were considered at the 1956 International Labour conference. Two ratifications of child-labour conventions were registered during the year: no. 5, 14-year minimum age for employment in industry, by India; and no. 58, 15-year minimum age for employment at sea, by Japan.

(See also CHLD WELFARE; MIGRATORY LABOUR.)

(E. S. J.)

Children's Books.

Beauty and delight as well as information were offered in the 1956 outpouring of books for children of the United States. Particularly gay and free were the illustrations in many of the new picture books. Luminous photographs of universally familiar objects against a French background made an unusual counting book, *1, 2, 3, 4, 5* by Robert Doisneau, with verses by Arthur Gregor. *What Does A Begin With?* by Nancy Dingman Watson reversed the usual alphabet presentation accompanied by realistically colourful New England scenes. Louis Slobodkin made clear with rhythm and colour that there may be *Millions and Millions* of other things, but "there's only one me and one you." Ylla's superb photographs for *The Little Elephant* by Arthur S. Gregor expressed perfectly the tenderness and humour of this little story. Vegetables were the most highly valued article in the fanciful land of Mandolia in *The Vegetabull* by Jan Le Witt, rich in colour and design. Sophistication and childlike quality mingled in *Jonah the Fisherman*, by Reiner Zimnik, translated by Richard and Clara Winston. Children gained some understanding of colour while they galloped through *The House of Four Seasons* by Roger Duvoisin.

Favourite picture book characters returned to delight children with new episodes. Babar, the elephant king, celebrated the founding of Celesteville with *Babar's Fair* by Laurent de Brunhoff. Virginia Kahl produced two rollicking picture books with a European flavour: *Maxie*, the story of an ingenious dachshund, and *Plum Pudding for Christmas*, which continued the adventures of characters introduced in *The Duchess Bakes a Cake* (1955).

Familiar characters in new settings were among the new picture story books. Bernadine Cook's *The Little Fish That Got Away* found her self-contained youngster (created in line drawings by Crockett Johnson) fishing with an unusual twist. *Mr. Penny's Race Horse* was a skilful mixing of slapstick with honest sentiment (Marie Hall Ets). Children welcomed William Pène Du Bois' highly humorous story of sky-dweller Artist Foreman and his animal factory creations in *Lion*. Author Eve Titus

and artist Paul Galdone created *Anatole*, the story of a French mouse who was an expert on cheeses, for the delight of young and old. In *The Littlest Mouse* Dorothy Lathrop expressed in text and illustration her rare feeling for nature and small, wild creatures.

The past provided the setting for several picture story publications. Illustrated by Marie Nonnast, *The Fourth of July Story* by Alice Dalgliesh continued her accounts of American holidays. Children enjoyed *Christmas on the "Mayflower,"* a story based on real happenings by Wilma Pitchford Hays (illustrated by Roger Duvoisin), and *The Pilgrim Goose*, four stories by Keith Robertson of the geese that came to America in the "Mayflower." *The Silver Mace* by Maud and Miska Petersham related vividly the rise and decline of Old Williamsburg.

Most, but not all, of the 27 tales in *The Little Bookroom* by Eleanor Farjeon had appeared elsewhere. This book received the Hans Christian Andersen medal, the first international children's book award, as well as the Carnegie medal. It is a distinguished book for family sharing illustrated by Edward Ardizzone. Eleanor Farjeon's magical way with words came into full play in her retelling of the most famous fairy tale of the western world, *The Glass Slipper*. Gravity did not exist in the world Palmer Brown fancied for Anna Lavinia in *The Silver Nutmeg*. *The Fairy Doll* (Rumer Godden), *The Enchanted Schoolhouse* (Ruth Sawyer), and *The Last Battle* (C. S. Lewis) represented expert mixture of fantasy and realism.

Families chuckled over the delightful animal characters in Ben Lucien Burman's *Seven Stars for Catfish Bend*, the very large, frustrated giant in Louis Slobodkin's *The Amiable Giant*, and the frustrated elephant in Alain's *The Elephant and the Flea*. *The Good Knight Ghost* by author-artist Jeanne Bendick provided hilarity in abundance.

Animal stories were plentiful. Established authors reappeared with new characters in *Cinnabar*, the *One O'Clock Fox* (Marguerite Henry), *Desert Dog* (Jim Kjelgaard), and *Pagoo* (Holling C. Holling) which told the life story of the hermit crab. Birds shared the spotlight in Thomas Liggett's *Pigeon, Fly Home* (carrier pigeons), and in John and Jean George's *Dipper of Copper Creek* nature was beautifully interpreted.

History for older boys and girls reached a high level in *The Story of the "Old Colony" of New Plymouth* by Samuel Eliot Morison. James Daugherty's *The Magna Charta* recreated an important period in England's history. Travel books lured readers: *At Home in India* by Cynthia Bowles told of her two years there, and *In France* by Marguerite Clément presented the great appeal and diversity of this land and people.

Fiction with an historical background appeared in several of the new publications. Isabelle Lawrence's *Niko: Sculptor's Apprentice* (ancient Greece), Helen Daringer's *The Golden Thorn* (Judea) and Gladys Malvern's *Saul's Daughter* successfully combined love and courage in an historical setting. Rosemary Sutcliffe's absorbing story, *Outcast*, was told against a Roman British background. Older readers enjoyed also the remarkable horse story by Jane and Paul Annixter, *The Runner*, a powerful adventure story by Richard Armstrong, *Cold Hazard* (shipwreck), and several fine offerings set in faraway places, *The Java Wreckmen* by Frank Crisp and *Castle on the Border* (Germany) by Margot Benary-Isbert. Marguerite De Angeli delighted readers again with her tale of adventure, *Black Fox of Lorne*.

Biographical highlights included an easy-reading colourful life story of Charles A. Lindbergh (*Ride on the Wind*) by Alice Dalgliesh, and a charming presentation of St. Valentine by Wilma Pitchford Hays (*The Story of Valentine*). *The Story of Eleanor Roosevelt* by Jeanette Eaton included her role in the United Nations. Mrs. Virginia S. Eifert's Young Lincoln trilogy was completed with the publication of *Out of the Wilderness: Young*



INNOCCHIO SHRINE at Ancona, It., which was unveiled in June 1956 honoring Collodi (Carlo Lorenzini), the author of the famous children's story. The statue was the creation of Emilio Greco, winner over 82 others in a sculpture competition

The Lincoln Grows Up. Abe Lincoln: Log Cabin to White House by Sterling North was an illuminating account of those years before his presidency when he was struggling to find himself.

Well-known nursery rhymes and jingles were set to music in a charming collection by Paul Kapp (*A Cat Came Fiddling*). A comprehensive collection of well-known poems was Herbert Read's *This Way, Delight*. A smaller, but attractive collection by Katherine McEwen (*Away We Go, 100 Poems for the Very Young*) was illustrated by Barbara Cooney.

Nature was not overlooked in the year's presentations. Vincent Brown's *How to Make a Miniature Zoo* was unique and ingenious. *Firefly* by Paul McCutcheon Sears and *See Through the Forest* by Millicent Selsam answered questions through beauty and delight for the younger reader. *The Story of Rocks* by Dorothy Shuttlesworth and illustrated by Su Zan N. Swain was handsome and inspiring, while *The Sea and Its Rivers* by Hilda Malkus and *The Story of Caves* by Dorothy Sterling aroused the curiosity of the older reader.

Outstanding among the year's crop of fact books were Keith Gordon Irwin's *The Romance of Writing: From Egyptian Hieroglyphics to Modern Letters, Numbers and Signs*, Rose Wyler and Gerald Ames's *The Story of the Ice Age*, George Barrow's *Our World in Motion*, Madeline Grant's *Wonder World of Microbes*, James Hemming's *Mankind Against the Killers*, Edward Stoddard's *The Story of Power*, Ronald Jessup's *The Wonderful World of Archaeology* and Louis Sutherland's *Magic Bullets: The Story of Man's Valiant Struggle Against Enemy Microbes*. In addition, many excellent examples of "how-to" books (Virginia Kirkus's *First Book of Gardening*) were pub-

lished in 1956.

Collections of stories were highlighted by Marchette Chute's excellent presentation for young people: *Stories From Shakespeare*. The Greek myths were presented for the adolescent reader in Aubrey De Sélincourt's *Odysseus the Wanderer*, and for the younger reader was Jane Werner Watson's *The Iliad and the Odyssey*, handsomely illustrated by Provenson. H. Herda's collection, *Fairy Tales from Many Lands*, came from Holland to delight all ages. Johanna Spyri's short stories were gathered together in *Pet Lamb, and Other Swiss Stories* offering quaintness with skill.

Attractive new editions of old favourites were welcomed. The increased tempo of established series publication and the mushrooming of several new series reflected the demand for selection guidance in this growing field of publication.

(See also BOOK PUBLISHING AND BOOK SALES; LITERARY PRIZES.) (S. Wr.)

Child Welfare. The most important developments in child welfare during 1956 could be only partially realized within the year. Freedom from the devastation of war in most parts of the world allowed long-range planning toward objectives which, until recent years, had seemed unattainable, planning which required legal and financial commitments without precedent. Consequently even though to many children the year may have brought none of the relief long desired, it was a year of promise.

International Services.—The children of Africa received more service from international efforts than in any previous year. The United Nations Children's fund, known as UNICEF, allocated 15% of its 1956 resources to projects in Africa (Asia 38%, the Americas 24%, eastern Mediterranean 10%, Europe 5%, emergencies 6%, interregional 2%). Only a few years previously the work of UNICEF and other specialized agencies had been concentrated in the more densely populated areas of Asia and in Latin America and the war-torn areas of the middle east and Europe.

The 1956 program of UNICEF devoted about half its services and resources to disease control (malaria 28%, yaws, 8%, leprosy 5%, trachoma 5%, tuberculosis 3%, other diseases 1%); maternal and child welfare services 26%; child nutrition 18%; emergencies 8%. Only ten years previously the work of this agency consisted mostly of relief, requiring millions of dollars for food and clothing, with little left for disease control.

Even if sufficient funds were available, any comprehensive development of child welfare services throughout the world would require years in which the personnel necessary to provide these services could be recruited and trained. UNICEF reported that in 30 of the countries aided there was not more than 1 physician to 10,000 persons. Many countries needing outside help had 3,000 persons or more to 1 physician, compared with ratios of 1 physician to 750 persons in the United States, 1 to 800 in New Zealand and 1 to 1,200 in France. In trying to meet this situation the World Health organization (WHO) invested large sums in the training of physicians, nurses and midwives.

In recent years WHO, UNICEF and Technical Assistance (TA) had combined efforts to carry public health education and services to the most distant and rural parts of the islands comprising the Republic of the Philippines. Radiating from the University of the Philippines and other training centres, with the Philippine government carrying its share, a network of health units was being organized. The country was divided into public health districts, each having one or more small hospitals. These districts were divided into several administrative units within each of which there were to be five to ten village health centres. Each of these local units was to have a graduate midwife in

charge, she being supervised and served by the public health physician in charge of the next higher administrative unit. By late 1956 about 2,000 midwives had been trained within this organization. The most promising of these were to be trained as "qualified midwives," with other better-qualified women being trained as nurses and nursing supervisors. Thus the rate of infant mortality was being reduced and the lives of many mothers saved who otherwise would have died in childbirth.

In Thailand a training course for mothers was conducted in a Buddhist temple.

The ninth World Health assembly, convened in May 1956 in Geneva, Switz., was informed that Iran had begun a seven-year health plan with the help of WHO, with \$75,000,000 allocated for this purpose by the Iranian government. As in the Philippines the heart of this program consisted of the training of personnel, including establishment of a school for sanitarians and several other schools for auxiliary workers. Sixty per cent of the funds voted by Iran were allocated for the eradication of communicable diseases, which in previous years had killed or handicapped large masses of children. At the WHO assembly it was reported that UNICEF was giving help to 282 programs in 95 countries and territories, with 213 of these programs being joint projects of UNICEF and WHO.

Canada.—Several provinces of Canada enacted laws in 1956 liberalizing their social security provisions affecting children. Deserted wives and children became entitled to support under a new Social Assistance act passed by the legislature of Nova Scotia. Mothers' allowances were increased in Ontario, and the age of child beneficiaries was raised in Saskatchewan. Increased appropriations for educational services for defective and retarded children were provided by many municipal and several provincial governments.

Adoption laws in Saskatchewan were revised to increase the rights of an adopted child, especially pertaining to inheritance. Attention was given throughout the country to hazards involved in interprovincial and international adoptions, and there was progress toward development of uniform provincial adoption procedures.

United States.—Desegregation in the public schools in several states where Negroes previously attended separate schools became generally effective in 1956. This was especially true in Kentucky, Maryland, Missouri, Tennessee and the District of Columbia. In some of the largest cities of those states, notably Louisville and St. Louis, municipal recreation facilities also were desegregated. In ten other states there was little or no progress toward desegregation. Mississippi and Virginia enacted laws contradictory to the supreme court ruling, and several other southern states for practical purposes discouraged all efforts to enrol Negro and white children in the same schools. White citizens' councils were widely organized and in some communities incited mobs to demonstrate their opposition to desegregation.

Adoption was a subject of concern to the senate subcommittee to investigate juvenile delinquency, which held hearings on commercial child adoption practices. These hearings revealed that in nearly half the states there was no criminal law against selling babies. Hearings in Miami, Fla., showed that in certain states and communities such deplorable practices had become common, with prospective adoptive parents paying as much as \$1,000 or \$1,500 for a child. The findings of this subcommittee led the U.S. senate in July 1956 to pass a bill protecting children, natural parents and adoptive parents involved in interstate placements for adoption, but the house of representatives took no action on the bill. The Child Welfare League of America and the U.S. children's bureau continued their efforts to unite welfare authorities, private agencies and professional workers

engaged in adoption services in efforts to improve these services and take steps toward outlawing black market adoption practices in all parts of the country.

Juvenile delinquency, as measured by police and juvenile court statistics, increased during 1956. Arrests of offenders under 18 years of age increased 11.4%. Overloaded juvenile courts and overcrowded detention homes were handicaps common in urban communities. For years such factors had led many mildly delinquent young persons to become more delinquent while being held for court appearance. After detention many found themselves in the hands of judges and probation officers too busy and too unprepared for their work to permit them to provide the counsel and supervision needed.

The U.S. senate subcommittee to investigate juvenile delinquency found the territory of Alaska entirely without a juvenile probation staff. The hearings of this subcommittee, published in 1956, revealed that there was only one probation officer in the territory, whose duties within a U.S. district made him available mostly to adult offenders and only to those juveniles coming into federal courts on felony charges. Juvenile delinquency in Alaska had increased notably during the preceding five years, with almost no development of facilities for the prevention, care, treatment or rehabilitation of juvenile delinquents. In New York city and several other metropolitan areas juvenile gangs were responding to preventive efforts being made by detached social workers, men who worked with the gangs in their natural settings.

Pres. Dwight D. Eisenhower called a Conference on Fitness of American Youth, held in June 1956 in Annapolis, Md. Within his cabinet he established the President's Council on Youth Fitness, designed to co-ordinate, stimulate and improve the work of 35 federal agencies. He also appointed a Citizens Advisory Committee on the Fitness of American Youth.

Among more favourable developments was amendment of the federal Social Security act in July 1956, providing extended coverage of old-age and survivors' insurance, whereby about 850,000 persons (many of them children) were assured financial benefits. Anyone totally disabled before age 18 would receive benefits as long as he was totally disabled. During the first year this would add about 20,000 children to the social security rolls. School lunch appropriations were increased by more than 20% for the fiscal year 1956-57 by congressional action in June 1956.

(See also CHILD LABOUR; INFANT MORTALITY; JUVENILE DELINQUENCY; MIGRATORY LABOUR; RED CROSS; SOCIAL SECURITY; TUBERCULOSIS; WORLD HEALTH ORGANIZATION.)

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ENCYCLOPÆDIA BRITANNICA FILMS.—*Food and People* (1956); *Mental Health* (1952); *Schoolhouse in the Red* (1949).

Chile. A republic extending along the southern Pacific coast of South America for about 2,600 mi., Chile has an average width of 110 mi. It is bounded on the north by Peru, on the south by the Antarctic ocean, on the east by Bolivia and Argentina and on the west by the Pacific ocean. It has an area of 286,396 sq.mi. and a population (April 1952 census) of 5,930,809; (1955 est.) 6,855,000. Santiago, the capital, including suburbs, has 1,348,283 inhabitants (April 1952 census). Other leading cities of more than 50,000 are Valparaíso, 218,829 inhabitants; Viña del Mar, 85,281; Concepción, 119,887; Antofagasta, 62,272; Talca, 55,059; Temuco, 51,497; Chillán, 52,576; Talcahuano, 54,782. Religion: Christian, mainly Roman Catholic. President in 1956: Gen. Carlos Ibáñez del Campo.

History.—Pres. Carlos Ibáñez del Campo sponsored a national economic recovery program which checked inflation during 1956, but aroused opposition on the part of leftist groups. The core of Ibáñez' program was a law enacted in January which froze prices at the level prevailing on Nov. 16, 1955, and forbade revision of wages and salaries by more than 50% of the rate of increase in the cost of living during 1956. In the first six months of 1956 the rate of increase in the cost of living was less than a third of that for the corresponding period in 1955, and by July the peso was fairly stable at 495 to the U.S. dollar. Other reforms included abolition of the complex system of official exchange rates, reduction of government expenditures and a ban on luxury imports. Stabilization was assisted by a \$75,000,000 loan from the International Monetary fund, the U.S. treasury and eight U.S. banks.

Efforts of the illegal but powerful Central Labour organization (Confederación Unica de Trabajadores Chilenos) to block passage of the law establishing price and wage ceilings were thwarted by the government. On several occasions the government took decisive action to prevent or terminate strikes which were adjudged illegal. Nevertheless, a September work stoppage by bank employees lasted ten days, and a strike by nitrate workers persisted for three months before settlement was reached. A six-month state of siege (martial law and suspension of civil liberties) was finally imposed in the northern provinces of Antofagasta and Tarapacá.

Chile's deflationary measures, relatively firm labour policy and recent (1955) tax concessions attracted substantial foreign investment capital to the copper, nitrate, steel and petroleum industries. Outstanding projects were initiated in the copper industry, which enjoyed an excellent year because of a world shortage of that metal.

Political opposition to President Ibáñez' economic reforms and his encouragement of foreign capital crystallized in a Communist-inspired coalition of Socialists and other leftist groups. This popular front movement scored important victories in the April by-elections, but lost ground when the government launched an anti-Communist campaign in May. Rumours of a revolutionary plot instigated by former dictator Juan Perón of Argentina placed Chile's armed forces on alert in June. The Radical party was accused of complicity, and the chamber of deputies later censured President Ibáñez for "not having taken measures against Peronista infiltration in Chile." Ibáñez was attending the Panamá conference of American presidents at the time he was censured. The president sought to obtain more solid backing in Congress by appointing members of the Agrarian Labour party to his cabinet in August.

The senate ratified a treaty with Bolivia providing for the construction of a pipeline from the Bolivian oil fields in the Llaco to the Chilean port of Arica. At international meetings in Mexico City and in Ciudad Trujillo, Chile reasserted its claim of jurisdiction over its coastal waters to the 200-mi. limit. A navigation act was passed in June, requiring that half Chile's international cargoes and all its coastwise shipping be carried on Chilean vessels. Supporters of President Ibáñez felt that the law would make effective service impossible, and leading maritime powers objected vigorously.

(See FOREIGN INVESTMENTS.)

Education.—In 1953, 6,851 primary schools and kindergartens had an enrolment of 819,403 pupils; 332 secondary schools (1952) had 86,652 pupils. University education was available at the state university of Chile (14,511 students in 1951), the Catholic university of Santiago (1,751 students), the University of Concepción (1,419 students) and the Catholic university of Valparaíso (637 students). Public education was scheduled to receive 17.5% of government expenditure in 1956.

Finance.—The monetary unit is the peso with a par value of 0.91 cents U.S. currency. Under the free exchange system inaugurated April 20, 1956, the peso was valued on July 31, 1956, at 0.20 cents, bankers' free rate applicable to permissible imports, authorized nontrade remittances and governmental and semigovernmental transactions) and at 0.19 cents,

brokers' free rate. The 1956 budget, as approved by congress in Dec. 1955, estimated revenue at 170,412,707,620 pesos and expenditure at 170,411,045,020 pesos. In 1955 revenue was 137,935,600,000 pesos and expenditure, 156,019,600,000 pesos. The funded external debt on Dec. 31, 1953, was £17,440,974, \$106,595,500 and 85,832,400 Swiss francs; the direct internal debt (Dec. 31, 1954), 18,988,100,000 pesos. Currency in circulation (May 31, 1956) totalled 46,440,000,000 pesos; demand deposits, 105,770,000,000 pesos. The U.S. department of commerce estimated U.S. direct private investments in 1955 at \$636,000,000, of which mining and smelting investments accounted for \$404,000,000. The cost-of-living index (Santiago) stood at 448 in May 1956 (1953=100).

Trade and Communications.—Exports in 1955 amounted to \$474,681,000; imports, \$376,326,000. Leading exports were copper (65%), nitrate of soda (11%), timber (3%) and metallurgical products (2%); leading imports, industrial oils, chemicals and paints (17%), machinery (15%), transport materials (14%), petroleum and products (12%) and sugar (6%). Chief customers were the U.S. (42%), the United Kingdom (17%), Germany (10%), Argentina (10%) and Italy (6%); chief suppliers, the U.S. (43%), Germany (11%), Argentina (11%), Peru (8%) and the U.K. (6%).

The railway system totalled 5,284 mi. in 1950, of which 3,899 mi. were owned by the government. In 1954 there were 30,203 mi. of highways, of which 10,895 mi. were surfaced. On Jan. 1, 1955, there were 45,882 automobiles, 38,565 trucks and 4,951 buses. According to *Lloyd's Register of Shipping*, the merchant marine had 101 vessels (100 tons and over) aggregating 229,774 gross tons on June 30, 1955. Telephones (Jan. 1, 1955) numbered 148,239, 57% of which were located in Santiago.

Agriculture.—Production of the principal crops in the crop year 1955-56 was estimated as follows (in metric tons): wheat 1,031,000; barley 100,000; oats 107,000; rice (paddy) 79,000; maize 107,000; potatoes 637,000. Livestock estimates included cattle (1954) 2,363,700, pigs (1955) 723,000, sheep (1953) 6,500,000, goats (1951) 830,000, horses (1951) 600,000. Wool production in 1955 (clean basis) was estimated at 9,000 metric tons.

Manufactures.—In 1950 there were 5,048 manufacturing establishments with 190,000 employees and gross value of production totalling 43,629,000,000 pesos. Production estimates (1955) included steel 319,000 metric tons; pig iron 256,000 tons; rolled steel products 240,000 tons; wheat flour 720,000 tons; cement 801,000 tons; woven cotton fabrics, about 52,500,000 yd.; paper 52,000 tons; sulphuric acid 27,000 tons; manufactured gas 150,000,000 cu.m.; refined petroleum products 4,780,000 bbl. Installed electric energy capacity (Dec. 1955) totalled 958,000 kw.; production in 1955 (for public use only) was 2,280,000,000 kw.hr. The index for manufacturing industries averaged 104 in 1954 and 100 in 1955 (1953=100).

Minerals.—Production in 1955 included copper 433,570 metric tons; nitrate of soda 1,540,219 tons; iodine 1,114 tons; iron ore (metal content 60%) 1,523,229 tons (exports 1,236,648 tons); coal 2,308,073 tons; silver 1,714,495 fine oz.; gold 122,877 oz. Petroleum production on Tierra del Fuego totalled 409,680 cu.m. (about 2,577,000 bbl.); imports included 2,200,000 bbl. of crude petroleum and 8,490,000 bbl. of refined petroleum products. Annual refining capacity in 1955 was 7,400,000 bbl.

(J. W. Mw.)
ENCYCLOPEDIA BRITANNICA FILMS.—Chile (1940); Chile (people of the country estates) (1955).

China. China borders Korea, the U.S.S.R., Outer Mongolia, Afghanistan, India, Nepal, Bhutan, Burma, Vietnam, Laos and the Pacific ocean. The area is approximately 3,911,209 sq.mi. including Manchuria, Sinkiang, Tibet and Formosa. Population statistics vary. The last Nationalist figure in June 1948 gave the total as 463,493,418 while in Nov. 1954 the Peking government announced that the total population, as of June 30, 1953, was 601,938,035, including more than 19,000,000 outside the mainland. Politically the country remained divided in 1956 into: (1) the People's Republic of China on the mainland plus Hainan and other islands, under the Central People's government in Peking with Mao Tse-tung as its chairman; (2) the Republic of China on Formosa and the Pescadores plus some offshore islands, under the Nationalist government in Taipei with Chiang Kai-shek as its president.

According to Peking's administrative system, China mainland was divided into 22 ordinary provinces plus the autonomies of Inner Mongolia, Tibet and Sinkiang-Uighur region. Peking, Tientsin and Shanghai, the three largest municipalities, remained under the direct administration of the Central People's government. In 1955 ten cities had more than 1,000,000 population: Shanghai, 6,204,417; Peking, 2,758,417; Tientsin, 2,693,831; Mukden, 2,213,000; Chungking, 1,620,000; Canton, 1,600,000; Wuhan (Hankow and Wuchang), 1,500,000; Harbin, 1,200,000; Port Arthur-Dairen, 1,200,000; Nanking, 1,000,000.

History.—During 1956 the foreign policy statements of the People's Republic of China laid emphasis on peaceful coexistence, peaceful liberation of Formosa, denunciation of colonialism and closer ties with Asian-African countries, with the central objective of winning greater recognition and respectability as a

great power and the sole government of China. In domestic affairs there were signs of relaxation in control and promises of greater improvements in living conditions. All these gave an outward manifestation of unity and of co-operation with the Soviet policy of peaceful coexistence and the new concept of nonviolent revolution proclaimed by the Russian leader, Nikita S. Khrushchev.

While Moscow and Peking continued to strengthen their relations, the posthumous purge of Stalin by the present Soviet leaders presented an embarrassing and delicate situation to the Chinese Communists, who had regarded Stalin as the greatest leader and teacher of world Communism, and Mao Tse-tung as the true disciple of Marx and Lenin and the indispensable leader in the Communist movement in China. In denouncing Stalin, Khrushchev stated that by treating China as an inferior Stalin almost drove Mao to break with the Soviet Union, had it not been for the United States hard policy toward mainland China. Peking's reaction to all these pronouncements appeared to be cautious, and it maintained a relative but meaningful silence on the denunciation of Stalin. Opening the first congress of the Chinese Communist party in 11 years on Sept. 15, 1956, Mao made no mention of the controversy on Stalin, and gave fervent support to the Soviet Union as China's great teacher. Soviet Deputy Premier Anastas I. Mikoyan, in a speech at the congress, dealt with the "cult of personality" but praised Mao as a true Marxist and Leninist. Mikoyan reaffirmed the close friendship between the two countries in emphatic terms, and pledged greater aid to mainland China.

Since the seventh Chinese Communist Party congress met in 1945, its membership had grown from less than 1,000,000 to more than 10,700,000. With the purge of Kao Kang and his followers in 1955, Mao's leadership in the party as well as in the government had been without any open opposition. Significant statements by the party leaders at the congress indicating the lines of future policy may be summarized as follows: (1) to further develop friendship and co-operation with "fraternal countries

in the camp of Socialism" on the one hand and to frustrate "completely the scheme of imperialists to create tension" on the other; (2) to establish diplomatic relations with all countries willing to live peacefully with the Chinese People's government; (3) to liberate Formosa by peaceful means; (4) to give active support to the national independence movement in Asia, Africa and Latin America; (5) to support "the entirely lawful action of the government of Egypt in taking back the Suez Canal company" and resolutely to oppose any attempt to start armed intervention against that country; (6) to continue to strengthen national defense and unity between the party and the people; (7) to further develop industries and agriculture by introducing a second five-year plan beginning in 1958.

Another important political development on mainland China during 1956 was the convocation in June of the third session of the First National People's congress consisting of 1,200 deputies, the proceedings of which reflected the new mood of "liberalization" in Communist countries.

The most significant pronouncement made at the session was perhaps the open invitation by Premier Chou En-lai to the Nationalist government in Formosa to conduct peace talks. He offered "amnesty terms to those on Taiwan who might be willing to take the road to peaceful liberation" and jobs and rewards for "meritorious services" in the "peaceful liberation." Chou's declaration was immediately rejected by the spokesmen of the Nationalist government.

Peking's invitation to the Nationalists to peace negotiations appeared to be a corollary of the talks in Geneva, Switz., between the Chinese and United States ambassadors, which entered their second year in Aug. 1956. The talks were held (1) to settle the question of repatriation of civilians and (2) to discuss practical matters at issue between Peking and Washington. From the beginning the Nationalists viewed the Geneva talks with apprehension and pleaded with the United States for their termination. By the end of 1955 the Geneva conference had not been able to dispose entirely of its first agenda item. While Washington insisted on the release of all U.S. civilians on mainland China before other matters could be discussed, Peking requested that the talks be moved to the level of foreign ministers in order

to bring about a quicker settlement on trade embargo and the question of Formosa. As neither side wished to be blamed for a breakdown, the Geneva talks continued to take up both items on the agenda simultaneously.

The negotiations in Geneva had been more or less secret, and only when they reached an impasse were independent statements issued by both sides explaining their positions. From the official statements published in January and June, it could be seen that the basic difficulty was the impossibility in reaching any agreement on the status of Formosa and the Nationalist government. While the United States was ready to renounce the use of force, except defensively, in the Formosa area, Communist China, regarding Formosa as a part of its territory, was not prepared to do so.

CHINA 1956, showing provincial capitals and boundary changes. The cities of Peking, Tientsin and Shanghai were administered directly by the central government of the People's Republic of China





PEKING PROCESSION celebrating the decision of a wealthy Chinese citizen to share his money with the Communist government. The photograph was taken in 1956 by an Egyptian photographer, one of the first persons of a non-Communist state permitted to take pictures freely in China

this stalemate Premier Chou's invitation to Taipei to send a peace negotiation team to Peking was interpreted as merely marking time as Peking did not want to break off talks with the United States.

The uneasy relations between Washington and Peking was aggravated by the shooting down of a U.S. navy plane off the China coast by the Chinese Communists on Aug. 22. The United States strongly protested the attack and asked compensation for the plane and its 16 crewmen. In a reply on Sept. 2 Peking, admitting the incident, rejected U.S. demands for compensation but in turn demanded that "the United States stop its provocative activities." On Sept. 24 the state department in a public reply to Peking's August proposal of abolishing trade restrictions declared that the United States would not discuss this matter so long as the Chinese Communists held Americans in prison and refused to renounce the use of force in the Formosa area.

In January a three-day conference in Washington, D.C., between Pres. Dwight D. Eisenhower and British Prime Minister Anthony Eden touched on the question of trade embargo and China's representation in the United Nations. However, the Eisenhower-Eden joint statement of Feb. 1 disclosed no change in the U.S. position on admission of Communist China into the United Nations but gave indications of the United States' willingness to consider the United Kingdom's proposal for relaxing the embargo.

Concerning the question of Formosa and China's representation in the United Nations, the United States continued its support of the Nationalist government position. On March 16 Secretary of State John Foster Dulles declared in Taipei that the United States had consistently recognized and supported the government of the Republic of China as the only government of China. In early July Vice-Pres. Richard M. Nixon delivered in person Eisenhower's letter to Chiang Kai-shek reaffirming the support of the United States government for the Republic of

China. On July 23 the United States congress declared itself in a concurrent resolution as being unequivocally against the seating of Communist China in the United Nations. In this resolution congress expressed its conviction that admission of "the Communist regime in China would thereby injure the United Nations and its effective functions in accordance with the aims, principles, and provision of the United Nations Charter." Subsequently both the Democratic and Republican party platforms for the 1956 elections contained a plank opposing the seating of Communist China in the United Nations.

Prior to the 1955 general assembly only 17 of the 60 member countries of the United Nations had recognized Communist China. With the admission in Dec. 1955 of 16 new members, 8 of whom had diplomatic relations with Peking, the position of the Nationalist government in the United Nations became more difficult.

In September, a new treaty between Nepal and Communist China was concluded recognizing Peking's sovereignty in Tibet. During his visit to Peking in early October, Pres. Achmed Sukarno of Indonesia pledged support of Peking's task of "liberating" Formosa.

(See also FORMOSA; UNION OF SOVIET SOCIALIST REPUBLICS.)

Education.—Official round figures show an appreciable increase in the 1956 total enrolment in all levels of education on the mainland: primary schools, 62,000,000, an increase of 9,000,000 over 1953; secondary schools, 5,000,000, an increase of 2,000,000 over 1953; higher education, 380,000 as against 220,000 in 1953. A teacher shortage confronted the educational expansion program. For 1956 and 1957 an additional 80,000 secondary and 200,000 primary teachers were needed.

Defense.—In 1956 the regular army was estimated at 2,700,000. With an estimate of about 2,000 planes, including Russian-made jets and bombers, Communist China was no longer a country with a weak air force.

The Nationalist armed forces were estimated at 600,000 men including navy, air force and miscellaneous units. Under the Chinese-U.S. agreement of 1955, a systematic reserve training program began in March 1956 to

train nine reserve divisions as an auxiliary force to the regular army. In July it was announced that to strengthen the Nationalist air force, estimated at 500 planes, more jets would be provided under the United States military aid program.

Finance.—The currency on mainland China is a new Yuan introduced in 1955. The official rate of exchange was maintained at U.S. \$1 = 2.355 Yuan and £1 sterling = 6.86 Yuan. The 1956 budget, as presented to the third session of the People's congress in June 1956, proposed a total expenditure of 30,742,770,000 Yuan (about U.S. \$12,300,000,000), which would be met by a total revenue of 29,731,732,000 Yuan plus a balance credit of 1,011,038,000 Yuan. Final accounts for 1955 showed a total revenue of 30,357,976,000 Yuan (U.S. \$12,100,000,000), 3,154,657,000 Yuan of these representing the balance credit, and expenditures of 29,346,938,000 Yuan (U.S. \$11,700,000,000). Economic construction and national defense accounted for 46.89% and 22.15%, respectively, of the 1955 total expenditure; 52.22% and 19.98%, respectively, of the 1956 estimated budget would go to economic construction and national defense; 48.19% and 47.02%, respectively, of the 1956 revenue would come from state enterprises and taxation.

Trade and Communications.—During 1955 and 1956, more than 80% of Peking's foreign trade was with the Soviet Union and other Communist countries, and attempts were made to bargain for more trade with the west. Imports and exports were regulated to meet the requirements of the first five-year plan 1953-57, and the major portion of the imports were for production purposes. In addition to the traditional exports of raw materials, various products of light industries were exported during the year.

Under the five-year plan 1953-57, about 2,538 mi. of new trunk and branch railway lines and more than 6,210 mi. of highways were to be built. During the first six months of 1956, more than 310 mi. of railway were laid in addition to about 1,640 mi. built between 1953 and 1955. Only about 500 mi. remained to be built to complete the quota under the five-year plan according to the official report. The Chinese section of the Tsinghai-Bator railway, which was to shorten the distance between Peking and Moscow by 600 mi., was completed in 1955. Other railway projects of strategic importance under construction were the Lanchow-Sinkiang railway which would eventually link northwest China with Soviet central Asia, and the Yingtan-Amoy railway connecting the existing Chekiang-Kiangsi railway with Amoy opposite Nationalist-held Quemoy Island. Between 1953 and 1955 about 5,525 mi. of highways were completed, and another 2,865 mi. were being built during 1956.

China: 1957 Goals and Estimated Output of Certain Basic Industrial and Agricultural Products

Item	1952	1954	1955	1957
Coal	63,530	81,990	94,043	113,000
Steel	1,350	2,170	2,567	4,120
Electricity (million kw.hr.)	7,260	...	...	15,920
Crude oil	320	...	...	1,500
Machine-made paper	370	480	523	650
Grains	164,000	170,000	178,000	193,000
Cotton	1,304	1,092	1,317	1,635

Agricultural and Industrial Production.—The chief aim of the first five-year plan was socialist transformation of agriculture and the building of a preliminary foundation for socialist industrialization. The plan called for a total outlay of 76,640,000,000 Yuan (U.S. \$32,337,552,000), of which 42,740,000,000 Yuan (U.S. \$18,033,756,000), or more than 55%, were earmarked for investment in capital construction of about 1,600 major projects. Of these 455 were in industry, and prior to 1956 the Soviet Union had agreed to supply equipment for 156 of these industrial projects under the five-year plan. The value of Soviet aid for the 156 projects was estimated at 5,600,000,000 roubles (U.S. \$1,400,000,000) by Nikita S. Khrushchev. In April 1956 Moscow agreed to provide equipment and technical assistance to 55 more projects, including the building of the Lanchow-Urumchi-Alma-Ata railway. The five-year plan stipulated that the total output of industry in 1957 was to reach 53,560,000,000 Yuan. In June the chairman of the planning commission reported to the People's congress that in 1955 the actual industrial output had reached 44,750,000,000 Yuan; and that it would reach 53,580,000,000 Yuan toward the end of 1956, thus attaining the industrial output target one year ahead of schedule.

Although less than 8% of the total capital investment under the five-year plan was earmarked for agriculture, the collectivization of agriculture was rapid. According to the official report, about 110,000,000 peasant families had become members of some sort of co-operative, and 56% of them were members of Soviet-style collective farms in March 1956. Collectivization was an integral part of the five-year plan to increase agricultural production, and the 1957 target for grain production was 192,800,000 metric tons, or a 17.6% increase over 1952. The official figures for grain production for the past three years were: 167,000,000 tons in 1953; 170,000,000 tons in 1954; and 178,000,000 tons in 1955.

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Chiropractic. Chiropractic is a science based on the premise that malfunction and disease often result from lack of normal nerve function. The doctor of chiropractic, by general manipulation and specific adjustment of the structures of the body and the use of clinical nutrition, physiotherapy and psychotherapy, as indicated, seeks to restore normal nerve function, thereby enabling the protective and restorative powers

of the body to function normally.

The 61st anniversary convention of the National Chiropractic association was held in Chicago, Ill., July 1-6, 1956. High-lighting the convention agenda was a series of scientific symposia covering important developments in diagnostic procedure, adjusting technique, X-ray interpretation, poliomyelitis, physiotherapeutic practices and public health problems. Minimum standards of four academic years, totalling 4,000 hours, are required in the eight nonprofit colleges accredited by the National Council on Education. Twenty-two states now require two years pre-professional training, in addition to the four-year professional course, before licensure.

The 1957 convention was to be held at the Ambassador hotel in Los Angeles, Calif., July 14-19, 1957.

The Public Affairs institute of Washington, D.C., published an appraisal of the healing arts, titled *Health Service Is a Basic Right of All the People*, and a study of the chiropractic profession, *The Present Day Doctor of Chiropractic*, both of which received wide distribution.

Important activities during 1956 included: (1) a Public Relations conference in Memphis, Tenn., Jan. 22-23, which resulted in nation-wide sponsorship of Correct Posture week, May 1-7, and Chiropractic day, Sept. 18, by the chiropractic profession; (2) establishment of scholarships in each of the National Chiropractic association accredited colleges; (3) creation of a series of sound, colour films for television showing; (4) plans for a series of health columns to appear in small daily and weekly newspapers throughout the United States; (5) educational exhibits at the conventions of the American Association of Junior colleges and the American Personnel and Guidance association.

Official publications are *Healthways Magazine*; the *Journal of the National Chiropractic Association*; *Chiropractic News*; *Chiropractic—A Career*. Headquarters: National building, Webster City, Ia. (L. M. R.)

Christian Science. Growing interest in spiritual healing was reported by a number of departments of the Mother Church, the First Church of Christ, Scientist, in Boston, Mass., during 1956. More than \$250,000 was expended during the year to provide for the physical, mental, moral and spiritual welfare of those in the armed forces interested in Christian Science. Progress of the denomination's healing and redemptive work was reflected in testimonies published regularly in the *Christian Science Journal*, the *Christian Science Sentinel* and the *Heralds of Christian Science* in various editions. They included healings of cancer, tuberculosis, paralysis, deafness, carious bones, physical deformity and many other serious conditions.

It was reported that there was increasing recognition of Christian Science care in major medical, health and accident, automobile medical expense and other casualty insurance policies.

A marked increase in sales of the Christian Science textbook, *Science and Health with Key to the Scriptures* by Mary Baker Eddy, the discoverer and founder of Christian Science, was announced by the trustees under her will.

Gratifying response from the television and radio series "How Christian Science Heals" was also noted. Increased church and lecture attendance, as well as increased use of Christian Science reading rooms, were reported. More than 200 television stations in the United States and Canada carried the filmed Christian Science programs during the year.

In addition, more than 800 radio stations also carried the series which featured accounts of spiritual healing told by those who actually experienced them.

A special 50-minute film called *The Earth Shall Be Filled* was

released for distribution in the 48 countries in which the Mother Church had branches. The film featured three of the "How Christian Science Heals" programs and background information about the television series.

Among the new branches of the Church added during the year were those in Miranda, Austr.; Barnstaple and Sidmouth, Devonshire, Eng.; Dortmund and Trier, Ger.; Helsinki, Fin.; Asan Point, Guam; and Vlaardingen, Neth.

Progress in the activities of the *Christian Science Monitor*, the denomination's international daily newspaper, was reported. The series "Today's Great Issues and the Bible Answers" met with substantial response from readers. Advertising lineage reached a total of 8,689,016 lines, the highest in *Monitor* history.

During the year, 15 Christian Science chaplains were on active duty with the United States army, navy and air force.

(W. B. Ds.)

Christian Unity. An active interest in church union found expression in 1956 in concrete proposals and negotiations in three different continents.

North America.—The union of the Congregational Christian Churches and the Evangelical and Reformed Church in the United Church of Christ" was scheduled for June 25, 1957, when the constitution of the new body was to be adopted. The basis of union between the two bodies was approved by the Evangelical and Reformed Church in 1947 and by the Congregational Christian Church in 1948. The united body would have a membership of more than 2,000,000.

At the International Convention of the Disciples of Christ held in Des Moines, Ia., Sept. 28-Oct. 3, 1956, authorization was given to explore the possibility of its joining with the Congregational Christian Church and the Evangelical and Reformed Church in the formation of this "United Church of Christ." If this should happen, the resulting body would have a membership of approximately 4,000,000.

The merger of three Lutheran bodies, the American Lutheran Church, the Evangelical Lutheran Church and the United Evangelical Lutheran Church, was scheduled for 1960. The Lutheran Free Church, which had been a participant in the negotiations in the earlier stages, did not secure the necessary vote of three-quarters of its local congregations when the proposal was submitted to them in a referendum in 1956. Another Lutheran body, however, the Finnish Evangelical Lutheran Church, in June 1956 authorized its Commission on Inter-Synodical Affairs to investigate and report on the wisdom of its joining with the three Lutheran bodies which were already committed to the union.

Two other large Lutheran bodies, the United Lutheran Church in America and the Augustana Lutheran Church, jointly invited other Lutheran bodies in America to enter into discussions concerning an inclusive Lutheran union. In his address as president of the United Lutheran Church, at its biennial convention held in Harrisburg, Pa., in Oct. 1956, Franklin Clark Fry emphasized church unity.

The Presbyterian Church in the U.S.A. and the United Presbyterian Church of North America, in their general assemblies in May and June 1956, approved a plan of union for the two denominations in a new body to be known as the United Presbyterian Church in the U.S.A. Before the plan became effective, however, it had to be approved by two-thirds of the presbyteries of both bodies. The vote by presbyteries was being taken during 1956-57. The plan of union followed the general line which was earlier proposed for a three-way union, including the Presbyterian Church in the U.S. (southern), which, however, had rejected the proposal in 1955.

The American Unitarian association, at its annual meeting in Boston, Mass., in May, created a commission to study the pos-

sibility of merger with the Universalist Church of America. These two denominations had already federated their departments of education and, in part, their departments of public relations and publications. The commission created by the Unitarians was instructed to report whether the present federated arrangement should be continued or whether complete union should be sought.

In Canada union negotiations between the United Church of Canada and the Anglican Church of Canada, quiescent for several years, received a new impetus in 1956. The General council of the United Church of Canada and the Executive council of the Anglican Church in Canada both voted to continue negotiations and to open the way for other Canadian bodies to join in the discussions.

A national study conference on "The Nature of the Unity We Seek," to be held on the campus of Oberlin college, Oberlin, O., Sept. 3-10, 1957, was announced by the U.S. Conference for the World Council of Churches, the National Council of Churches and the Canadian Council of Churches. Sixteen regional study groups in different parts of the country were carrying on preparatory discussions and studies. About 40 different denominations were in the process of appointing delegates to the Oberlin conference, the purpose of which was defined as the seeking of answers to fundamental questions which underlie any successful plan of church union.

Europe.—In Great Britain discussions on the establishment of intercommunion proceeded in 1956 in two groups. The first included the Church of England and the Methodist Church; the second, the Church of England and the Presbyterians. In the latter case, the Presbyterians included both the Church of Scotland and the Presbyterian Church of England; and on the Anglican side, the Episcopal Church of Scotland was participating as well as the Church of England. The central interest in British discussions dealt with the possibility of an agreement which would effect intercommunion, rather than union in a single ecclesiastical body.

In the Netherlands the question of intercommunion was also prominent. On May 30, 1956, the synod of the Evangelical Lutheran Church decided to accept an agreement with the Netherlands Reformed Church on Holy Communion. This was the outcome of the work of a commission of theologians which was appointed to examine the differences in the doctrine of Holy Communion between the Reformed and the Lutheran branches of Protestantism. The commission drew up a "Consensus on Holy Communion" and made proposals for the interchange of pulpits and intercommunion. The General synod of the Reformed Church accepted the proposal on Feb. 2, 1956. The subsequent action of the Evangelical Lutheran Church made it possible for ministers of either church to celebrate Holy Communion in the other. It did not involve a merger of the two churches.

In May 1956 the Original Secession Church in Scotland reunited with the Church of Scotland (Presbyterian) after a break which had lasted for 223 years. The Original Secession Church was a small body consisting of 14 congregations.

Asia.—A plan for union between the Methodists and the Congregationalists in Australia, modelled largely on the constitution of the United Church of Canada, had been under way for several years. During 1956 the Presbyterian Church of Australia approved participation in the negotiations in the hope that a three-way union might be effected.

In India representatives of the Church of South India and of the Lutheran churches of the country decided to suspend their joint theological discussions for a year as a result of their inability to reach agreement on the question of the historic episcopate. At the same time the Joint Theological commission suggested the holding of four regional conferences in 1957 between the two groups.

In the fall of 1956 a delegation from the Protestant Episcopal Church in the U.S.A. spent six weeks studying the Church of South India for the purpose of preparing a report as to whether the Episcopal Church should establish intercommunion with the Church of South India. The Church of South India was formed in 1947 by a union of Anglican, Methodist, Presbyterian, Congregational and Reformed bodies.

The plans for the United Church in North India and Pakistan were not pressed pending further study of certain details of the project, which was designed to unite Anglican, Baptist, Methodist, Presbyterian and Congregational bodies. Certain revisions were proposed as a means of meeting objections to the plan.

In Indonesia the synod of the Church of Central Java voted to continue negotiations aimed at establishing an all-Javanese Christian synod. The proposed body would link the Church of East Java (Reformed) and the Church in North Central Java (Mennonite) with the Central Java Church. The aim of the new "ecumenical synod" would be to facilitate co-operation and united action between these churches.

(See also LUTHERANS; PRESBYTERIAN CHURCH; RELIGION; UNITARIAN CHURCH.) (S. McC. C.)

Chromium and Chromite: see MINERAL AND METAL PRODUCTION AND PRICES.

Chronology: see CALENDAR OF EVENTS, 1956, pages 65-80.

Churches of Christ. The keynote among Churches of Christ in 1956 was well expressed in a new book about them entitled *The Church Is Building*. More than 1,000 church buildings were begun or enlarged in 1956. Since Churches of Christ are undenominational in nature and strictly congregational in government, exact figures on growth were not available. It was estimated that 500 new churches were started in 1956, making a total of 15,500 with approximately 1,650,000 members in the United States. Contributions continued to increase and were estimated at more than \$47,000,000 for evangelistic, benevolent and missionary causes. Sunday Bible school attendance continued to grow with thousands of churches having teacher training courses, many of them for the first time. Bible encampments multiplied.

Increased emphasis on missions was demonstrated by the Annual European Lectureship in Frankfurt, Ger., which was attended by workers from 13 nations. It was reported there that more than 100 new churches had been established in Europe since 1946. About 130 workers were being supported in 50 nations by churches in America.

Four new Christian colleges were launched during 1956: Lubbock Christian college, Lubbock, Tex.; York college, York, Neb.; Northeastern Christian college, Philadelphia, Pa., and Columbia Christian college, Portland, Ore. Central Christian college of Bartlesville, Okla., secured a new campus in Oklahoma City and announced plans to move in 1957. Ibaraki Christian college in Ibaraki, Japan, a fully accredited junior college eight years old, announced that its enrollment reached 600. Southwestern Christian college in Terrell, Tex., started a drive to enlarge its facilities. Plans for a new Christian college in Detroit, Mich., were announced.

A new home for orphans was opened in Valparaiso, Ind., and a new home for the aged in Romeo, Mich. A new magazine for preachers and elders, the *Minister's Monthly*, was begun in Nashville, Tenn., as well as a new daily devotional guide, *Power for Today*.

(M. N. Y.)

Church Membership. The latest information in 1956 concerning church membership in 258 religious bodies in continental United States, appearing in the

Yearbook of American Churches for 1957 (New York, 1956), indicated that there were 100,162,529 persons in 305,449 local churches or congregations. The figures were mainly for church years ending in 1955. This compared with 97,482,611 members reported in the *Yearbook* a year earlier. There were 82 religious bodies reporting more than 50,000 members each (see Table I), and their total membership was 98,571,528, or more than 98% of all members of religious bodies. The remaining 2% were found in 176 smaller bodies of the nation.

Church membership, officially reported, had been increasing for many years, as had also the proportion of church membership in the total population. In 1955 church members were 60.9% of the population. Since 1926, the date of the last adequate census of religious bodies made by the bureau of the census, church membership had increased more than 84%, while the estimated population increased over 40%.

However, nothing was known about church attendance or other participation, or the proportion of church members contributing money.

The Church of Christ, Scientist, does not report membership because of a regulation of that body which forbids the numbering of the people and the reporting of such statistics for publication.

In 1955 about 58% of church members in the U.S. were classified as Protestant, 33% Roman Catholic, 6% in Jewish congregations and 3% in all other bodies including Eastern Orthodox and Old Catholic.

(B. Y. L.)

Table I.—Church Membership in Continental United States, as Reported in 1956, for Religious Bodies With More Than 50,000 Members

Body	Members, 1956	Members, 1955
Adventists, Seventh-day	277,162	270,079
Apostolic Overcoming Holy Church of God	75,000	75,000
Assemblies of God	400,047	400,000
Baptist Bodies:		
American Baptist Convention	1,513,697	1,505,871
Southern Baptist Convention	8,467,439	8,163,562
National Baptist Convention, U.S.A., Inc.	4,557,416	4,557,416
National Baptist Convention of America	2,610,774	2,608,974
American Baptist Association	286,691	286,691
Baptist General Conference of America	54,000	52,483
Conservative Baptist Association of America	250,000	"
Free Will Baptists	159,831	405,000
General Association of Regular Baptist Churches	124,039	113,878
General Baptists	53,893	51,368
National Baptist Evangelical Life and Soul Saving Assembly of U.S.A.	57,674	57,674
National Primitive Baptist Convention of the U.S.A.	80,000	80,000
North American Baptist Association	251,062	243,750
Primitive Baptists	72,000	72,000
United Baptists	63,641	60,525
United Free Will Baptist Church	100,000	100,000
Brethren (German Baptist):		
Church of the Brethren	195,609	193,547
Buddhist Churches of America	63,000	63,000
Christ Unity Science Church	1,581,286	1,581,286
Christian and Missionary Alliance	57,109	61,483
Churches of God:		
Church of God (Cleveland, Tenn.)	142,668	138,349
Church of God (Anderson, Ind.)	123,523	118,696
The Church of God	70,941	68,673
Church of God in Christ	343,928	328,304
Church of the Nazarene	270,576	260,551
Churches of Christ	1,600,000	1,600,000
Congregational Christian Churches	1,342,045	1,298,205
Disciples of Christ, International Convention	1,897,736	1,881,911
Eastern Orthodox Churches:		
American Carpatho-Russian Orthodox Greek Catholic Church	100,000	75,100
Armenian Apostolic Orthodox Church of America	75,000	80,000
Greek Archdiocese of North and South America	1,000,000	1,000,000
Rumanian Orthodox Episcopate of America	50,000	50,000
The Russian Orthodox Greek Catholic Church of America	750,000	440,000
The Russian Orthodox Church Outside Russia	55,000	55,000
Serbian Eastern Orthodox Church	100,000	100,000
Syrian Antiochian Orthodox Church	100,000	75,000
Ukrainian Orthodox Church of U.S.A.	71,940	71,248
Evangelical and Reformed Church	774,277	761,842
Evangelical Mission Covenant Church of America	53,388	53,388
Evangelical United Brethren Church	737,489	746,206
Federated Churches	88,411	88,411
Friends:		
The Five Years Meeting of Friends	70,245	69,560
Independent Fundamental Churches of America	65,000	65,000

Table I.—Church Membership in Continental United States, as Reported in 1956, for Religious Bodies With More Than 50,000 Members—Continued

Body	Members, 1956	Members, 1955
International Church of the Foursquare Gospel	94,571	87,206
Mohavah's Witnesses	187,120	*
Jewish Congregations	5,500,000	5,500,000
Latter Day Saints:		
Church of Jesus Christ of Latter Day Saints	1,230,021	1,179,887
Reorganized Church of Jesus Christ of Latter Day Saints	137,856	134,705
Lutheran:		
Lutheran Synodical Conference of N.A.:		
Lutheran Church, Missouri Synod	2,004,110	1,932,000
Evangelical Lutheran Joint Synod of Wisconsin and		
Other States	328,969	322,947
American Lutheran Church	836,485	779,790
Augustana Evangelical Lutheran Church	529,602	510,116
Evangelical Lutheran Church	940,580	900,536
Lutheran Free Church	72,135	68,773
United Evangelical Lutheran Church	54,098	52,236
United Lutheran Church in America	2,175,726	2,113,779
Mennonite Church	70,283	63,998
Methodist Bodies:		
African Methodist Episcopal Church	1,166,301	1,166,301
African Methodist Episcopal Zion Church	760,000	760,158
Christian Methodist Episcopal Church†	392,167	392,167
Free Methodist Church of N. A.	51,437	50,660
The Methodist Church	9,292,046	9,202,728
Moravian Church in America (Unitas Fratrum)	55,524	52,735
Old Catholic Churches:		
N.A. Old Roman Catholic Church	84,565	85,225
Pentecostal Assemblies:		
Pentecostal Assemblies of the World, Inc.	60,000	60,000
Pentecostal Church of God of America, Inc.	60,000	43,200
United Pentecostal Church	125,000	125,000
Polish National Catholic Church	265,879	265,879
Presbyterian Bodies:		
Cumberland Presbyterian Church	84,990	84,776
Presbyterian Church in the U.S.	810,917	780,837
Presbyterian Church in the U.S.A.	2,645,745	2,526,129
United Presbyterian Church of N.A.	244,973	237,233
Protestant Episcopal Church	2,757,944	2,660,699
Reformed Bodies:		
Christian Reformed Church	204,621	196,822
Reformed Church in America	205,323	203,230
Roman Catholic Church	33,396,647	32,403,332
Salvation Army	249,641	240,130
Spiritualists:		
International General Assembly of Spiritualists	163,000	157,000
Unitarian Churches	96,715	90,398
Totals	98,571,528	95,879,745

*Not reported in 1955. †1936. ‡Formerly Colored Methodist Episcopal Church.
Source: Yearbook of American Churches (1956 and 1957).

Principal Religions of the World.—Since some of the religions are in no sense exclusive in their claims, some people may belong to as many as two or three different faiths. This is especially true in China and Japan. Any figures given must therefore be only estimates. There were in 1956 no reliable statistics as to what had happened to the religions of China under communism, nor was there any sure way of knowing how many in the U.S.S.R. still clung to their traditional faith. Protestant and Roman Catholic membership figures are not really comparable, since Roman Catholics count all baptized persons as members, while most Protestant groups count only those who "join the church."
(C. S. B.)

Table II.—Estimated Memberships of the Principal Religions of the World, 1956

Religion	North America	South America	Europe	Asia	Africa	Oceania*	Total
all Christians . . .	160,760,507	117,397,913	456,357,814	47,175,262	30,879,417	10,828,482	820,399,455
Roman Catholic† . .	90,582,000‡	111,922,000	230,338,000§	30,144,000	18,608,000	2,483,000	484,077,000
Eastern Orthodox . .	2,386,000	...	112,447,669	8,106,071	5,868,089	...	128,807,829
Protestant	67,792,567	2,475,913	113,572,145	8,925,191	6,403,328	8,345,482	207,514,626
Jewish	5,430,000	632,362	3,442,627	1,684,454	660,750	58,250	11,908,443
Muslim	33,000	342,615	12,425,300	318,341,515	85,325,598	102,000	416,570,028
Hindu . . . . .	...	...	...	140,000	...	...	140,000
Buddhist . . . . .	...	...	...	30,000,000	...	...	30,000,000
Sikh	15,000	17,000	12,000	50,000,000	1,200	8,000	50,053,200
Confucian	86,000	95,000	50,000	300,000,000	7,500	52,000	300,290,500
Hinduist	165,000	135,000	10,000	150,000,000	...	...	150,310,000
Jain	10,000	275,000	...	318,467,610	300,000	100,000	319,152,610
Buddhist	50,000	1,000,000	...	45,000,000	75,000,000	100,000	121,150,000
Others or none . . .	67,422,433	872,110	86,807,259	229,790,159	17,739,535	3,308,268	405,939,764
Grand total	233,972,000	117,767,000	559,105,000	1,490,599,000	209,914,000	14,557,000	2,625,914,000

*Includes Australia, New Zealand and Oceania.

†Roman Catholic statistics furnished by Catholic Student's Mission Crusade, Cincinnati, O.

‡Includes Catholics in Central America and the West Indies.

§Includes Communist-controlled Eurasia.

*Includes total Jewish population whether or not related to the synagogue, as estimated in *The American Jewish Yearbook*, vol. 56.

†Moslem figures are from a Moslem statistical survey of world Islam, published by the *Islamic Review* (1955).

Cigars and Cigarettes: see TOBACCO.

C.I.O.: see LABOUR UNIONS.

Circuses: see SHOWS.

City and Town Planning: see BUILDING AND CONSTRUCTION INDUSTRY; MUNICIPAL GOVERNMENT; TOWN AND REGIONAL PLANNING; URBAN TRANSPORTATION, U.S.

Civil Aeronautics Administration. During 1956, attention was focused on expansion and improvement of the air traffic control system of the United States, as the volume of operations by airline, military and executive aircraft continued to increase.

Scheduled Operations.—Revenue passenger-miles flown by U.S. domestic scheduled air carriers increased 15%, from 18,345,000,000 in fiscal 1955 to 21,129,000,000 in fiscal 1956. United States international scheduled carriers increased their revenue passenger-miles flown in the same period by 16%, from 4,067,000,000 to 4,737,000,000. Ton-miles of express carried by the domestic operators increased 15%, freight 12% and mail 6%, while international express and freight ton-miles increased 15% and mail 18%.

Airways.—To cope with the growing traffic, Civil Aeronautics Administration (CAA) submitted to congress a five-year federal airway plan, calling for expenditure of \$246,000,000 on new facilities. A total of \$75,000,000 was voted for the purpose, including a supplemental appropriation aimed at concentrating the program into three years.

Long-range radar with associated direct communications between controller and pilot was an essential element of the program. A start on long-range radar operations was made by relocating the New York facility to permanent quarters; installation of facilities at Chicago, Ill., and Norfolk, Va.; and negotiations with the military for use of defense radars in traffic control.

The number of channels available for direct communication between CAA controllers and pilots reached 70, with 136 additional programmed in the fiscal year which began July 1, 1956.

Other facilities added during the year included 16 omnidirectional radio ranges, 3 airport surveillance radars and 2 approach light systems. Improvements providing greater accuracy were made at approximately 80 existing omnidirectional ranges, and production was under way on equipment for 47 additional locations. Procurement of 30 additional approach light systems also had been initiated.

Four long-range navigational aids for transoceanic flights were in the process of installation; those at Atlantic City, N.J., and Nantucket Island, Mass., were near completion, with two sites in California at an earlier stage.

An extensive program of ultra-high frequency air-ground communications for military aircraft was carried on, with 1,700 channels installed at 500 CAA facilities.

A Central Altitude Reservation facility was established at Kansas City, Mo., to approve all military altitude reservation requests.

Training.—A highly accelerated program of training air traffic controllers was begun with a class of 80 newly employed personnel, the first of approximately 6,000 expected to be hired in the next five

years. In all fields, a total of 1,490 students, including CAA, military and foreign trainees, completed courses at the CAA Aeronautical centre, Oklahoma City, Okla., during fiscal 1956, an increase of 25% over fiscal 1955.

Aircraft Safety.—CAA issued certificates of approval for 6 new transport aircraft, 5 new types of helicopters, and 12 models in the small aircraft field. Work was begun on applications for type certification of the first two U.S. jet transports, the Boeing 707 and the Douglas DC-8; on the Lockheed Electra turboprop; and on the Fairchild M-185 jet-powered executive transport. Applications also were on hand from foreign manufacturers for approval of 14 transport aircraft, 9 of them turbine-powered; 3 personal types and 2 helicopters.

During fiscal 1956, 45 engine approvals were granted, and type certificates were issued for 52 propeller models.

Civil aircraft production, conducted under CAA safety controls, increased heavily. Aircraft output was 6,072, an increase of 60% over fiscal 1955; 9,582 engines were produced, a gain of 43%; and 14,000 propellers, a rise of 28%. (See also AIRCRAFT MANUFACTURE.)

Airmen.—During fiscal 1956, 72,031 airman certificates were issued, plus 48,999 student pilot applications processed. The first airline transport pilot rating in jet aircraft was issued.

CAA took a leading part in establishment of a training course for aerial applicator pilots at Texas A. and M. college.

Airports.—Federal aid allocations to communities for airport improvement were the largest in history during fiscal 1956. A program involving 205 airports and \$19,364,078 in federal funds was announced Aug. 10, 1955, followed by allocations of \$38,932,065 for 319 airports on Feb. 9, 1956, and a fiscal 1957 program of \$51,863,177 for 368 communities announced on June 12, 1956.

Planning and Development.—A CAA Jet Age Planning group was established to work with industry and government. It started operations with a preliminary list of 100 jet age problems developed as a result of a symposium called together in Jan. 1956.

Activity at the CAA Technical Development centre, Indianapolis, Ind., included tests of using traffic information obtained by microwave relay from a remote air defense radar, and of bird impact on the windshield of a new jet transport. The centre also established a branch in the Boston, Mass., area to work with military research facilities on possible integration of air defense and civil air traffic control systems.

International.—Considerable progress was made toward world-wide adoption of a common system of air navigation and traffic control, particularly in widespread installation of omnidirectional radio ranges. At the close of fiscal 1956, 60 such units were operating in countries other than the U.S. and Canada, with 95 more in various stages of procurement. Approximately \$3,000,000 in U.S. funds was obligated during fiscal 1956 to assist 12 nations in the purchase and installation of aviation ground aids.

CAA missions provided technical assistance in 24 nations, while 167 foreign nationals went to the U.S. for training under CAA supervision, an increase of 50% over 1955. In addition, 554 officials of foreign governments and air enterprises visited U.S. aviation facilities under CAA auspices. (See also AVIATION, CIVIL.)

(B. M. St.)

Civil Defense, U.S. A five-year educational campaign by the Federal Civil Defense administration to awaken the United States public to the dangers facing the nation and the need for taking steps to survive these dangers made its greatest advance in 1956. Polls indicated that 62% of the people were willing to spend two to three hours a week on

civil defense training over a period of six months, and that 64% of the people were willing to be drafted for such training.

Increased recognition of civil defense as a deterrent to war and its role in the over-all national defense program gave impetus to demands for a shift in basic civil defense responsibility from states and localities to the federal government.

Holifield Committee.—The military operations subcommittee of the house committee on government operations, headed by Representative Chet Holifield of California, after six months of staff studies and extensive public hearings, recommended that legislation be drafted to vest the basic responsibility for civil defense in the federal government, with the states and local units of government having important supporting roles.

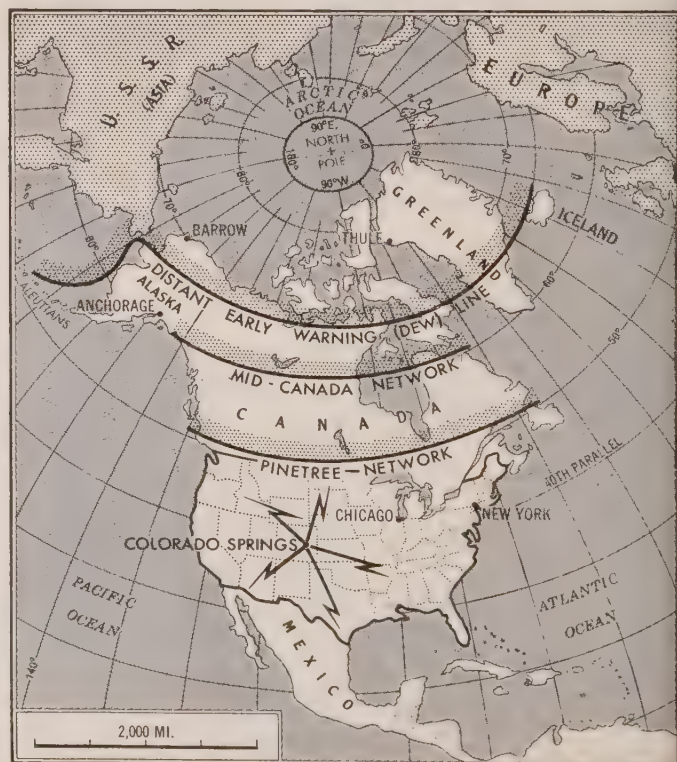
The committee also called for increased emphasis on a national shelter program and the establishment of a permanent department of civil defense, with cabinet rank.

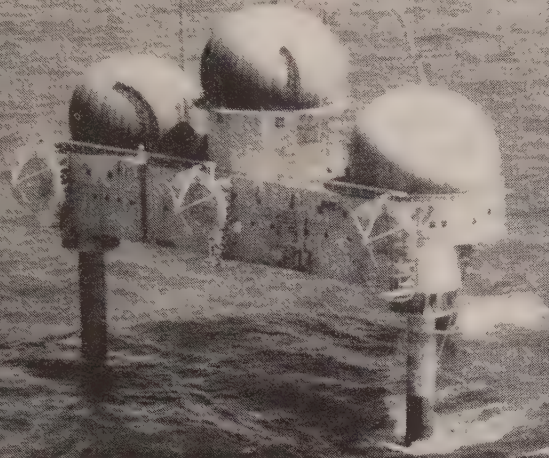
President's Letter.—On July 17, 1956, in a letter to Federal Civil Defense Administrator Val Peterson, Pres. Dwight D. Eisenhower said he would suggest new legislation in his Jan. 1957 message to congress. The president expressed a desire to avoid federal pre-emption of all civil defense programs which were dependent upon widespread citizen participation, but added that "the exigencies of the present threat require vesting in the Federal Government a larger responsibility in our national plan of civil defense."

Basic Concept.—The basic concept of civil defense remained unchanged, and there was nothing in the foreseeable future to indicate that this concept was likely to change. The concept, as it had been since the recognition of the radioactive fall-out danger, was a balanced program of evacuation and shelter. It was recognized that neither evacuation nor shelter, in itself, could be advanced as a complete solution, but that the proper combination of shelter, evacuation and welfare held the best hope for saving lives in event of thermonuclear attack on the nation.

Survival Studies.—The FCDA pushed ahead in efforts to determine the balance of shelter and evacuation which seemed likely

RADAR DEFENSE CHAINS of the continental air defense command (CONAD) in the U.S. and Canada, with headquarters in Colorado Springs, Colo. Additional installations are placed along the Atlantic and Pacific coastlines





TEXAS TOWER, a U.S. air force radar detection platform off Cape Cod, Mass., which in 1956 went into full-time, 24-hour operation scanning the Atlantic for aircraft. This was the first of several towers planned for construction

to save the greatest number of lives in individual localities. This was the purpose of Survival Plan studies which were authorized by congress in 1955 and which were given high priority in FCDA's program. The first phase of the studies was undertaken in areas which included more than half the population of the nation. In September, state and city civil defense organizations, working in partnership with FCDA, moved for greater speed and efficiency in this direction, by agreeing to an interim phase calling for immediate development of operational survival plans.

Radiological Defense.—In another national program, President Eisenhower instructed FCDA to develop a national radiological defense plan to meet the threat of radioactive fall-out from nuclear weapons. As the first step, FCDA issued its largest research contract (\$591,600) for research leading toward such a plan. Other activities in this field included the expansion of weather bureau fall-out pattern predictions and negotiations with the department of defense for developing a program of aerial monitoring of radioactivity.

Operation "Alert."—The most successful of FCDA's annual training exercises was held July 20–26, with 32 government agencies and bureaus moving from Washington, D.C., to secret location sites and carrying on their activities just as if the simulated nuclear attack on 70 cities had been real. Public participation was more widespread than ever before with hundreds of communities staging extensive Operation "Alert" activities.

A feature of Operation "Alert" was the first nation-wide blackout of commercial radio and television broadcasting for a 15-minute test of the conelrad emergency broadcasting plan.

Civil Defense Week.—The first National Civil Defense week (Sept. 9–15) honoured civil defense workers and stimulated interest in the civil defense program. More than 300 tons of civil defense promotional materials were distributed, and radio and television programs carried the civil defense message to virtually every home.

Mr. Civil Defense, a cartoon character created by Al Capp, was adopted as a civil defense trademark and was widely used in Civil Defense week promotional material.

Natural Disasters.—Local civil defense organizations dealt with a variety of natural disasters and were credited with saving lives and reducing property damage. Civil defense organiza-

tions were called into action during spring tornadoes in midwestern and southern states.

Appropriations.—Congress appropriated a record \$93,560,000 to FCDA for the 1957 fiscal year, an increase of nearly \$25,000,000 over the previous year. Part of the additional appropriation was budgeted for establishment of a civil defense graduate college, scheduled to open in April 1957 at the FCDA national headquarters in Battle Creek, Mich.

Val Peterson, former governor of Nebraska, was administrator of FCDA. Lewis Berry of Cheboygan, Mich., was appointed by President Eisenhower as deputy administrator.

(V. PN.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Atomic Alert* (1951).

Civil Rights.

Events of 1956, to a measurable extent, accentuated national schisms over the issue of civil rights in the United States. This was particularly true in the area of racial discrimination but it extended into other fields, such as the government's internal security program, the 5th amendment, passports to foreign travel, immigration and naturalization, sedition, the jury room and censorship.

Civil rights, individual rights and civil liberties are interchangeable terms in a broad field. In one form or another they were issues in the presidential election of 1956, although not as dominant or decisive a factor as many had anticipated at the start of the political campaigns.

Integration of the schools continued to be the major issue in the civil rights field, as it had been since the supreme court's 1954 ruling that separation of pupils on the basis of colour deprived Negroes of the equal protection of the laws guaranteed to all citizens by the constitution. Resistance to this constitutional decision and implementing mandates resulted in civil disorders in some areas.

No new rulings were handed down by the supreme court in this field. Lower federal courts, however, issued integration orders pursuant to earlier judgments of the high tribunal and in some school districts voluntary compliance was undertaken. When Negroes sought to attend all-white schools in Tennessee, Texas, Kentucky and elsewhere, either after court orders or ac-

tion by local school authorities, community resistance became so menacing that national guard troops and Texas rangers were called in to preserve or restore order.

Legislatures in several southern states continued to seek formulas for circumventing the supreme court's decision and preserving their segregated school systems. Anticipated court tests of new legislation in this field failed to develop in 1956.

The platforms of both political parties contained planks on civil rights. Each party avoided an extreme position.

The Republicans accepted the supreme court's position that desegregation was to be brought about "with all deliberate speed" by means of federal district court orders, supported by gradual modification of community attitudes. They opposed any attempt to compel school integration by force.

The Democratic platform pledged continuation of efforts to eradicate discrimination based on race, religion or national origin. As did the Republicans, they rejected all proposals for the use of force "to interfere with the orderly determination of these matters by the courts." This was a less positive plank than had been favoured by Adlai E. Stevenson, who became the presidential nominee, and many northern members of the party, and it was accepted by southern opponents of integration.

Once the platforms had been ratified and the candidates nominated, neither party blazoned the issue in the campaign. Leading candidates displayed a marked tendency to talk of other things and the issue was soft-pedalled except in a few speeches aimed at particular groups of voters.

The supreme court handed down four major decisions in the civil rights field during the year. These were in the Communist party, Nelson, Slochower and Cole cases.

The Communist party case involved an order of the Subversive Activities Control board requiring the party to register with the attorney general as a Communist-action organization as defined by the Internal Security act of 1950. The court sent this case back to the board for further consideration of the effect upon the board's decision of testimony given by three witnesses whose credibility was questioned. The board complied by expunging the tainted testimony from the record and eventually the case would again reach the supreme court for final judgment.

The Nelson case involved the question of whether the Smith act pre-empted prosecution in the field of subversion and sedition for the federal government. The Pennsylvania supreme court had set aside the conviction of Steve Nelson, a Communist leader, under a state law on the ground that it had been invalidated by the federal enactment. The supreme court sustained the ruling of the Pennsylvania tribunal. The decision affected the laws of the majority of states. This led to widespread protests from state law enforcement officials, whose views were generally supported by the department of justice. Bills were introduced in congress to restore concurrent jurisdiction to the states but they did not reach the floor in either house.

In the Slochower case the supreme court held that invocation of the 5th amendment by a Brooklyn college professor who refused to answer questions asked at a congressional inquiry about his Communist activities or affiliations was not grounds for his arbitrary dismissal without a hearing. The ruling invalidated a provision of New York city's charter that made automatic the discharge of any municipal employee who refused on the grounds of possible self-incrimination to answer questions asked at any official inquiry pertaining to his official conduct.

The whole concept of "security" and "loyalty" as merged in Pres. Dwight D. Eisenhower's executive order establishing the administration's internal security program was jolted by the supreme court's ruling in the Cole case. Kendrick M. Cole was dismissed from a nonsensitive job in the Food and Drug administration as a security risk. The court ruled that public law 733

under which the executive order was issued authorized dismissals only in the interest of national security. It held that the term "national security" as used in the law applied only to persons in sensitive jobs. The effect of the ruling was to remove several million government employees from under the administration's employee-security program. Bills to overrule the effect of the decision were introduced in congress but did not emerge from committees.

Early in the second session of the 84th congress, which began in January, the administration submitted a civil rights program. It proposed, among other things, the creation of a commission to investigate allegations of a denial of civil rights; the establishment of a civil rights division, headed by an assistant attorney general, in the department of justice; to allow the justice department to seek federal injunctions in behalf of persons deprived of civil rights; to permit individual citizens to bypass state courts and go directly to the federal judiciary with complaints of a denial of civil rights; and to allow the justice department to bring civil suits against civil rights conspiracies.

An omnibus bill embodying major proposals of the administration was passed by the house of representatives on July 23 by a vote of 279 to 126. Faced with threats of a filibuster by southern senators that would block other legislation and delay adjournment, senate leaders did not bring up the bill and congress adjourned without senate action.

The only civil rights legislation actually enacted was a bill making it a crime by any means or device to record, listen to or observe proceedings of grand or petit juries while they were deliberating or voting. This followed disclosures that a microphone had been concealed in a jury room in Wichita, Kan., with the consent of the judge, by social scientists of The University of Chicago who were studying the workings of the jury system.

The eternal fight between those who would forbid the distribution or display of books or pictures or films considered obscene or harmful to public morals, especially to youth, and those who regard such restrictions as impairments of the rights of free speech and the press continued on both national and local levels.

Because the statutory definition of what constituted obscenity, vulgarity or immorality was vague, the supreme court invalidated the law under which Kansas had forbidden exhibition of the motion picture *The Moon Is Blue*.

In April the Rhode Island legislature passed a bill to ban the possession, sale or loan to anyone under 18 of motion pictures, still pictures, books, pamphlets or magazines deemed to contain pornographic material. Legislatures of New York, Michigan, Massachusetts, Kentucky and Virginia considered bills to broaden statutory definitions of obscenity, to prohibit the sale of certain kinds of books to minors or to increase penalties for violating obscenity statutes.

The Maryland court of appeals reversed a ruling of the state board of censorship which banned a film called *The Man With the Golden Arm* on the grounds that it would teach the use of narcotics. The court said it was more likely to deter their use.

In the academic field, Princeton university (N.J.) authorities refused to prohibit a speech by Alger Hiss, former state department official who served a prison term for perjury; over the opposition of the governor of the state, the University of New Hampshire (Durham) authorities authorized a lecture on the coming victory of socialism over capitalism by Paul M. Sweezy; and the University of Wisconsin (Madison) rejected efforts of the American Legion to censor materials in the university library and bar use of university facilities "to certain groups and speakers. (See also EDUCATION; LAW; NEGROES, AMERICAN.)

(L. A. H.)

Civil Service, U.S. At the end of June 1956 there were 2,396,356 civilian employees on the federal payroll, practically no change from June 30, 1955.

Legislation.—The major changes in the conditions of employment in the federal service made in 1956 were embodied in public law 854. This bill provided for increases in salary for heads of executive departments and some other top federal officials; changes in the terms of office for the U.S. civil service commissioners; increases in retirement benefits for civil service employees; and the establishment of additional scientific and professional positions. High lights of these changes are as follows:

Salary Increases.—The bill provided a salary of \$25,000 to all cabinet members; \$22,500 for the director of the bureau of the budget, the comptroller general, director of office of defense mobilization, undersecretary of state, the deputy secretary of defense; and \$22,000 to the secretaries of the army, navy and air force. Officials such as the commissioner of internal revenue were to receive \$21,000; chairmen of boards such as the Civil Aeronautics board \$20,500; while officials such as the administrator of civil aeronautics would receive \$20,000. The bill also increased the compensation of employees in the top four grades of the civil service (GS 17-20).

These increases were made to bring salaries of top government officials more in line with the responsibilities of their positions, but salaries were still far less than those paid for comparable jobs in private industry.

Appointment of Civil Service Commissioners.—In the past, whenever there was a change in administration, all members of the civil service commission resigned and the new president appointed three new members—two from his own party and one from the minority party. In the future, the term of office for each commissioner would be six years. The first appointments under the new law would be for two-, four- and six-year terms. Thereafter, as terms expired every two years, appointments would be made for six-year terms.

This change was proposed by the house post office and civil service committee as a means of giving continuity to the civil service commission.

Civil Service Retirement.—The feature of public law 854 that affected the greatest number of federal employees was the section that amended the Civil Service Retirement act. The bill called for an increase in the amount deducted from the employee's salary (6½%), but it also provided a more liberal formula for computing benefits, a lower reduction rate for retirement before 60, and higher annuities for children. Also, for the first time survivor annuities were available to dependent widowers.

More Scientific Positions.—The final portion of public law 854 authorized the establishment of additional scientific and professional positions—120 in the department of defense and 15 in the National Security agency—to strengthen research functions.

Loyalty-Security Program.—A six-to-three ruling of the U.S. supreme court, made on June 11, 1956, provided that only federal employees who held "sensitive" positions could be dismissed as security risks, and therefore the president had violated the law in setting up a security program which covered all government workers. The 1950 statute on which executive order 10450 was based was intended to cover only positions concerned with the national safety.

After the court decision, the justice department pledged full cooperation; it advised agencies to restore to duty any employees in nonsensitive positions who were on suspension because of security charges and directed them not to use security procedures on any such workers in the future.

Overseas Employees Brought Under Civil Service.—Since the close of World War II, the number of federal civilian employees stationed throughout the world had greatly increased. In June 1956 there were 204,027 such employees. In the past, career employees of the foreign service had been the only major group of overseas civilian employees who were covered by a merit system. Among other drawbacks to the policy of exempting overseas employees from civil service coverage was the fact that career civil servants in the continental United States could not be transferred to overseas assignments and retain their civil service rights and benefits. In 1956 the U.S. civil service commission worked out a method to bring overseas employees under the civil service system. Citizens working for the defense department overseas would be eligible for career status if they could meet the competitive standards for their job, if they had at least six months' satisfactory performance, and if they were recommended for status by their agency.

Senior Civil Service.—The civil service of the United States is organized generally on a specialist basis. This method of job classification has resulted in a high level of technical competence, but it has tended to impede the development of managerial talent capable of moving from one type of governmental program to another. In 1955 the second Hoover commission, seeking ways to improve the development of administrative skills in the government service, recommended the establishment of a so-called senior civil service which would be composed of a relatively small group of general administrators with wide and varied experience. This group would have personal rank similar to that of officers in the armed services, and their pay would be independent of the particular duties to which they were assigned at any given time.

Although some of the recommendations would require legislative action by congress, the U.S. civil service commission in 1956 took the initiative to establish certain features of the proposal on a tryout basis. A senior civil service development committee would be established initially to advise the president and the civil service commission. Standards would be set up for making appointments to the group of career executives who would serve in key positions immediately below the policy-making level.

Those selected would be given a presidential commission, be expected to maintain political neutrality and live up to a rigid code of ethics.

(See also GOVERNMENT DEPARTMENTS AND BUREAUS, U.S.)
(E. R. BN.)

Civitan International: see SOCIETIES AND ASSOCIATIONS, U.S.

Clement, Frank Goad (1920—), U.S. governor and keynote speaker at the Democratic national convention in 1956, was born at Dickson, Tenn., on June 2. He took his law degree at Vanderbilt university, Nashville, Tenn., in 1942. From 1941 to 1943 he was with the federal bureau of investigation, then served in the army; from 1946 to 1950 he practised law at Nashville and Dickson, acting concurrently as chief counsel of the Tennessee state utilities commission. He was elected governor of Tennessee on the Democratic ticket in 1952 and re-elected in 1954—the second youngest governor in the state's history. Clement's administration was marked by reorganization of several of the state's departments, increased teacher salaries, partial desegregation of schools and a constitutional convention that abolished the state's poll tax.

By the beginning of his second term Clement was an important figure in the national Democratic political scene. Declining to run as Tennessee's "favourite son" candidate at the 1956 Demo-



GOV. FRANK CLEMENT delivering the keynote address at the Democratic national convention at Chicago, Ill., Aug. 13, 1956

cratic convention in Chicago, Ill., in deference to Sen. Estes Kefauver, Clement was selected as keynote speaker and was boomed for a time as vice-presidential nominee. In his keynote address on Aug. 13 at Chicago—a speech of almost evangelical tone and content—Clement attacked the Eisenhower administration in a “ten-count indictment against the defendant Republican party and its leadership.”

Cleveland. Cleveland, O., had a population of 914,808 by the federal census of 1950, making it the seventh most populous U.S. city. Cuyahoga county, which includes the city and most of its suburbs, had a 1950 population of 1,389,532. In 1956 the estimated population of the city was 944,000 and the county 1,540,000. Area of the city is 73.43 sq.mi. and the county 463 sq.mi.

Cleveland voters rejected at the November election a charter amendment calling for a 1.5 mill tax levy increase. Mayor Anthony J. Celebrezze declared the city would be in serious financial difficulties without the revenue from this levy increase and the council voted to re-submit the levy at a special election in Jan. 1957. The voters also defeated bond issues for bridges, a municipal court building, incinerators and freeways, but approved issues for streets, sewers and construction of a centre for the Pan-American games. Cleveland school district voters approved tax levies for operating expenses and construction of buildings. Democrats won all of the Cuyahoga county offices in the November election. They were: Joseph M. Sweeney, sheriff; Frank S. Day, recorder; Frank M. Brennan, treasurer; Albert S. Porter, engineer; Samuel R. Gerber, coroner; John F. Curry and Henry W. Speeth, commissioners; John T. Corrigan, prosecuting attorney; and Leonard F. Fuerst, clerk of common pleas court.

Labour troubles resulted in the suspension of publication of Cleveland's three daily newspapers on Nov. 1 and the city was without its local newspapers for 27 days.

On Feb. 1 the city began operating, and on April 28 it formally dedicated, its new \$3,500,000 passenger terminal at Cleveland Hopkins airport. The terminal was part of a \$22,000,000 airport improvement program. In May contracts totalling more than \$1,100,000 were let for construction of the north concourse. A record was set by Cleveland Hopkins airport in June 1956 when 168,000 passengers were logged in and out. During the first seven months of 1956 air freight shipped out of Cleveland totalled

17,608,031 lb., an increase of 728,303 lb. over the same period of 1955.

The city council gave its final approval on March 19 to putting fluorides in the city's drinking water, and the fluoridation of the water began July 2.

Winds of 70 m.p.h. struck the greater Cleveland area in a storm May 12, injuring 70 persons in the city and causing many millions of dollars of damage to property. Pres. Dwight D. Eisenhower on May 18 declared northern Ohio a major disaster area.

After years of planning by the city's urban renewal agency work began June 1, 1956, on the Garden Valley renewal project which would be a 247-ac. community with 1,200 housing units, schools, churches, parks, playgrounds and a shopping centre. For this project the federal government had extended a grant of \$3,941,024 and loans of \$4,676,875.

An increase in natural gas rates for homes of 5½ cents per 1,000 cu.ft. was approved by city council June 18 after extended negotiations with the East Ohio Gas Co. (R. H. Rs.)

ENCYCLOPÆDIA BRITANNICA FILMS.—Ohio (1955).

Climate: see METEOROLOGY.

Clothing Industry. The apparel industry in the United States showed considerable improvement in 1955 as compared with 1954, and further improved its position in 1956. For 1955, employment was at a relatively high level, and this condition continued for the first three quarters of 1956. Approximately 800,000 workers (80% women) were employed in the industry, in factories located mostly east of the Mississippi river.

Table I.—U.S. Apparel Industry Sales, 1955, at Wholesale Prices

Type of clothing	Number of Firms	Total sales
Men's and boys' tailored clothing	1,073	\$1,500,503,000
Men's furnishings and work clothes	1,021	1,753,378,000
Sports outerwear and rain outerwear	411	403,210,000
Women's wear		
Dresses	3,375	2,880,731,000
Coats and suits	1,308	1,131,844,000
Intimate apparel	1,100	1,095,671,000
Total	8,288	8,765,337,000

Men's and Boys' Apparel.—Whereas the men's and boys' clothing industry operated at 71% of capacity in 1954, factory operations rose to 78% in 1955 and for the first three quarters of 1956 were at 81% of capacity.

In 1955, regular weight men's suits were produced in larger amounts than in 1954, but summer-weight suits made no progress because of the huge carry-over from the previous year.

Table II.—Men's Apparel Production, United States

	(In 000)	1956 8 mo.	1955 8 mo.	1955 total	1954 total
Men's suits (all fabrics and weights)	14,384	13,994	21,328	19,301	
Regular weight suits	10,517	10,543	16,286	14,277	
Total summer weight suits (all fabrics)	3,867	3,451	5,042	5,024	
Summer weight (50% or more wool)	1,410	1,199	1,788	1,908	
Summer weight (less than 50% wool)	2,457	2,252	3,254	3,116	
Topcoats and overcoats	3,415	3,172	4,966	4,245	
Pants (all fabrics)	41,638	41,940	61,620	55,176	
Pants (less than 50% wool)	24,048	25,248	37,020	35,496	
Pants (50% or more wool)	17,590	16,692	24,600	19,680	

Of particular interest during 1956 was the growing popularity of man-made fibres in summer-weight suits, and special finishes had been added as features to such garments. The dacron and wool summer suits, which reduced wrinkling, were predominant in the lighter weight garments during the first half of 1956 and the so-called “wash and wear” fabrics became increasingly popular.

In general, there was a growing trend in the men's clothing industry toward lighter weight fabrics in wool for all year use, and in blends of wool and man-made fabrics for summer wear. The charcoal grays, popular in 1955, declined in popularity in

Table III.—Women's Apparel Production, United States
(In 000)

	1954	1955
Suits	11,065	12,073
Blouses	8,077	6,918
Rayon	3,660	2,840
Other	4,417	4,078
Dresses	83,807	82,127
Rayon	40,529	37,667
Other	43,278	44,460
Lower priced dresses	5,659	5,108
Cotton	5,151	4,586
Other	508	522
Suits	7,857	6,348
Cotton	5,500	4,371
Other	2,357	1,977
Rayon	3,410	3,466
Other	907	664
Blouses and half slips	2,503	2,802
Coats	7,309	7,018
Coat makers	1,882	2,179

1956. The "Ivy" type suits with the natural shoulder, made in the three-button model, grew increasingly in demand both in men's clothing and in boys' and students' clothing.

Men's sportswear became increasingly conservative in styling. The sport coat that previously had had an informal look now assembled, to a great extent, the regular tailored suit jacket. The three-button models were growing in popularity at the expense of the two-button sports coats.

During the first eight months of 1956 production of dress shirts was about the same as in the comparable period of 1955.

On the other hand, sport shirts showed a substantial increase, primarily those made of cotton. As in 1955, there was a sharp reduction in the production of sport shirts made of fabrics other than cotton.

Women's Apparel.—In the women's apparel industry, the production of suits declined during the first half of 1956, although women's coats showed an increase. Production of lower priced dresses dropped sharply, as did that of blouses.

CHILDREN'S PARTY CLOTHES of 1956. The boy is wearing a black velveteen suit and the girl a dotted white dress with black trimming and belt



Labour Developments.—In the men's tailored clothing field, manufacturers gave a 12½ cents an hour increase to all their unionized workers, and additional social benefits. In the shirt and work clothes field, union workers received ten cents an hour increase and additional social benefits. Labour-management relations in the apparel field as a whole continued on a friendly basis.

(H. A. CN.)

Coal. Of the 18 major coal-producing countries that supplied the record-breaking total of 2,356,000,000 short tons of coal in 1955, as shown in Table I, four countries alone contributed 69%. India expected to increase its output to 60,000,000 tons within a few years, to implement the expanding steel output in that country.

Table I.—Coal Production of the World
(In millions of short tons—all grades)

	1949	1950	1951	1952	1953	1954	1955
Canada	19.12	19.14	18.59	17.58	15.90	14.91	14.82
United States	480.57	560.38	576.33	507.42	488.24	421.08	496.38
Belgium	30.70	30.12	32.69	33.49	33.14	32.24	33.05
Czechoslovakia	47.98	50.69	52.16	57.44	58.49	63.49	70.44
France	58.47	57.89	60.60	63.22	60.12	62.08	63.26
Saar	15.72	16.64	17.95	17.90	18.10	18.54	19.10
Germany	335.18	361.83	403.26	412.5	431.59	444.91	472.05
Hungary	13.04	14.70	16.81	20.64	23.45	24.65	24.76
Japan	44.15	43.81	49.29	49.49	52.93	48.68	48.23
Netherlands	13.13	13.71	14.01	14.07	13.83	13.50	13.39
Poland	86.75	91.32	96.88	99.88	105.38	108.54	110.77
Spain	13.41	13.71	14.39	15.28	15.64	15.82	15.63
United Kingdom	240.95	242.28	249.61	253.67	251.11	250.94	248.19
U.S.S.R.	260	287	310	332	356	383	430
Yugoslavia	13.35	14.13	13.27	13.34	12.40	15.06	16.76
China	18	40.79	47.68	57	63	74	103
India	35.50	36.18	38.56	40.66	40.30	41.31	42.80
South Africa	28.10	29.18	29.36	30.94	31.37	32.31	35.44
Australia	24.05	26.74	28.50	30.81	29.87	32.58	32.92
Total	1,825	1,999	2,116	2,123	2,160	2,159	2,356

United States.—The coal industry shared in the general upswing in industrial activity in 1955 and produced 19.9% more coal than in 1954. The number of coal mines increased from 6,000 in 1954 to 6,500 in 1955. More than 45,000,000 tons more coal was mechanically cleaned in 1955 than in the previous year. The fuel efficiency rate continued to improve. Based on data of the Federal Power commission, as of 1955, 0.95 lb. of coal was consumed to provide one kilowatt-hour of electric power compared with 0.99 lb. per kilowatt-hour in 1954. The gain in efficiency since 1919 had been 70.3%.

Table II.—Data of the Coal Industry in the United States
(In thousands of short tons)

	1950	1951	1952	1953	1954*	1955*
Production, total	560,388	576,335	507,420	488,239	421,083	496,380
Anthracite	44,077	42,670	40,583	30,949	29,083	26,400
Soft coals	516,311	533,665	466,841	457,290	392,000	470,000
Bituminous	512,941	530,373	463,824	454,439	389,197	467,000
Lignite	3,370	3,292	3,017	2,851	2,803	3,000
Anthracite						
Open-cut	11,834	11,135	10,697	8,606	7,940	?
Underground	32,243	31,534	29,886	22,343	21,144	?
Used locally	5,047	5,163	5,155	4,333	3,799	?
Shipped	39,030	37,507	35,428	26,617	24,677	?
Exports	3,892	5,956	4,592	2,724	2,851	3,152
Imports	18	27	29	31	6	?
Stocks	1,268	982	1,709	1,916	1,293	720
Consumption	39,900	37,000	35,300	28,000	26,900	?
Bituminous and lignite						
Open-cut	123,467	117,618	108,910	105,739	96,000	116,000
Underground	392,844	416,047	357,931	349,551	296,000	354,000
Used locally	13,217	15,162	12,953	12,408	?	?
Shipped	503,094	518,503	453,888	444,843	?	?
Exports	25,468	56,726	47,643	33,760	31,041	51,230
Imports	347	292	262	227	199	347
Stocks	72,516	76,636	76,745	80,614	69,201	68,423
Consumption	454,202	468,904	418,757	426,798	363,060	423,288
Railroads	60,969	54,005	37,962	27,735	17,370	15,473
Coke ovens	103,845	113,448	97,614	112,874	85,391	107,377
Power utilities	88,262	101,898	103,309	112,283	115,235	140,470
Steel mills	7,698	7,973	6,820	6,207	4,944	5,221
Cement mills	7,943	8,525	8,073	8,362	8,124	8,696
Other industrial	98,164	105,634	95,863	97,437	78,953	91,856
Retail dealers	86,604	76,531	68,393	61,295	52,616	53,762

*Preliminary. †170 tons.

Anthracite.—Production of anthracite coal in 1955 was 8% smaller than in 1954. Under a state-federal \$17,000,000 appropriation in 1955 for floodwater control in the Pennsylvania anthracite field, two projects were approved in 1956. Additional pumping equipment was provided to one mine in the northern anthracite area and one in the southern anthracite area of the

Table III.—United States Production of Coal, by States
(In millions of short tons)

	1949	1950	1951	1952	1953	1954*	1955*
Alabama	12.9	14.4	13.6	11.4	12.5	9.9	12.0
Colorado	4.6	4.3	4.1	3.6	3.6	2.9	3.4
Illinois	47.2	56.3	54.2	45.8	46.0	42.0	46.3
Indiana	16.6	20.0	19.5	16.4	15.8	13.0	16.0
Kentucky	62.6	78.5	75.0	66.1	65.0	60.0	72.3
Ohio	31.0	37.8	37.9	36.2	34.7	30.2	36.8
Pennsylvania	89.2	105.9	108.6	89.2	93.3	71.6	86.6
Tennessee	4.2	5.1	5.4	5.3	5.5	6.7	7.6
Utah	6.2	6.7	6.1	6.1	6.6	5.6	6.3
Virginia	14.6	17.7	21.4	21.6	19.1	17.8	23.5
West Virginia	122.6	149.1	163.3	141.7	134.1	116.0	142.0
Wyoming	6.0	6.4	6.4	6.1	5.2	2.7	2.9
Others†	20.3	17.3	18.4	17.3	15.9	13.6	14.4
Total bituminous	437.9	516.3	533.7	466.8	457.3*	392.0	470.0
Anthracite	42.7	44.1	42.7	40.6	30.9	29.1	26.4
Grand total	480.6	560.4	576.3	507.4	488.2	419.1	496.4

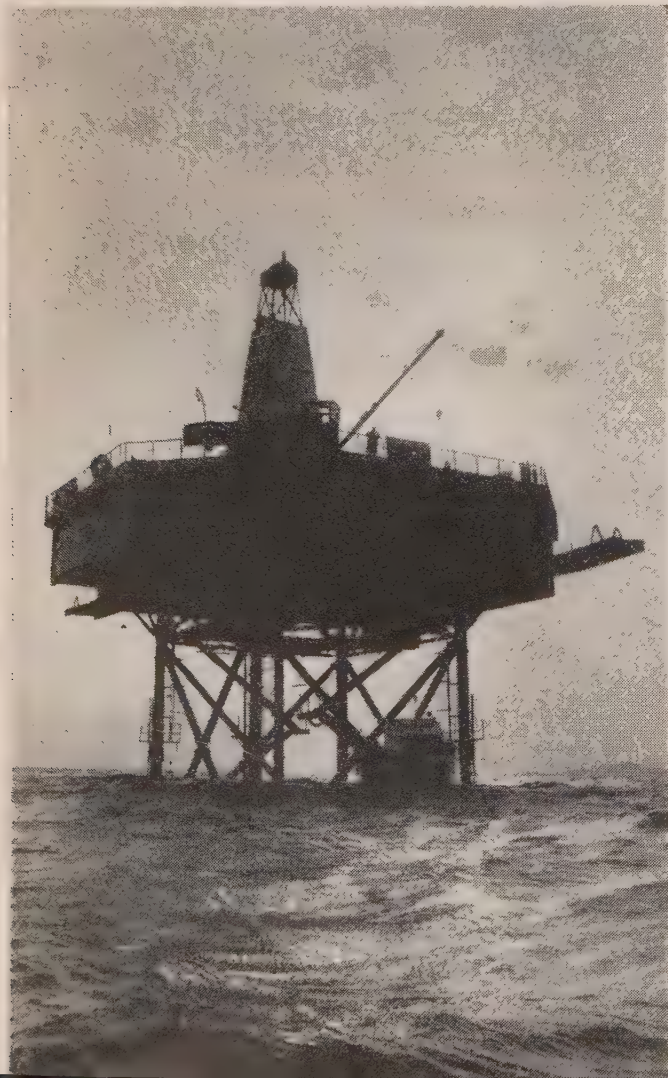
*Preliminary. †Others, in 1955, covers output of Alaska and 13 states, including North Dakota (2,980,000 tons lignite), Missouri (2,380,000 tons bituminous), Oklahoma (2,055,000 tons), Kansas (1,600,000 tons), Iowa (1,435,000 tons) and Montana (1,192,000 tons bituminous and 18,000 tons lignite).

state. The money was to be used solely for construction and not for operating and maintaining the completed project, and was to remain available until spent.

More than 40 tons of water were being pumped for every ton of anthracite produced. Aside from this program, research was intensified to extend the use of anthracite as a blast-furnace fuel. Anthracite does not coke, but it has long been used successfully for metallurgical purposes. It has some special advantages, but the high cost of production has made it unattractive commercially.

Bituminous.—Output of bituminous coal in the United States was maintained at a high rate during 1956 despite competitive inroads of other fuels, chiefly oil and gas. However, with in-

OFFSHORE COALING STATION in the Firth of Forth, Scotland. Exploratory bores beneath the water in 1956 indicated coal beds which were estimated to have a possible yield of 200,000,000 tons of coal. Mining would be accomplished by drilling underwater tunnels from the shore



creased demands in prospect for coal, scientific and economic research was extended.

In May 1956 a report by the U.S. bureau of mines gave results of the study made by the bureau in co-operation with industry. Important data were obtained on coal preparation and on improved methods of washing, burning, coking and gasifying bituminous coal. The bureau and the Atomic Energy commission began research to determine if nuclear energy can be used successfully in gasifying bituminous coal.

Looking to greater utilization of lignite, an abundant fuel in the United States, a broad program previewed power requirements for crushing and pulverizing. Recent new mines in Texas had increased lignite output by 1,000,000 tons per year.

In the first half of 1956 anthracite output was 8% above the 1955 rate and bituminous output was more than 18% higher. Data in this article on coal were obtained from the U.S. bureau of mines. (F. E. H.; B. B. M.)

Coast and Geodetic Survey, U.S. During 1956 this bureau of the department of commerce continued its program of services essential to marine and air navigation, to mapping and other engineering work, and to the development of the natural resources of the country. Its work embraces hydrographic and topographic surveys of the coastal regions of the United States and its possessions; the observation and analysis of tides and currents to furnish datum planes to engineers and tide and current predictions to mariners; the determination of geographical positions and elevations in the interior of the country to co-ordinate the coastal surveys and to provide a framework for mapping and other engineering work; observations of the earth's magnetism in all parts of the country to provide magnetic information essential to the mariner, aviator, land surveyor, radio engineer and others; seismological observations and investigations to furnish data for the design of earthquake-resistant structures; and the compilation and distribution of nautical and aeronautical charts to meet the needs of marine and air commerce.

Seventeen ships and two shore-based parties continued making basic hydrographic surveys along the coasts of the United States and Alaska during 1956. Along the Atlantic coast the program of wire dragging the sea lanes to locate wrecks caused by enemy submarine action during World War II was continued. Fifty-nine wrecks were located between the Virginia capes and Cape Fear, N.C. The electronically controlled hydrographic surveys of Browns bank and the northeastern part of the gulf of Maine were completed.

Topographic mapping by photogrammetric methods was continued along coastal areas of the United States and Alaska as part of the bureau's charting program. A special map of Providence, R.I., was prepared for use in storm-water inundation studies. This is a pilot project to determine the type of map information needed for evacuation when storm waters are forecast, for underwriting storm-damage insurance and for preventing storm damage. Under the airport mapping program, photographs were taken of 45 airports, field surveys completed at 39 airports and 13 new airport obstruction plans published, bringing the total number issued to date to 514.

As part of the tidal program of the bureau, a system of control tide stations was maintained at selected locations along the coasts of the United States and on some islands in the western Pacific. New stations were established at Panama City, Fla., and at Christmas Island in the Pacific ocean. A project to determine storm effects on water levels at tide stations was undertaken in connection with a hurricane warning project being developed by the United States weather bureau. A special current survey was made of Gloucester harbour, Mass., in connection

with a study being made by that city for the control of pollution and for beach preservation.

The geodetic networks of control in the United States were expanded to provide additional geographic positions and elevations for the national mapping program and for other engineering uses. Ground settlement studies were made in Arkansas and California. In the San Joaquin valley, Calif., the maximum rate of settlement reached $1\frac{3}{4}$ ft. per year. In Alaska, one of the principal accomplishments was the completion of several hundred miles of triangulation in the northern part. This completed the basic framework of triangulation in the territory. The adjustment of the northern Alaska triangulation was the largest ever accomplished by a single set of simultaneous equations. Astro-logic observations were made in the United States along the 5th parallel as a continuation of the study of the deviation of the geoid from the spheroid along a transcontinental profile.

In furtherance of the magnetic survey of the United States, observations were made at 39 stations in the United States and Alaska (13 were repeat stations) and at 6 observatories. A new magnetic observatory and laboratory near Fredericksburg, Va., to replace the old Cheltenham, Md., installation, was dedicated on May 23, 1956.

As part of its seismological work, the bureau operated 71 strong-motion seismographs in six states of the western seismic region. It also co-operated in maintaining stations in seven Central and South American countries. During the year, the bureau located 1,113 earthquakes throughout the world through its co-operative program with universities and institutions and several hundred independent stations. Seven of these were in the Pacific area and were located within an hour of occurrence for the seismic sea wave warning service. No major earthquake occurred in the United States during 1956.

More than 47,000,000 copies of nautical and aeronautical charts and related data were published—a greater volume than any previous year. A total of 806 nautical charts and 1,533 aeronautical charts were available in different series to meet the needs of marine and air navigation. A recompilation was begun of the Sectional series of aeronautical charts in order to incorporate new concepts of what the visual flight operator needs. A recompilation was also begun of all civil and military instrument approach and landing charts. (See also OCEANOGRAPHY; SEISMOLOGY.)

(H. A. Ko.)

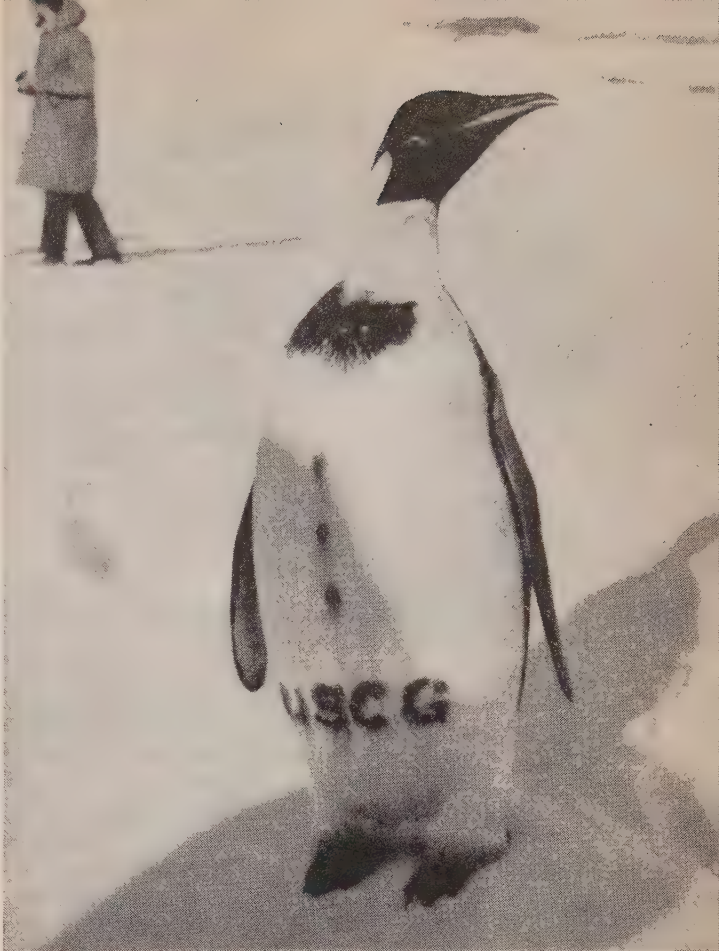
Coast Guard, U.S.

To the U.S. coast guard has been given the responsibility for the maintenance of safety and order on the high seas and navigable waters under the jurisdiction of the United States. The primary goal of coast guard duties is to prevent avoidable loss of life and property resulting from unsafe or illegal practices. To achieve this objective, the coast guard enforces federal maritime laws, operates aids to navigation, promotes efficiency in the operation of merchant vessels and motorboats, and rescues and aids distressed persons, vessels and aircraft.

The maintenance of safety and order in maritime activity is not limited to the strict enforcement of laws, but includes a program of education for shipowners, merchant vessel crews and boatmen, and the enlistment of their co-operation and self-regulation in the prevention of marine casualties.

Administered by the commandant from headquarters in Washington, D.C., the coast guard is a military organization and a branch of the armed forces. It operates under the treasury department except in time of war or when the president so directs, when it becomes a specialized service in the navy.

Activities of the coast guard in the fiscal year 1956 were aimed primarily at carrying out its historic peacetime mission: maintenance of safety and order on the high seas and navigable waters



ANTARCTIC MASCOT, a four-foot emperor penguin that became so interested in the cargo unloading process of the icebreaker "Eastwind" during Operation "Deepfreeze I" in June 1956 that he was given a U.S. coast guard mascot rating by the crewmen

of the United States. Expansion of the port security program resulted in the commissioning of seven cutters. One reactivated cutter was added to the ocean weather station program and a sailing vessel was accepted and commissioned by the coast guard for training purposes at the Coast Guard academy, New London, Conn. Funds available rose from \$208,705,170 to \$223,538,344. Military personnel strength increased from 28,321 in 1955 to 28,441 in 1956, while authorized civilian employees totalled 4,769 as compared with 5,082 in the previous year.

Throughout the year, the coast guard continued to carry out its regular duties of maritime law enforcement. These functions included promotion of safety and efficiency in the merchant marine; inspection of merchant vessels and enforcement of regulations for motorboats; operation of aids to navigation, including lighthouses, buoys and electronic signals; protection of life and property at sea; rescue and aid of persons, vessels and aircraft in distress; operation of ocean stations and the international ice patrol; and maintenance of a state of military preparedness for national emergencies.

The following statistics indicate the volume of law-enforcement activity, but not of preventive activity, taken by the coast guard during the year: vessels and motorboats boarded, 129,453; reports of violations of the Motorboat act, 11,245; reports of violations of port security regulations, 290; permits to load or discharge explosives, 1,054; total tonnage of explosives covered by permits, 362,079; explosives loadings supervised, 793; merchant mariners' documents issued bearing evidence of security clearance, 20,813; waterfront workers screened for security, 20,760, and total rejected as poor security risks, 50.

The coast guard also helped to enforce the Oil Pollution act, anchorage regulations, laws relating to internal revenue, customs, immigration, quarantine and the conservation and protection

of wildlife and fisheries.

Facilities used in assistance operations included a system of 141 lifeboat stations, together with communications centres, bases, vessels and aircraft at strategic points along the coast and inland waterways. Assistance rendered during the year is summarized in the following statistics: assistance calls responded to, 19,281; value of vessels and aircraft assisted (including cargoes), \$851,483,600; lives saved or persons rescued from peril, 3,769; vessels towed, 8,024; vessels refloated, 1,112; miles disabled vessels towed, 83,551.

During the year 3,045 marine casualties were reported, of which 2,459 were the subject of detailed investigations. Four hundred and six persons lost their lives in 201 of the casualties reported. Only one passenger lost his life as a result of a casualty to an inspected passenger vessel during the year.

The coast guard worked in close association with the American Boat and Yacht council in fiscal 1956. The objective of the council is to foster self-regulation and to promote recommended practices and engineering standards for improving the design, construction, equipage and maintenance of small craft.

The coast guard completed 5,886 inspections of merchant vessels with a gross tonnage of 17,897,958 tons; made dry-dock examinations of 4,538 vessels with a total tonnage of 15,187,509 tons; carried out 20,292 miscellaneous inspections; numbered 384,965 undocumented vessels; and reviewed plans for 17,305 merchant vessels.

As of June 30, 1956, there were 39,335 aids to navigation maintained in the United States, its territories and possessions, the Trust Territory of the Pacific Islands and at overseas military bases. These aids included 49 loran stations, 373 manned light stations and 33 lightships.

The coast guard maintained four ocean stations in the North Atlantic and two in the Pacific throughout the year. Ocean station vessels provided search and rescue, communications, air navigation facilities and meteorological services in the ocean areas regularly traversed by aircraft of the United States and other co-operating governments.

For the sixth consecutive year the international ice patrol was carried out by aerial reconnaissance so that continuous use of surface patrols was not required.

The coast guard's larger ships consisted of 178 cutters and buoy tenders of various types. The number of fixed and rotary-wing aircraft in operation ranged from 122 to 126. Coast guard reserve strength was 3,581 officers and 18,191 enlisted personnel.

The coast guard auxiliary, a nonmilitary organization of volunteers, was active in more than 400 communities in the promotion of safety and efficiency in the operation of small boats. Its 12,676 members examined 36,885 motorboats, patrolled 316 regattas and answered 2,289 calls for assistance.

Public health service personnel on duty with the coast guard included 45 dental officers, 37 medical officers, 8 nurses, 1 scientist officer and 1 sanitary engineer. (A. C. Rd.)

Cobalt: see MINERAL AND METAL PRODUCTION AND PRICES.

Cocoa (Cacao). World production of cocoa beans was preliminarily estimated for 1956-57 at slightly more than 800,000 long tons, as compared with a record 835,000 long tons in 1955-56, 796,000 long tons in 1954-55 and 753,000 long tons in 1953-54. As usual, practically all of the crop moved into the export market, largely to western Europe and the United States. World consumption was about 770,000 long tons, rising about 10% during 1955-56 but leaving substantial inventory stocks.

The steep price decline in cocoa beans which began from a

peak level of nearly 73 cents in 1954 was arrested in 1956; the price for Accra declined from about 32 cents per pound in January to about 23 cents in April, then fluctuated below 30 cents

World Cacao Production by Leading Areas
(In 000,000 lb.)

Area	1955-56	Average 1945-46 to 1949-50	Average 1935-36 to 1939-40
Gold Coast	511	512	601
Brazil	348	284	261
Nigeria	251	223	211
Ivory Coast	149	94	111
French Cameroun	141	91	51
Other	401	312	221
Total	1,801	1,516	1,581

Prices to producers were lowered about one-fourth. The fall in cocoa bean prices was reported as resulting in less thorough harvesting and less care being given to older trees, with newer plantings compensating only in part. Disease and pest control efforts continued as did accelerated planting programs, particularly in the Caribbean and southeast Asia areas. (J. K. R.)

Coffee. Early season estimates of the total world green coffee crop for 1956-57 showed an extraordinarily wide variance; the United States department of agriculture predicted a crop of 47,355,000 bags (of 132 lb. each), of which 36,535,000 bags were expected to be exported; officials of the Brazilian Coffee institute indicated a crop of only 32,000,000 bags, stating that rains had reduced Brazilian expectations to little more than 10,000,000 bags against the U.S. department of agriculture estimate of 15,500,000 bags. The United Nations' Food and Agriculture organization first indicated that world production would probably be lower than in 1955-56, but later announced that it would reach a new record level of about 44,000,000 bags, 7% more than in 1955-56.

Coffee Production (Green) in the Principal Producing Countries
(In 000 bags, 132.3 lb. each)

Country	1956-57*	1955-56	1954-55	Average 1946-47 to 1950-51	1935-36 to 1939-40
Brazil	19,000	23,500	18,100	18,704	25,341
Colombia	7,400	6,800	6,405	5,840	4,451
French West Africa	2,085	2,105	1,745	940	251
Mexico	1,700	1,440	1,600	1,004	951
El Salvador	1,415	1,250	1,335	1,203	1,091
Uganda	1,410	1,300	1,180	494	221
Indonesia	1,300	1,190	744	485	1,961
Angola	1,058	1,178	962	816	301
Venezuela	900	600	820	698	941
Belgian Congo	885	765	575	538	321
Ethiopia	820	900	762	343	341
Madagascar	720	910	636	503	531
Guatemala	633	735	528	1,044	1,001

*Forecast.

Source: U.S. Department of Agriculture, *Foreign Crops and Markets*, vol. 71, no. 2, p. 5.

Probable world consumption was variously estimated at from 34,000,000 to 37,000,000 bags.

World exports of green coffee during 1955 were 34,025,000 bags, about 16% higher than the 29,287,000 bags of the previous year. Of that total, 13,696,000 bags were from Brazil, as compared with 10,918,000 bags the previous year. Africa exported 7,131,000 bags, as compared with 5,754,000 bags the year before. The U.S. imported 19,565,000 bags, against 16,427,000 bags in 1954. U.S. imports during the first half of 1956 were 11,238,000 bags, the highest number since 1946 and 25% larger than for the first half of 1955.

U.S. inventories were increased by more than 1,000,000 bags. Inventories accumulated in Brazil and in Africa, particularly of lower grades. Although an over-all surplus of several million bags was indicated, mild types, largely from middle America, were believed sufficient to meet consumption but not to rebuild inventories of this type.

A price decline in coffee was widely anticipated as the U.S. inventory situation improved and a substantial surplus accumulated in Brazil from the large 1955-56 crop. Instead, there was

the paradox of a strong and rising market in the face of easier supplies. Some Brazilian coffee contracts on the New York market fluctuated between 56 and 61 cents per pound, or about 10 cents higher than during the previous year. U.S. retail prices for vacuum-packed coffee were increased to more than \$1.00 per pound, without meeting apparently much of the consumer resistance anticipated in some places. The Hamburg Coffee exchange, once second only to that of New York, was formally reopened in March, after a suspension of nearly 17 years.

The Economic and Social Council of the Organization of American States proposed, but did not secure during 1956, the adoption of an international agreement designed to stabilize coffee prices. The U.S. announced that it was unable to lead in negotiating such an agreement or to become a participant in it.

The "coffee break" became further entrenched as a fringe benefit and morale booster among U.S. workers. The retail battle between the instant or soluble form and the ground berry for brewing continued unabated, with soluble types accounting for about 15% of the coffee berries used, a 50% increase since 1954.

(J. K. R.)

Coinage. United States government mints manufactured 1,419,850,542 domestic and foreign coins during the U.S. government fiscal year ended June 30, 1956. Details are shown in the tables.

Table I.—U.S. Coins Manufactured, Fiscal Year 1956

Denomination	Number of pieces	Face value	Metallic composition
Half dollars	2,424,654	\$ 1,212,327.00	Silver
Quarter dollars	42,769,454	10,692,363.50	Silver
Dimes	120,429,954	12,042,995.40	Silver
Five-cent pieces	40,872,340	2,043,617.00	Cupronickel
One-cent pieces	1,207,249,140	12,072,491.40	Bronze
Total	1,413,745,542	\$38,063,794.30	

Table II.—Foreign Coins Manufactured by U.S. Mints, Fiscal Year 1956

Government	Number of pieces
Dominican Republic	35,000
Honduras	6,070,000
Total	6,105,000

The bureau of the mint in 1956 included the office of the director in Washington, D.C.; the mints located in Philadelphia, Pa., Denver, Colo., and San Francisco, Calif., the latter currently operating only as a refinery and assay office; the Fort Knox, Ky., gold bullion depository; the West Point, N.Y., silver bullion depository; and the New York assay office.

In addition to coinage production, the bureau directs shipment of domestic coins for circulation from the mints and among the Federal Reserve banks; has custody of the government's monetary metals, valued at many billions of dollars; acquires, assays and refines gold and silver bullion; administers the issuance of treasury licenses for the acquisition, ownership, possession, use and exportation of gold for industrial, professional and artistic purposes; and produces historic medals and medals and other decorations for U.S. government agencies. (L. Hd.)

Coke. The United States bureau of mines data (Tables I and II) show that 1955 was a banner year for the world coke-producing countries.

United States.—In 1955 U.S. coke production followed the uptrend in industrial activity which began in the latter part of 1954. In the last two decades the quantity of coke consumed in making iron and steel rose steadily and that for domestic heating declined. As of about 1935, about 65% of total coke was used in the iron industries, 15% for all other industrial plants and 20% for domestic heating. In 1955 the proportions were respectively 94%, 5% and 1%. Less than 1% of all coke and breeze produced was exported. Coke output in the first half of 1956 was 39,895,410 tons or 10% more than in the 1955 period.

(F. E. H.; B. B. M.)

Table I.—World Production of Coke*

	1950	1951	1952	1953	1954	1955
Australia	1,325	1,698	1,940	2,277	2,295	2,240
Belgium	5,054	6,731	7,076	6,562	6,776	7,275
Canada	3,477	3,401	3,593	3,809	3,082	3,714
Czechoslovakia	5,375	5,595	6,151	6,518	6,600	6,834 ²
France	7,755	8,906	10,494	9,514	10,153	11,822
Saar	3,557	4,151	4,285	3,956	4,041	4,342
Germany	30,459	37,464	41,521	42,139	39,062	45,233
Great Britain	17,295	18,027	19,143	19,579	19,996	20,276
Poland	6,587	6,984	8,111	8,678	9,373	11,023
India	2,481	2,406	2,289	2,252	2,643	2,908
Italy	1,670	2,404	2,723	2,689	2,889	3,251
Japan	2,989	4,259	4,402	5,258	4,840	5,198
Netherlands	3,091	3,277	3,558	3,532	3,699	4,300
U.S.S.R.	30,000 ²	33,000 ²	37,000 ²	42,000 ²	46,000 ²	48,000 ²
United States	72,718	79,331	68,254	78,837	59,662	75,302
Total	201,000	225,000	230,000	249,000	233,000	266,000

*Not including gashouse coke.

Table II.—Coke Production in U.S.

	1950	1951	1952	1953	1954	1955*
Production	72,718	79,331	68,254	78,244	59,662	75,302
By-product	66,891	71,987	63,850	73,010	59,061	73,584
Beehive	5,827	7,344	4,404	5,234	601	1,718
Breeze made	5,263	5,213	4,703	5,254	3,931	4,951
Coal charged	104,015	113,686	97,821	113,149	85,620	107,743
Consumption, total	73,417	78,093	67,356	77,881	58,982	76,048
By iron furnaces	61,039	67,441	58,183	69,729	51,961	68,156

*Revised.

Coldwell, Major James (1888—), Canadian political leader. was born at Seaton, Eng., Dec. 2. He attended University college, Exeter, emigrated to Canada in 1910, and for 20 years was an educationist in Regina, Sask., where he also served on the city council, 1922–32, and was provincial leader of the Saskatchewan Farmer-Labour party, 1932–35. In 1935 he was elected to the house of commons for Rosetown-Biggar, Sask., for the Co-operative Commonwealth federation, and has been re-elected since in each general election. In 1942 he was named president and party leader of the C.C.F. In 1945 he was a member of the Canadian delegation to the United Nations conference at San Francisco, and in 1953 he was named a parliamentary observer on the Canadian delegation to the UN. He was the author of *Left Turn, Canada*.

During the 1956 session of parliament, he called for recognition of the Peking government of China and its admission to the United Nations, with Formosa to be neutralized and placed under the United Nations. As a supporter of the admission of a rearmmed German Federal Republic to the North Atlantic Treaty organization, he still expressed doubts about the difficulties of building controls which German militarism could not circumvent, and the lessening value in a hydrogen-bomb era of 12 German divisions. He urged that Canada "should bring about a conference of the powers which have nuclear weapons with a view first to ending these dangerous experiments." With regard to the "cold war," he called for greater efforts to remove the causes of disease, famine and poverty and to raise the standards of living throughout the world.

For the first time, he presented a draft of an amendment to the Canadian constitution, the British North America act, providing for a Canadian bill of rights to guarantee the rights of all Canadians in legal language. He urged an unearned capital-gains tax so that this capital might be diverted into social investment, and an increase in the personal income-tax exemptions accompanied by an increase in corporation income tax.

(M. L. S.)

Colleges and Universities: see UNIVERSITIES AND COLLEGES.

Colombia. A republic situated in northwestern South America adjoining the Isthmus of Panamá, Colombia is the only South American country with both Caribbean and Pacific coast lines. Area 439,519 sq.mi.; pop. (1951 census) 11,548,172; (1956 est.) 12,939,000. Approximately 68%



DISASTER AT CALI, COLOMBIA. A view of the section of the city in which a dynamite explosion razed eight blocks, killing more than 1,200 persons, Aug. 7, 1956

of the population is classified as mixed blood, 20% as white, 7% as Indian and 5% as Negro. Most Colombians live in the highlands and mountain valleys of the interior. The capital is Bogotá (1951 census) 638,562, (1954 est.) 765,360. Other major cities (with 1951 census, 1954 est. in parentheses) are Barranquilla, 276,199 (324,700); Bucaramanga 102,887 (136,170); Cali 241,357 (365,800); Cartagena, 111,291 (142,800); Cúcuta, 70,375 (107,820); Ibagué, 54,347 (110,900); Manizales, 88,893 (138,680); Medellín, 328,294 (431,380); Neiva, 33,040 (55,540); Pasto, 48,853 (91,520); Popayán, 31,866 (49,440); Santa Marta, 37,005 (51,660); and Tunja, 23,008. Language: Spanish. Religion: predominantly Roman Catholic. President in 1956: Lieut. Gen. Gustavo Rojas Pinilla.

History.—The government of Pres. Gustavo Rojas Pinilla grew increasingly authoritarian during 1956. These authoritarian aspects of the regime were clearly demonstrated in its treatment of the Colombian press. Confiscatory back taxes, fines and newsprint storage charges were levied against the Liberal newspapers *El Independiente* and *Intermedio* (formerly *El Espectador* and *El Tiempo*) of Bogotá and the Conservative *El Colombiano* of Medellín in the amounts of 350,000, 2,500,000, and 600,000 pesos, respectively. *El Independiente* later suspended operation rather than print the government version of a raid by secret police on the national Liberal party headquarters. In addition to violating freedom of the press, Rojas Pinilla also inaugurated a government newspaper, *Diario Oficial*, which was said to have the most modern printing plant in Latin America.

In an effort to counter the growing dissatisfaction with his regime, Rojas Pinilla on June 13, the third anniversary of his assuming power, inaugurated a Third Force movement of workers, soldiers, farmers and other groups. This movement was a failure almost from its inception since it aroused little popular support and invoked the displeasure of the Catholic Church.

Alberto Lleras Camargo, who survived an apparent assassination attempt in January, was elected head of the Liberal party in March. In July, in Benidorm, Spain, Lleras signed an agree-

ment with Colombia's most influential Conservative, Laureano Gómez, calling for the unification of Liberals and Conservatives against Rojas Pinilla. This pact was thought to be a major factor in the September resignation of Rojas Pinilla's entire cabinet. The president reappointed the four military members and filled the remaining nine vacancies with comparatively unknown Conservative civilians.

A downtown section of the city of Cali was rocked by the explosion of seven truck loads of dynamite and munitions which claimed the lives of more than 1,200 people and caused perhaps \$40,000,000 damage.

On Oct. 11, Rojas Pinilla called the National Constituent assembly into session for the first time in two years. Although called principally for

the purpose of making into law the decrees promulgated by the government, the delegates unleashed violent attacks on Rojas Pinilla and his government and moved that Laureano Gómez be reelected in the assembly. These happenings were widely publicized by the press which enjoyed a long-unaccustomed freedom from censorship.

No small part of Rojas Pinilla's political difficulties stemmed from his economic policy. Although enjoying relatively high coffee prices, Colombia's foreign trade debt in October was approximately \$345,000,000; the peso had fallen from the free market rate of 3.75 per dollar in Oct. 1955 to 5.12 per dollar in Oct. 1956; and reserves had declined to a dangerous low of \$91,000,000. As a result, Colombia's credit rating was greatly damaged and the progress of industrialization and of transportation development was slowed. (R. HN.)

Education.—In 1954 a total of 16,784 schools reported 1,293,606 students and 44,467 teachers. Reporting schools included 14,744 primary schools with 1,125,350 students and 28,939 teachers; 620 secondary schools, 69,947 students; 218 commercial schools, 17,379 students; 99 normal schools, 9,869 students. There were 28 universities comprising 8 faculties and 22 institutes and schools of higher learning with a total of 11,996 students and 2,449 teachers.

Finance.—The monetary unit is the peso, valued at 39.84 cents U.S. currency, basic rate, during 1956 and at 20.24 cents, free rate, on July 31, 1956. The national budget for 1956 totalled 1,331,472,000 pesos. Actual revenue in 1955 (including proceeds of loans) was 2,304,619,500 pesos; expenditure was 2,264,609,000 pesos. The internal debt on May 31, 1956, was 443,313,000 pesos and the external debt (excluding interest) the equivalent of 211,053,000 pesos. The U.S. department of commerce estimated U.S. direct private investments in 1955 at \$272,000,000, of which \$105,000,000 represented petroleum investments. Currency in circulation (April 30, 1956) totalled 652,000,000 pesos; demand deposits, 1,385,000,000 pesos.

Trade and Communications.—Exports in 1955 (excluding gold) totalled 1,459,742,000 pesos; imports, 1,678,153,000 pesos. Leading exports were coffee (83%), petroleum (11%) and bananas (3%). Leading customers were the U.S. (74%), Germany (8%), the Netherlands Antilles (5%), Sweden (2%) and the Netherlands (2%); leading suppliers, the U.S. (63%), Germany (10%), the U.K. (4%), France (3%) and Canada (3%).

Railroads (1954) totalled 1,854 mi.; in 1955, they carried 11,010,952 passengers and 5,026,799 metric tons of freight. **Highways** (1954) totalled about 15,365 mi. Registered motor vehicles (Jan. 1, 1955) included 58,761 automobiles, 58,007 trucks and 10,542 buses. In 1955 national air lines carried 1,090,408 passengers and 125,096 tons of cargo. **Telephones** (Jan. 1, 1955) numbered 143,501.

Agriculture.—Coffee production in the 1955-56 season (preliminary figures) totalled 7,200,000 bags of 132 lb. each. Exports in 1955 were 5,867,229 bags, of which 4,800,444 bags went to the U.S. and 419,121 bags to Germany. Preliminary production estimates for other crops in 1955-56 included rice (rough) 650,000,000 lb.; cotton 103,000 bales of

oo lb. gross weight; sugar (centrifugal) 284,000 metric tons; sugar (panela) 600,000 tons; wheat (1954-55) 146,000 tons; maize (1954-55) 13,000 tons; cacao 28,660,000 lb.; tobacco (year 1955) 65,036,000 lb. banana exports in 1955 were 9,154,709 stems, of which 4,146,451 stems went to Germany and 2,671,582 stems to the U.S. In 1951 there were an estimated 15,512,000 cattle, 2,782,000 hogs, 1,298,000 horses, 1,339,000 sheep and 637,000 goats.

Manufactures.—According to the 1953 census of manufacturing industries Colombia had 8,217 manufacturing enterprises (5 or more workers) with 152,106 employees and annual gross production valued at 3,267,400 pesos. Most important by value of production were foodstuffs (2%), beverages (12%), textiles (11%), shoes and apparel (8%) and chemicals (5%). Production (1955) included cement 1,045,537 metric tons and electric energy (primarily for public use) 1,179,600,000 kwhr.

Minerals.—Production in 1955 included gold 380,826 troy oz.; silver 12,037 oz.; platinum (exports) 27,526 oz.; terrestrial salt 175,134 metric tons. Crude petroleum production was 39,711,000 bbl.; exports were 25,10,251 bbl., of which 12,074,315 bbl. went to the Netherlands Antilles (for refining) and 8,276,465 bbl. to the U.S. Refined products included 29,000 bbl. of gasoline and 6,978,000 bbl. of fuel and diesel oil.

(J. W. Mw.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Colombia and Venezuela* (1945).

Colorado. A Rocky mountain state in the west central part of the United States. Colorado has a mean elevation above sea level of 6,800 ft., the highest of any state in the nation. Admitted to the union in 1876 as the 38th state, it is generally known as the "Centennial state" in celebration of the 100th anniversary of the signing of the Declaration of Independence. The area of 104,247 sq.mi. includes 325 sq.mi. of water. The United States owns 34.5% of the total land area and 59.3% is privately owned. The remainder belongs to state, county and municipal governments.

The U.S. bureau of the census population estimate for Colorado as of July 1, 1956, was 1,612,000. The 1950 census figure was 1,325,089. Of the population 62.7% is urban; 37.3% rural; 4.4% native white; 4.5% foreign-born white; 1.5% Negro; 1.6% other. The capital, Denver, had a 1950 population of 415,000. The Denver 1955 estimate was 498,000. Other large cities (1950 census) are Pueblo, 63,685; Colorado Springs, 45,427; Greeley, 20,354.

History.—The 1956 second regular session of the 40th general assembly convened in Denver Jan. 4, 1956, and adjourned Feb. 10, 1956. Several notable bills were passed. House bill 65 created a new division of rehabilitation for the blind to provide industrial education, vocational training and employment of blind persons. Because of exceptionally dry conditions of the past several years, house bills 82 and 126 were of interest. The first provided an appropriation of \$100,000 for investigation, surveys and studies of water resources and their use, with particular reference to the Colorado river basin. Part of the funds were designated for the closed basin project in the San Luis valley. House bill 126 provided funds to the state engineer for new surveys on the various mountain watersheds of the state. Since almost all of Colorado's water supply comes from snow, these surveys would aid in planning future water use.

News events of national and international importance included: Pres. Dwight D. Eisenhower's heart attack during his vacation in Denver. His hospitalization at the Fitzsimmons army hospital in Denver caused much concern to the world. New plans for the Air Force academy were released after the first plans met with much public opposition. Eighty per cent less glass would be used in the new academy which was under construction near Colorado Springs. Gov. Edwin C. Johnson (former U.S. senator) suffered a heart attack which prompted him to withdraw from future political positions.

The principal state officers for the term Jan. 11, 1955, through Jan. 8, 1957 were: Edwin C. Johnson (Dem.), governor; Stephen L. R. McNichols (Dem.), lieutenant governor; George J. Baker (Dem.), secretary of state; Earl E. Ewing (Rep.), treasurer; Homer F. Bedford (Dem.), auditor; Duke W. Dunbar (Rep.), attorney general.

In the Nov. 6, 1956, general election, Colorado voted heavily

in favour of Pres. Dwight D. Eisenhower, but went Democratic in some other important offices. John A. Carroll (Dem.), defeated former governor Dan Thornton in the race for the U.S. senate seat. The following were elected to the principal state offices for the term beginning in Jan. 1957: governor, Stephen L. R. McNichols (Dem.); lieutenant governor, Frank L. Hays (Rep.); secretary of state, George Baker (Dem.); auditor, Earl Ewing (Rep.); treasurer, Homer F. Bedford (Dem.); attorney general, Duke W. Dunbar (Rep.).

Education.—The state appropriation for education in public schools for 1956-57 was \$16,900,000. The school population, including persons from 6 to 21 years of age, was 378,218 as of April 10, 1956. Registered students numbered 324,917. There were 13,562 teachers employed during the 1955-56 school year. From the total appropriation used for state public school education, \$400,000 was scheduled for physically handicapped children; \$1,750,000 classroom unit aid; \$750,000 transportation aid. The 122 county and municipal libraries of Colorado loaned 5,448,780 books, films, records and other library materials to their patrons. The total book stock of Colorado's libraries was 1,845,613 with a total operating expense of \$1,412,738.78, for the fiscal year ending June 31, 1956. H. Grant Vest was state commissioner of education.

Social Insurance and Assistance, Public Welfare and Related Programs.—Disbursements for welfare purposes within Colorado for assistance and administration in the 1955-56 fiscal year amounted to \$74,508,302.12. Payments to, or on behalf of, recipients amounted to \$70,965,026.55, exceeding the 1954-55 expenditure by 7.58%. The old-age pension used 78.64%. The remaining 21.36% was distributed among the other programs in the following order: aid to dependent children, 10.50%; general assistance, 4.45%; aid to needy disabled, 4.71%; tuberculosis hospitalization .66%; aid to the blind .43%; child care .61%.

From Jan. 1 until Aug. 1, 1956, there was an average of 54,419 old-age pension cases per month receiving an average payment of \$86.12 per case; aid to dependent children 5,846 cases, average payment \$109.94; aid to the blind 327 award cases, average payment \$66.17; general assistance 1,878 cases, average payment for subsistence \$43.13; aid to needy disabled 5,062 cases, average payment \$57.93 per case.

There were four correctional institutions with a total of 2,233 inmates as of Sept. 1, 1956. These were divided as follows: boys' industrial school 223; girls' industrial school 108; boys' reformatory 365; and state penitentiary 1,537. The 1956-57 budgets for these institutions were as follows: boys' industrial school \$347,042; girls' industrial school \$221,000; boys' reformatory \$520,071; state penitentiary \$1,556,620. The total budget for all correctional institutions was \$2,644,733.

Communications.—Highways (county, state and federal) as of Jan. 1, 1956, totalled 74,790 mi.; 8,023 mi. were state highways, 62,566 mi. county highways and 4,201 mi. municipal. Total funds for all highway use for 1955 were \$36,013,485.63. There were 459 mi. of highways and 82 bridges constructed during 1955. There were 455 mi. of existing highways resurfaced. There were 14 railroads operating within the state with a total mileage of 4,002 and a valuation of \$136,021,400. Thirty-one telephone companies were in operation with 1,157,284 mi. of wire and a total valuation of \$47,308,580 and 2 telegraph companies, with 76,969 mi. of wire and a total valuation of \$676,500. As of July 31, 1956, there was a total of 548,394 telephones in use that were served by the Bell system. There were 48 standard AM radio stations, 3 FM stations and 11 television stations.

Banking and Finance.—Colorado's 165 federal and state banks reached a high of \$1,598,522,000 in deposits as of Jan. 1, 1956. This represented an increase of \$47,243,887 or 3% over the total deposits of \$1,551,278,113 on Jan. 1, 1955. Building construction in Colorado increased to \$307,826,293 during 1955 from \$265,587,857 in 1954, although the number of building permits remained substantially the same, about 80,000.

The cash balance in the state treasury as of June 30, 1956, was \$58,733,641.30. The total receipts in revenues for the fiscal year ending June 30, 1956, were \$277,995,339.78. The total cost for operating and nonoperating expenditures for the 1955-56 period was \$273,149,498.17. As of June 30, 1956, Colorado had a general fund balance of \$24,458,956.77 which included a \$10,000,000 revolving fund reserved by statute for working capital.

Agriculture.—The cash income from farm marketings through 1955 aggregated \$417,725,000 of which \$274,364,000 resulted from the sale of livestock and livestock products and \$143,361,000 from the sale of crops. Government payments including rental and benefit, soil conservation, agricultural adjustment program, price parity and Sugar act payments amounted to \$10,239,000. Cash farm income and government payments totalled \$427,964,000.

The number of cattle and calves on farms Jan. 1, 1956, was 2,075,000; stock sheep totalled 1,241,000; cattle in feed lots, 235,000; hogs and pigs totalled 195,000 head.

Table I.—Principal Crops of Colorado

Crop	Indicated 1956	1955	Average, 1945-54
Corn, bu.	14,937,000	16,650,000	13,328,000
Wheat, all, bu.	17,164,000	17,257,000	42,984,000
Oats, bu.	2,940,000	4,032,000	5,563,000
Barley, bu.	7,182,000	8,875,000	13,368,000
Rye, bu.	204,000	238,000	341,000
Hay crops, tons.	2,202,000	2,322,000	2,245,000
Dry beans, (100-lb. bags)	1,576,000	1,860,000	1,887,000
Potatoes, cwt.	9,853,000	9,120,000	10,552,000
Sugar beets, short tons.	2,000,000	1,621,000	1,920,000
Sorghum grain, bu.	2,112,000	4,950,000	2,816,000
Broomcorn, tons.	5,000,000	8,100,000	9,010,000
Apples, commercial, bu.	1,505,000	1,210,000	1,273,000
Peaches, bu.	1,830,000	2,110,000	1,762,000
Pears, bu.	240,000	150,000	194,000

Source: U.S. Department of Agriculture.

Table II.—Principal Industries of Colorado

	All employees, 1954	Salaries and wages, 1954	Value added by manufacture, 1954
Food and kindred products	16,870	\$ 61,768,000	\$122,628,000
Primary metal industries	7,808	32,868,000	66,421,000
All industry (including above).	63,154	247,237,000	471,507,000

Source: U.S. Department of Commerce.

Table III.—Mineral Production of Colorado

(In short tons, except as noted)

	1953		1954	
	Quantity	Value	Quantity	Value
Total		\$211,595,000		\$256,970,000*
Clays	778,000	1,430,000	855,000	1,003,000
Coal	3,575,000	19,198,000	2,900,000	16,079,000
Coke†	967,000	?	662,000	?
Copper	3,000	1,688,000	5,000	2,669,000
Feldspar	44,000	268,000	?	?
Fluorspar	53,000	2,872,000	59,000	3,197,000
Gold (oz.)	119,000	4,173,000	96,000	3,365,000
Iron	63,000	233,000	65,000	253,000
Lead	22,000	5,700,000	18,000	4,883,000
Molybdenum	33,851,000	?	?	?
Natural gas (thousand cu.ft.)	28,509,000	1,654,000	45,705,000	3,976,000
Petroleum (bbl.)	36,402,000	98,650,000	46,206,000	127,990,000
Sand and gravel	12,439,000	8,609,000	13,552,000	9,027,000
Silver (oz.)	2,200,000	1,991,000	3,417,000	3,093,000
Stone	884,000	1,751,000	1,804,000	2,112,000
Tungsten concentrates (60% Ws)	800	2,902,000	900	3,421,000
Zinc	38,000	8,696,000	35,000	7,592,000
Other Minerals . . . . .	...	51,780,000	...	69,029,000

*Value has been adjusted to eliminate duplication in the value of clays and stone.

†Values for processed materials are not included in the totals.

‡Value included with other minerals.

Source: U.S. Bureau of Mines.

Manufacturing and Industry.—The University of Colorado Bureau of Business Research estimate of value added to Colorado manufacturers in 1954 was \$471,507,000. There were an estimated 2,100 manufacturing plants operating full-time in Colorado in 1955. Wages and salaries for manufacturing were estimated at \$247,237,000 for 1954.

From Jan. 1, 1956, through Aug. 1, 1956, the monthly employment figures averaged 501,085 employed in nonfarming occupations and 89,755 in farming for a total employment of 590,240 for both farming and nonfarming occupations. The unemployment monthly average for this same period was 16,820 or 2.8% of the total labour force.

Tourist travel in Colorado is the fourth largest industry in the state. As of Sept. 26, 1956, the 1956 estimate from the state advertising and publicity department indicated an all-time high of more than 3,600,000 visitors spending a record \$250,000,000. (H. L. Hy.)

Mineral Production.—Including only those items whose value was \$100,000 or more, Table III shows the tonnage and value of Colorado minerals in 1953 and 1954. Colorado was first in molybdenum and uranium production in 1954, second in fluorspar, third in columbium-tantalum, fourth in lead mined and fifth in zinc mined. The most important of the U.S. uranium areas are in the Colorado plateau which consists largely of Colorado and parts of three adjoining states. It has substantial production of vanadium and in 1954 nearly doubled its 1953 output of columbium-tantalum, and ranked 15th in the value of its mineral output, with 1.84% of the U.S. total.

ENCYCLOPEDIA BRITANNICA FILMS.—The Northwestern States (1955).

Colorado River Storage Project: see UTAH.

Columbia, District of: see WASHINGTON, D.C.

Commerce: see BUSINESS REVIEW; INTERNATIONAL TRADE; TARIFFS.

Commerce, U.S. Department of: see GOVERNMENT DEPARTMENTS AND BUREAUS, U.S.

Commodity Credit Corporation: see AGRICULTURE.

Commodity Prices: see BUSINESS REVIEW; PRICES.

Commonwealth Fund: see SOCIETIES AND ASSOCIATIONS, U.S.

Commonwealth of Nations.

This is a community of independent nations and dependent or semidependent territories bound together by allegiance to the British crown or by recognition of the British sovereign as head of the commonwealth.

Throughout the year 1956 individual members of the commonwealth continued to pursue their various policies of alliance, with one another and with outsiders. India still ranged free, taking pains however to improve cultural and economic relations with other noncommitted areas such as Indonesia. Pakistan, having pondered the reference to Kashmir of the Soviet premier, N. A. Bulganin, as "a northern part of India," and thought over the comments of his colleague N. S. Khrushchev on the nefarious influence of U.S. monopolists, became on adoption of the constitution on Feb. 29 an Islamic republic, as had been predicted. Two days later the decision was taken to remain within the common-

wealth: this, said the then prime minister, Chaudhry Moham Ali, was a decision taken for reasons of "enlightened interest." At the meeting of the SEATO (Southeast Asia Treaty organization) council (March 6-8) held in Karachi, Pakistan brought up the perennial Kashmir question—quite improper in the opinion of India's prime minister, Jawaharlal Nehru, who delivered an attack in the house of the people on March 20 on the whole concept of military pacts in Asia directed by non-African nations. Pakistan riposted to this at a meeting of the Baghdad pact council (April 16-19) that this arrangement, which had its permanent organization, would prove a unifying factor among the peoples in the region who wished to preserve a free democratic way of life. Pakistan welcomed closer co-operation with the United States in schemes of economic assistance. The prime minister also pointedly described the commonwealth on June 25, as a "great mansion of peace," and took the opposite side to India at the London conference which discussed the problem of control of the Suez canal (Aug. 16-23).

In Ceylon, since Dec. 1955 a member of the United Nations, a general election in April unseated Sir John Kotelawala's United National party, which had been 25 years in office, and replaced it with the People's United Front led by S. W. R. D. Bandaranaike, who described his party as a "democratic socialist party, as opposed to the extreme conservative and capitalist character of our opponents." The new prime minister declared his intention to institute a republic, to make Sinhalese the national language (thus setting off considerable rioting) and then to take over U.K. bases at Trincomalee and Katunayake, under Ceylonese rights by legislation of 1947, and make—or not make—facilities available in them to the British.

The Union of South Africa still found scant time for assertion of any international position: indeed, on Nov. 9, 1955, its delegates had walked out of the UN general assembly following passage by that assembly of a 17-power resolution condemning



"ANOTHER KNOT IN THE LION'S TAIL," a 1956 cartoon by Pletcher of Sioux City Journal (la.)

Table I.—Realms and Member-Nations of the Commonwealth, with their Dependencies*

Country	Area (sq.mi.)	Population (1955 est.)	Capital	Status	Governors-general, etc., and prime ministers
Great Britain and Northern Ireland, United Kingdom of . . .	93,895†	51,136,000†	London	Kingdom	Prime Minister, Sir Anthony Eden
Australia, Commonwealth of . . .	2,974,581	8,986,529‡	Canberra	Kingdom; federation of states	Governor-general, Field Marshal Sir William Slim; prime minister, Robert Gordon Menzies
Papua-New Guinea	183,590	1,701,458§	Port Moresby	External territory (Papua) and trust territory (New Guinea)	Administrator, Brig. D. M. Cleland
Norfolk Island	13	942||	—	External territory	Administrator, Brig. H. B. Norman
Nauru	8	3,473||	—	Trust territory	Administrator, R. S. Leydin
Cocos (Keeling) Islands . . .	5	1,000	—	External territory	—
Other islands	159	—	—	External territories	—
Antarctic territory	c.2,472,000	—	—	External territory	—
Canada	3,845,774	15,601,000	Ottawa	Kingdom; federation of provinces	Governor-general, Vincent Massey; prime minister, Louis Stephen St. Laurent
Ceylon	25,332	8,678,000	Colombo	Kingdom	Governor-general, Sir Oliver Goonetilleke; prime minister, S. W. R. D. Bandaranaike
Dia (including Jammu and Kashmir)	1,265,763	381,690,000	New Delhi	Republic; union of states	President, Rajendra Prasad; prime minister, Jawaharlal Nehru
New Zealand	103,740	2,172,350¶	Wellington	Kingdom	Governor-general, Lieut.-Gen. Sir Willoughby Norrie; prime minister, Sidney George Holland
Western Samoa	1,131	94,128§	Apia	Trust territory	High commissioner, G. R. Powles
Other islands	193	23,000	—	External territories	—
Ross (Antarctic Dependency)	c.175,000	—	—	External territory	—
Pakistan	364,737	80,167,000§	Karachi	Federal Islamic republic	Acting president, Maj. Gen. Iskander Mirza; prime minister, H. S. Suhrawardy
South Africa, Union of	472,733	13,669,000	{ Pretoria Cape Town Bloemfontein }	Kingdom	Governor-general, Ernest George Jansen; prime minister, J. G. Strijdom
South-West Africa	317,725	458,000	Windhoek	Mandate	Administrator, D. T. du P. Viljoen
Prince Edward and Marion islands	103	—	—	External territories	—

† Excluding U.K. dependencies; see Table II. ‡ Including for census purposes Isle of Man and Channel Islands, not part of legislative area of U.K.; see also Table II. § 1954 census. || 1954 census. ¶ 1956 preliminary census.

Excludes full-blooded aboriginals (1947 est.), 46,638. § 1954 est. ¶ 1954 census. ¶ 1956 preliminary census.

Table II.—United Kingdom Dependencies

Country	Area (sq.mi.)	Population (1955 est. in '000s)	Capital	Status	Rulers, governors, prime ministers, etc.
EUROPE					
Danish Islands	45 }	100	St. Helier	Crown dependency	Lt. Gov., Adm. Sir R. S. Gresham Nicholson
Guernsey and dependencies	30 }		St. Peter Port	Crown dependency	Lt. Gov., Air Marshal Sir Thomas Elmhirst
Jersey	221	56	Douglas	Crown dependency	Lt. Gov., Sir Ambrose Dundas
Malta	2	25	—	Colony	Gov., Lt. Gen. Sir Harold Redman
Malta (including Gozo and Comino)	122	314	Valetta	Self-governing colony	Governor, Sir Robert Laycock Prime minister, Dominic Mintoff
ASIA					
Bahrain (including dependencies)	c.112,108	1,079*	Aden	Colony and protectorate	Governor, Sir William Luce
North Borneo	29,388	368†	Jessellton	Colony	Governor, R. E. Turnbull
Brunei	2,226	56	Brunei	Protected sultanate	Sultan, Omar Ali Saifuddin High commissioner, Sir Anthony Abell
Kuching	47,071	605†	Kuching	Colony	Governor
Nicosia	3,572	520	Nicosia	Colony	Governor, Field Marshal Sir John Harding
Hong Kong	391	2,340	Victoria	Colony	Governor, Sir Alexander Grantham
Federation of Malaya	50,690	6,152	Kuala Lumpur	Federation of 2 British settlements and 9 protected states	High commissioner, Sir Donald MacGillivray
Maldives (Maldiva)	115	89	Male	Protected sultanate	Chief minister, Tengku Abdul Rahman Sultan, Mohamed Farid Didi
Singapore (including dependencies)	287	1,167†	Singapore	Colony	Prime minister, Ibrahim Ali Didi Governor, Sir Robert Black Chief minister Lim Yew Hock
AFRICA					
South African Territories (High Commission Territories)					
Tswana	11,716	590	Maseru	Colony	Resident commissioner, G. Chaplin
Bechuanaland Protectorate	274,517	296	—	Protectorate	Resident commissioner, M. O. Wray
Nyasaland	6,704	217	Mbabane	Protectorate	Resident commissioner, D. L. Morgan
Egypt	4,003	285	Bathurst	Colony and protectorate	Governor, Sir Percy Wyn-Harris
Sierra Leone Coast	91,843	4,620	Accra	Colonies, protectorate and trust	Governor, Sir Charles Arden-Clarke; prime minister, Kwame Nkrumah
Ivory Coast	223,478	6,048	Nairobi	Colony and protectorate	Governor, Sir Evelyn Baring
Kenya (including dependencies)	805	566	Port Louis	Colony	Governor, Sir Robert Scott
Cameroon Federation of States (including Cameroons trust)	373,250	32,780	Lagos	Federation of 3 regions and 2 federal territories	Governor-general, Sir James Robertson
Rwanda and Nyasaland, Federation of	489,854	7,257‡	Salisbury	Federation of 2 protectorates and a self-governing colony	Governor general, Lord Ullswater; prime minister, Viscount Malvern
Zimbabwe Rhodesia	290,323	2,130	Lusaka	Protectorate	Governor, Sir Arthur Benson
Nyasaaland	49,177	2,540	Zomba	Protectorate	Governor, Sir Robert Armitage
Northern Rhodesia	150,354	2,399	Salisbury	Self-governing colony	Governor, Vice-Adm. Sir Peveril Williams-Powell; prime minister, R. S. G. Todd
Swaziland (including dependencies)	119	5	Jamestown	Colony	Governor, Sir James Harford
Trinidad and Tobago	156	39	Victoria	Colony	Governor, Sir William Addis
Sierra Leone	27,926	2,050	Freeport	Colony and protectorate	Governor, Mr. Dorman
Papua New Guinea	67,997	640	Hargeisa	Protectorate	Chief minister, M. A. S. Margai
Yemen	362,688	8,324	Dar-es Salaam	Trust	Governor, Sir Theodore Pike
Omani	93,981	5,508	Entebbe	Protectorate	Governor, Sir Edward Twining
Zanzibar (including Pemba).	1,020	278	Zanzibar	Protected sultanate	Governor, Sir Frederick Crawford Sultan, Sir Khalifa bin Harub Resident, H. S. Potter
AMERICA					
American Samoa	4,404	94	Nassau	Colony	Governor, Earl of Ranfurly
Virgin Islands	166	230	Bridgetown	Colony	Governor, Brig. Sir Robert Arundell Premier, G. Adams
British Honduras	21	40	Hamilton	Colony	Governor, Lieut. Gen. Sir John Woodall
French Guiana	82,997	485	Georgetown	Colony	Governor, Sir Patrick Renison
Suriname	8,867	78†	Belize	Colony	Governor, Sir Colin Thornley
Andorra	4,618	2	Stanley	Colony	Governor, Q. R. Arthur
Spain (including dependencies)	4,708	1,550	Kingston	Colony	Governor, Sir Hugh Foot; chief minister, Norman Manley
Faroe Islands	422	126†	St. John's	Colony	Governor, Sir Kenneth Blackburne
Madagascar	1,980	698	Port of Spain	Colony	Governor, Sir Edward Beetham
Reunion Island	821	306†	St. George's	Colony	Governor, C. M. Deverell
AUSTRALASIA					
New Zealand	7,085	345	Suva	Colony	Governor, Sir Ronald Garvey
Tonga (Friendly Islands)	270	54†	Nukualofa	Protected kingdom	Ruler, Queen Salote Tupou; premier, Crown Prince Tungi
Western Pacific High Commissioner excl. New Hebrides	11,869	143	Honiara	Colony and protectorate	High commissioner, John Gutch
New Hebrides	5,700	53	Vila	Anglo-French condominium	British resident commissioner, J. S. Rennie
Including Perim Islands	↑1954 est.	↓1956 est.			

apartheid as a policy, and they did not return until the autumn of 1956. At home, the Union government consummated its four-year struggle to obtain a remodelled senate. In the enlarged body, 77 out of the 89 members were Nationalists. The party was thus enabled to command 171 votes in a two-thirds majority of both houses in joint session, 5 more than was needed in order to amend the "entrenched clauses" of the Union act of 1909. As a result, the Separate Representation of Voters act was passed in joint session on Feb. 27, removing the coloured voters in Cape Province from the common roll.

In Australia Liberal-Country party coalition under the prime minister, Robert Menzies, increased its majority after the election of Dec. 1955 and faced the country's growing balance-of-payments problem. Australia budgeted to spend £A200,000,000 on its military obligations to the ANZUS and SEATO pacts, increased federal taxation and on June 28 cut imports by a further £A40,000,000, thus dealing a sharp blow at the export trade of the United Kingdom.

Canada's assertion of national and international status made great headway during the year. Still soaring on a tide of economic prosperity, it was able to provide an atomic reactor plant for India under the Colombo plan, and undertook to contribute \$26,000,000 in technical assistance under the plan for the seven years from April 1956—a figure comparing remarkably with the £7,000,000 set aside for this purpose by the United Kingdom.

At the seventh postwar conference of commonwealth prime ministers held in London (June 28–July 6) the communiqué placed unusual emphasis on the need to bring about disarmament, to raise living standards and to promote economic co-operation. The communiqué also reaffirmed commonwealth interest in the peace and stability of the middle east. In this theatre Menzies' words were soon given substance. The last U.K. forces in Egypt left Port Said on June 13. On July 26 Gamal Abdel Nasser, the Egyptian president, nationalized the Suez Canal company. The United Kingdom, after consultation with the French and U.S. governments, summoned a conference in London of canal users, and Menzies was deputed to lead a five-man committee, including a Pakistani delegate, to Cairo to lay before Nasser the views of 18 nations. India's alternative plan, that the canal should in fact be operated by Egypt assisted by an international advisory body representing the users, was supported by Ceylon. Canada did not attend the London conference, but commonwealth opinion rallied on the whole to the U.K. view that the canal was too vital a link to be left exclusively in Egyptian hands. None the less the U.K. action, taken conjointly with France, in attacking Egypt on Oct. 31, followed by an Anglo-French invasion of the canal zone on Nov. 5, caught both the commonwealth and the United States off balance. India condemned it; Pakistanis rioted in Karachi; Canada disowned it; Australia did not support the United Kingdom's use of the veto in the UN Security council, but Menzies shortly afterward spoke in favour of the Anglo-French action in Egypt; and S. G. Holland, prime minister of New Zealand, said he had full confidence in the United Kingdom's intentions in moving forces into the canal zone. Canada took a leading part in suggesting that an international police force should be sent to the Suez area to keep "the borders at peace."

(A. P. T.)

ENCYCLOPEDIA BRITANNICA FILMS.—Ceylon (1955); Hong Kong (1955); India (1955); India (Pakistan and the Union of India) (1952); Pakistan (1955); Singapore (1955); Union of South Africa (its land and its people) (1956).

Communism.

The year 1956 was one of the most eventful in the almost four decades of communist history since Nicolai Lenin overthrew the short-lived democratic regime in Russia in 1917. The 20th congress of the Communist party of the Soviet Union, which met in Feb. 1956 in Moscow,

concluded definitely, and even violently, the Stalin period in the history of communism. It officially proclaimed a return to Lenin. This in no way implied a liberalization of the regime for Lenin was completely dedicated to the idea of a communist world revolution and of the necessity of an implacable class war, and his successors remained faithful to this idea. Yet in 1956 they had to liquidate the Stalinist heritage of an unbelievable lawlessness, brutality and self-glorification, and this liquidation the memory of a man who had been praised to the sky and raised far above all other human beings by necessity brought confusion into the ranks of the communists, especially outside the Soviet Union.

The 20th Party Congress.—Three months before the party congress, at the celebration of the 38th anniversary of the communist revolution, L. M. Kaganovich, the government's spokesman for the occasion, told the audience of the fervent Bolshevik faith in the ultimate triumph of world revolution, but he also emphasized that the revolution would not be imposed from without. He upheld the new conciliatory foreign policy of the Soviet Union—the Austrian state treaty, the establishment of diplomatic relations with west Germany, the return of the Porkkala base to Finland, the reduction in Soviet armed forces and the new friendship with India and Burma—but declared that these actions did not stem from Soviet weakness but from the consciousness of growing strength and power.

The same confident tone characterized the address by N. S. Khrushchev, the secretary-general of the party, delivered before the party congress on Feb. 14. He emphasized the need of strengthening friendship with Asia, and he tried to promote dissension in the western alliance. He and A. I. Mikoyan, a first deputy premier, condemned strongly the "cult of personality" and deplored the distortion of recent history and the unjust accusations against early Bolshevik leaders committed under Stalin. Another important change was the new emphasis put upon Yugoslavia and its brand of independent communism, in contradiction to the attitude in Stalin's later years. The party congress unanimously endorsed the new policy, as unanimously and outwardly as enthusiastically as previous congresses had endorsed Stalin's policy. No step toward even the first growth of democracy was visible. Yet in a long secret report submitted by Khrushchev to a closed session of the congress and published later by the United States department of state, Stalin's crimes against his communist associates were openly acknowledged.

Khrushchev's Secret Report.—Though the report castigated Stalin's murdering of thousands of leading communists, it was silent about the greater crimes committed by Stalin against the peoples in the Soviet empire, including the Russian people. Nor did Khrushchev's condemnation of Stalin's despotism change in the slightest the one-party dictatorship with a self-perpetuating ruling group at its centre, responsible to nobody. Yet Khrushchev went so far as to accuse Stalin of practising "brutal violence" not only toward everything which opposed him, but also toward that which seemed, to his capricious and despotic character, contrary to his concepts. Whoever opposed this concept . . . was doomed to moral and physical annihilation." Khrushchev cited many examples of cruel arbitrariness. The question which Khrushchev did not answer, and which his audience did not ask, was about the validity of a system which made such unbelievable governmental excesses possible and veiled them for many years in a cloud of the most exaggerated praises of governmental policy and leadership ever known in history.

As a result of Khrushchev's speech a large number of leading communists who had been executed or who had disappeared were restored to honourable positions in the history of communism now being again rewritten to fit the demands of the present leadership. Others were released from prison. The government

even approved campaigns in the Soviet press against the great Russian chauvinism manifested in the treatment of the non-Russian nationalities, and against "the vicious and harmful practice" of Soviet historians in exaggerating Russian successes and concealing Russian weaknesses. The Soviet government even went so far as to publish Lenin's criticism of Stalin, which Stalin had previously suppressed and which had not been made public before, though it was known outside the Soviet Union. These revelations created a great unrest in the Communist party, not so much in the U.S.S.R., where all expressions of public opinion continued to be strictly controlled, but among communists abroad. On July 2 the central committee of the Soviet Communist party was obliged to publish a lengthy announcement justifying the anti-Stalin campaign on the one hand and the Soviet system on the other hand.

Communism in Ferment.—Outside the Soviet Union the 20th congress of the Soviet Communist party produced great fermentation among communists. This fermentation was strongest in Poland and in Italy, yet it made itself felt also in other satellite countries with the exception perhaps of Rumania and Bulgaria. In the Soviet Union itself, *Pravda*, the official communist organ, stressed on April 5 the limits of any criticism allowed and emphasized that the party line and the party leadership were beyond discussion. Another editorial on July 6 acclaimed the one-party system and the strictly centralized rule even of thought in communist society. Iron discipline and absolute subordination were demanded of the Soviet workers. But it was more difficult to enforce this position abroad. Even in the Soviet Union there was unrest in Georgia, where apparently many Georgians remained faithful to the glorification of Stalin, their fellow-Georgian. In the satellite countries many of the communist leaders exalted on Stalin's orders were rehabilitated. Among them were Laszlo Rajk in Hungary and Traicho Kostov in Bulgaria. It had now become official Moscow policy to be friendly with Yugoslavia, and therefore "Titoism" had ceased to be a crime. The rehabilitation of Rajk and Kostov went a long way to make a re-union of Hungarian-Yugoslav and Bulgarian-Yugoslav relations possible.

The change in Poland went far more deeply. With a liberty unknown in other communist lands, Polish intellectuals and writers demanded greater freedom of thought and expression. The intellectual unrest was increased by the grave economic crisis under which the country suffered, and led to a violent demonstration of Polish workers in the industrial city of Poznan on June 28. The official communist organs admitted that excessive demands had been made on the workers since the war and called for a more democratic economic program in which a greater share of profits would go to the workers. But the demonstrators not only demanded economic betterment; they also shouted for a freer press. Developments in Poland went so far that the demonstrators at Poznan were tried in September and October in fair and open trials, the like of which had never been seen in communist lands; and the Polish Communist party announced in a statement at the end of July that it was stepping out from the direct management of the nation's affairs and would provide only "political inspiration" for the government.

Communism in Crisis.—The turn in Polish affairs came on Oct. 19, when Wladyslaw Gomulka, who was imprisoned in 1951 at Stalin's order as the Polish "Tito" and was released only in 1956, was elected to the central committee of the Polish Communist party; on Oct. 21 he became a member of the Polish Politburo. Under his leadership Polish nationalist communists prevailed. The military alliance between the U.S.S.R. and Poland was maintained, but Marshal Konstantin Rokossovsky was replaced as Polish minister of defense by Gen. Marian Spychalski, a close friend of Gomulka and like him long imprisoned as a

Titoist. A statement signed by Soviet and Polish communist leaders on Nov. 18 confirmed important political, economic and military gains for Poland and put the two nations on a new footing. The new Polish government also established better relations with the Polish Catholics, and Stefan Cardinal Wyszynski was set free. (See also POLAND.)

A similar attempt to put Hungarian-Russian relations on a new footing failed. Imre Nagy, who had been expelled from the Communist party as a "rightist," was readmitted on Oct. 15, and on Oct. 24 he replaced Andras Hegedus as premier. The next day he dismissed Erno Gero as first secretary of the party and re-

Membership of the Communist Parties

1. Countries of the Communist bloc	
China (Sept. 1956)	10,734,384
U.S.S.R. (Feb. 1956)	7,215,505*
Czechoslovakia (June 1954)	1,489,234†
German Dem. Rep. (1955)	1,300,000
Poland (March 1954)	1,296,938
North Korea (Jan. 1956)	1,164,945
Hungary (May 1954)	864,607‡
Rumania (Dec. 1955)	595,398§
Bulgaria (Feb. 1954)	455,251||
North Vietnam (1955)	120,000
Albania (April 1956)	48,644
Mongolia (March 1956)	35,000
2. Yugoslavia	
League of Communists of Yugoslavia (March 1956)	624,806
3. Some Noncommunist countries	
Europe	
Italy (Jan. 1955)	2,145,317
France (Oct. 1956)	30,000
German Fed. Rep. (1956)	70,000
Austria (1955)	60,000
Finland (1953)	50,000
Great Britain (March 1956)	33,959
Greece (1953)	30,000
Sweden (1953)	28,000
Belgium (1953)	25,000
Netherlands (1953)	25,000
Denmark (1953)	21,000
Norway (1953)	13,000
Asia	
Indonesia (1956)	500,000
Japan (1954)	100,000
India (1953)	95,000
Iran (1954)	20,000
Malaya (1953)	30,000
North America	
Philippines (1953)	15,000
Lebanon (1955)	10,000
Syria (1956)	10,000
Egypt (1955)	8,000†
Israel (1955)	5,000
Iraq (1955)	4,000†
South America	
United States (1956)	25,000†
Cuba (1954)	30,000†
Canada (1950)	15,000
South America	
Brazil (1954)	60,000†
Argentina (1954)	40,000
Chile (1954)	40,000†
Venezuela (1954)	20,000†
Uruguay (1954)	15,000
Peru (1954)	10,000
Australasia	
Australia (1953)	10,000

*Including 419,609 candidates. †Including 103,624 candidates. ‡Including 54,380 candidates. §Including 56,583 candidates. ||Including 87,109 candidates. †The Communist party is banned.

placed him with Janos Kadar, who had spent three years in a concentration camp as a "Titoist." Yet the Hungarian people, students and workers demanded much more—a real democratization of the regime, the abandonment of the military alliance with the U.S.S.R., and Hungarian neutrality. Nagy was willing to comply and appealed to the United Nations, but on Nov. 4 the Soviet army took the counteroffensive and installed a new government under Kadar, accusing Nagy of having "betrayed" the revolution by giving in to "reactionaries." Kadar, in spite of his promise to establish full equality with the U.S.S.R. and to follow a "Hungarian" road to "socialism," failed to win public confidence. Hungarian resistance was put down by the Soviet army, and a general strike of the Hungarian workers paralyzed Hungary's life.

In Yugoslavia Marshal Tito followed the Polish and Hungarian attempts to change the relationship between the U.S.S.R. and its satellites with greatest sympathy for the satellites, yet he objected to Hungarian attempts to replace communism by a democratic system. The relationship between Moscow and Belgrade deteriorated during November, especially after Imre Nagy, who had taken refuge in the Yugoslav embassy in Budapest, was abducted by Soviet forces and exiled to Rumania. The Russian action in Hungary aroused widespread protests not only in the United Nations but also among procommunists in the western countries. Among the satellites, Titoist influence seemed to be gaining as against that of Moscow.

Communism in Italy.—The most powerful Communist party outside the Soviet orbit was the Italian party. On June 16 Palmiro Togliatti, first secretary of the Communist party, criticized not only Stalin but the present Soviet leaders for helping build up the Stalin myth. He called upon them to explain how Soviet society could and did arrive at certain forms which were not only far removed from legality but were open signs of degeneration. A few days later, the leader of the Italian Socialist party, Pietro



"WHAT'S OUR POLICY TODAY, COMRADE?!" a cartoon of 1956 by Fletcher of the *Sioux City Journal* (la.)

Nenni, who so far had followed the communist line and was a faithful ally of the communists in Italy, continued Togliatti's attack against Moscow and went far beyond it. Nenni demanded the introduction of democracy into the Soviet Union, with freedom of political speech and ideas. By the end of the year Nenni severed his close alliance with the communists and conducted negotiations for co-operation with the democratic wing of the Socialists under the leadership of Giuseppe Saragat, a determined opponent of all forms of dictatorship. In October an Italian communist delegation under Luigi Longo, the second in command among the Italian communists, visited Yugoslavia. In a lengthy interview Longo hailed the example of Yugoslavia without once mentioning that of the Soviet Union. This action bore testimony not only to changes in the Italian Communist party line but also to the enhanced position and prestige of Yugoslavia in the communist world.

Yugoslavian Communism.—During 1956 the Soviet leadership continued its policy of "appeasing" Marshal Tito. As a gesture in that direction, the Cominform, a Soviet-led coalition of the Communist parties of the satellite countries and of those of Italy and France, was dissolved in April. The Cominform (Communist Information bureau), established in Wilcza Gora, Pol., in 1947 as a successor to the Communist International which was dissolved in 1943, became in 1948 the chief Stalinist instrument of anti-Tito agitation. Now it was dissolved, probably at Tito's behest, at the very time when in most satellite countries the old anti-Tito leadership was removed from control. Tito's influence seemed to strengthen in the satellite countries the trend toward greater independence from Moscow, a trend which was in no way welcome to the Kremlin leaders. He visited the U.S.S.R. in June and pleaded for a new relationship between Moscow and the Communist parties outside the Soviet Union. The question, however, seemed not to be entirely clarified; for this reason Khrushchev visited Yugoslavia in September to confer with Tito, and

Tito went later to a Black sea resort to continue his conference with Soviet leaders. The chief point at issue was the new post-Stalinist and even anti-Stalinist theory that there were different roads to the realization of communism and that the road travelled by Moscow was in no way binding upon the communists in other countries.

Communism in Other Lands.—Though the Communist party in the United States is without any importance in numbers and influence, it was nevertheless significant for the trend of the time that the party issued in September a long statement confessing past errors and proposing far-reaching reforms. It asserted that it discarded as obsolete the theses held by Lenin and Stalin that war was inevitable under capitalism and that a violent proletarian revolution was indispensable for the realization of socialism. The statement pointed out that the party had been entirely unprepared for, and deeply shocked by, Khrushchev's revelations regarding Stalin. The statement was to be submitted to a national convention called for Feb. 1957, the first such convention since 1950. The present membership of the party was given as "somewhat between 20,000 and 25,000."

In other countries, outside the United States, communist influence was not negligible. In fact, as a result of a more flexible and outwardly conciliatory foreign policy of the U.S.S.R., this influence was growing, especially in Asia.

The Suez canal crisis gave the Soviet Union an opportunity of playing the role of friend and champion of Egypt and of the whole Arab world. The state visit paid by Nikolai A. Bulganin and Nikita S. Khrushchev to India and Burma in the late fall of 1955 established extremely cordial relations with these countries. The new friendship of Moscow's leaders for Jawaharlal Nehru made the position of the Communist party in India more difficult. It continued to attack Nehru and to be attacked by him on domestic issues. In Indonesia Pres. Achmed Sukarno favoured close co-operation with the communists, but he was forced to accept a cabinet which excluded communists. In Burma the communists more than tripled their representation in parliament in the election held at the end of April. In Ceylon the communists did not make any gains but the elections resulted in the victory of a neutralist party instead of a pro-western governmental party. Similarly, in Iceland, as result of elections held in July, a new leftist government was formed in which the communists received one-third of the cabinet seats. The formation of the new government meant an increase in trade with communist countries and growing determination to oust United States NATO forces from the island.

In Sept. 1956 the Chinese Communist party held its first party congress in 11 years. Following the general line of the moment, Mao Tse-tung spoke about an easing of the world situation but gave full support to all "anti-imperialist" and "anti-capitalist" movements and trends throughout the world.

Relaxation in World Tension?—A number of small steps were taken which signified some relaxation of world tensions. The United States and the Soviet Union arrived at an agreement according to which official publications of the two governments would be made accessible to the citizens of the other country. A magazine, *Amerika*, in Russian, was produced by the United States government for distribution in the U.S.S.R., and a similar Soviet-produced magazine in English was made available in the United States. The first edition of the Russian Bible since the Bolshevik revolution was published at the beginning of 1957 by the Moscow patriarchate of the Russian Orthodox Church. Trade between the communist bloc and the rest of the world rose by 24% in 1955. A communist economic offensive was especially noticeable in underdeveloped countries. The number of Soviet bloc exhibits in trade fairs jumped from 125 in 1954 to 288 in 1955.

However, the suppression of the Hungarian movement for liberty by the Soviet army aroused sharp indignation abroad and in the United Nations. And already in March 1956 the democratic Socialist International had rejected all communist overtures for co-operation. "We believe in democracy; the Communists don't," the statement read. "We believe in the rights of men; they mock them. This is not changed by the refutation of Stalinism. Repudiation by those who whether in fear for their lives or in genuine complicity previously helped in Stalin's crimes and praised his sins has not fundamentally altered the character of the Communist regime. Even with collective leadership it yet remains a dictatorship."

(See also CIVIL RIGHTS; DEMOCRACY; EDUCATION; FEDERAL BUREAU OF INVESTIGATION; SOCIALISM; and articles on the various countries.)

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Community Chest–United Fund. Community Chest has been for many years the name given to a local fund-raising federation representing voluntary health, welfare and recreation agencies, major contributing groups and individual citizens in nearly 2,000 communities in the United States. Since 1950 nearly half these chests have enlarged their scope to become "united funds" which include in their annual campaigns funds not only for local services but also for national causes such as the American Red Cross, heart, cancer, mental health and crippled children funds. During these years united campaigns also extended their geographical boundaries beyond city limits to include outlying communities in one united appeal for metropolitan or county areas.

Associated with or a part of the chest or united fund in most cities is the community welfare council, the purpose of which is to co-ordinate the services of its member agencies and to provide machinery for community-wide study and planning of health, welfare and recreation services, both voluntary and tax-supported.

Federated planning and fund raising are designed to (1) achieve co-ordination of health and welfare services, national and local; (2) substitute teamwork for competition in fund raising, with resulting economies in campaign costs; (3) distribute funds fairly, according to community needs and proportionate responsibility; (4) account to the public for every dollar raised; and (5) stimulate active participation by local citizens in health and welfare matters.

The national association of local chests, united funds and councils is United Community Funds and Councils of America, Inc. (formerly Community Chests and Councils of America), which was established in 1918.

National promotion on behalf of local campaigns is carried on under the name of United Community Campaigns of America.

Of the 2,524 community chests, united funds and welfare councils in operation in July 1956 (2,063 chests and funds and 461 councils), 1,994 chests and funds and 434 councils were in the U.S., 69 chests and 27 councils in Canada. The chest and council idea has also been adopted in the British West Indies, Japan, the Philippines, the Panama Canal Zone, Cuba, Greece, Australia

and Mexico.

In 1955 more than 26,300,000 contributions totalling \$339,206,067 were made through chests and united funds. United funds accounted for \$200,000,000 of this sum.

Officers of United Community Funds and Councils of America, Inc., for 1956 were: honorary president, Gerard Swope (New York city); president, James A. Linen (Greenwich, Conn.); treasurer, G. Warfield Hobbs (New York city); secretary, Vincent B. Coffin (Hartford, Conn.); vice-presidents, John A. Greene (Cleveland, O.), Joseph A. Beirne (Washington, D.C.), Ray R. Eppert (Detroit, Mich.), Peter Howard (Oakland, Calif.), Ralph H. Blanchard was executive director. Headquarters are at 345 East 46th street, New York 17, N.Y. (B. A.)

Community Planning: see BUILDING AND CONSTRUCTION INDUSTRY; MUNICIPAL GOVERNMENT; TOWN AND REGIONAL PLANNING; URBAN TRANSPORTATION, U.S.

Community Trusts. Aggregate holdings of \$158,573.803 were reported by community trusts in the United States and Canada at the beginning of 1956. During 1955, these composite charitable foundations appropriated \$6,707,422 and received incoming resources totalling \$11,220,281.

The largest of these organizations was the New York (N.Y.) Community trust, whose 111 funds were valued at \$26,837,388. The Cleveland (O.) foundation reported resources of \$19,027,780; Permanent Charity fund, Boston, Mass., \$14,052,427; Chicago (Ill.) Community trust, \$13,835,831; and California Community foundation, Los Angeles, \$10,752,986. The New York Community trust disbursed \$1,146,688 in 1955; Cleveland foundation, \$764,831; Chicago Community trust, \$749,321 and Permanent Charity fund (Boston), \$621,386.

Funds newly received in 1955 included \$3,837,621 reaching the Hartford (Conn.) foundation; \$1,625,041 added to the Chicago Community trust; \$776,600 given to the Minneapolis (Minn.) foundation; \$729,689 to the Vancouver (British Columbia) foundation; and \$724,206 accruing to the New York Community trust. Of 75 community trusts surveyed in 1955, 73 were administering principal resources and 66 were making current distributions out of 1,301 funds on hand. Their cumulative disbursements in the 20 years from 1936 through 1955 stood at \$62,028,508.

A community trust consists, usually, of a series of trust funds of varied sizes, held by corporate trustees and applied for charitable uses under the central supervision of a joint distributing committee. The trustee of a given fund is ordinarily chosen by its founder. The custody and investment of any particular fund are the responsibilities of its trustee. The distributing committee authorizes all disbursements by the trustee and, in so doing, customarily undertakes to give expression to any specific charitable desires of a founder but is also empowered to take appropriate remedial action if originally expressed preferences later become impossible or impractical of execution.

(R. Hs.)

Comoro Islands: see FRENCH UNION.

Compensation, Veterans': see VETERANS ADMINISTRATION (U.S.).

Confectionery: see CANDY.

Congo, Belgian: see BELGIAN COLONIAL EMPIRE.

Congregational Christian Churches. Membership of the Congregational Christian Churches in the United States increased by 31,473 in 1955 and Sunday school enrolment by 29,703. The gross increase in church membership was 111,895, the largest annual increase the denomination had ever enjoyed. Of the new members admitted during 1955, 55,330 never before had made public con-

fession of the Christian faith. This was the largest number of admissions "by confession" for any year during the more than three centuries of Congregational history in the country.

The first Congregational church in America was founded by the Pilgrims in 1620. By 1956 the denomination had 1,342,045 members in 5,561 Congregational Christian Churches. The Sunday school enrolment was 773,235.

During 1955, 56,565 persons entered Congregational Christian Churches from other Christian churches and 30,876 left the former for the latter. At the beginning of 1956 there were 136,973 persons who had moved from the neighbourhood of the churches where they were members without becoming affiliated with any church in the neighbourhood to which they had gone.

Giving to benevolences in 1955 increased \$1,998,939 over 1954 to \$11,524,376; and the expenditures by local churches on their own programs went up \$3,388,504, totalling \$46,413,042. The denomination spent \$25,189,946 on new church buildings, an increase of \$4,846,902. The value of church property rose \$36,879,656 to \$474,767,940.

There were 63 new Congregational Christian church buildings completed and dedicated in the United States during 1955. The number of churches with memberships of 250 to 499 rose from 930 to 948; 469 churches had memberships of from 500 to 999 and 201 churches were recorded with memberships of more than 1,000—5 more than the previous year. Thirty-eight churches, with memberships of less than 50, were closed during the year. The year 1955 was the first in more than a generation in which the total number of churches exceeded that of the previous year.

At the beginning of 1956 there were only 321 congregations without regular ministers. The pulpits were therefore better supplied than in any previous year in the entire history of the denomination.

On June 23, 1956, in Omaha, Neb., the general council of the Congregational Christian Churches voted to unite with the Evangelical and Reformed Church in 1957, to form the United Church of Christ. The membership of the two denominations as of Jan. 1, 1956, was more than 2,100,000. This union, if consummated, would be according to a Basis of Union with Interpretations as drawn up by the two denominations and approved by them in 1947-49. These documents outlined a procedure for consummating the union and beginning the work of the new United Church of Christ. (See also CHURCH MEMBERSHIP.)

(Fd. S. B.)

Congress, U.S.: see UNITED STATES CONGRESS.

Congress of Industrial Organizations: see LABOUR UNIONS.

Connecticut. This next-to-the-smallest of the New England states, and also one of the original 13 states, is bounded on the north by Massachusetts, on the east by Rhode Island, on the south by Long Island sound and on the west by New York. It is variously known as the "Nutmeg state," the "Land of Steady Habits" or the "Constitution state." Its area is 5,009 sq.mi., of which 110 sq.mi. are water. The estimated population (July 1, 1956) was 2,232,000, as compared with 2,007,280 according to the 1950 census. Largest cities and population (1950) were: Hartford (the capital), 177,397; New Haven, 164,443; Bridgeport, 158,709; Waterbury, 104,477; Stamford, 74,293; and New Britain, 73,726.

History.—There was no regular session during 1956 of the general assembly, which sits only in odd-numbered years, and the governor did not call a special session. The outstanding feature of the year was the quick return to full employment and production by those plants devastated by the August and October floods of 1955. A survey made by the state labour department showed that, of 326 damaged plants in the seven stricken areas,

only seven had failed to reopen by July 1956.

The results of the series of flood relief tax measures enacted at the Nov. 1955 special session of the general assembly had not been fully reported by the tax commissioner, but for the first six months they produced approximately \$10,450,000. Most of these temporary taxes ran for 9 months from Jan. 1. The sales tax had been increased from 3% to 3½%, the cigarette tax was raised one cent per pack, surtaxes of 12½% on existing rates were levied for amusements, and taxes on industrial and commercial corporations and other business corporations continued. It seemed quite likely that for the full 9 months these taxes would produce the \$15,500,000 which the legislature estimated was needed. The additional two cents per gallon motor fuel tax was not included in this figure but was kept in a special fund for repairs to highways, which were severely damaged.

The construction of four large new bridges was under way in the state, two in the Hartford area and two in New Haven. The Greater Hartford Bridge authority let a contract for a bridge across the Connecticut river between Windsor and South Windsor, and also a second one across the same river to be known as the Founders bridge, connecting Hartford, at the foot of State street, with East Hartford. In New Haven, the state highway department had under construction, as part of the Connecticut turnpike, a bridge over the Quinnipiac river which was said to be the largest girder bridge in the U.S. and probably in the world. The highway department was also building a second girder bridge, only slightly smaller than the other, over the New York, New Haven and Hartford Railroad tracks, as part of a connecting spur of the Connecticut turnpike into downtown New Haven.

On Friday evening, July 27, about 300 convicts at the Wethersfield State prison staged a sit-down strike over a number of grievances. The warden resigned, and the governor put Adjutant General Frederick G. Reincke in charge until a new warden could be appointed. There was no bloodshed, but a firm stand by the governor averted what could have developed into a serious situation.

Elections.—In the few town and city elections prior to the November election, some changes took place; but on balance neither political party could claim a victory, nor was there any indication of the astonishing Republican landslide which was to come. In the November election, Pres. Dwight D. Eisenhower received 711,837 votes to Gov. Adlai Stevenson's 405,079, a plurality of 306,758, the largest given any presidential candidate in Connecticut history. It more than doubled the plurality of 129,363 given him in 1952. In the important senatorial race Sen. Prescott Bush (Rep.), received 608,255 votes as compared with the 477,769 received by his Democratic opponent, Rep. Thomas J. Dodd. The plurality of 130,486 greatly exceeded that of 1952. All five Republican congressmen were re-elected and Dodd's Democratic seat was won by Republican Edwin H. May. Far-reaching changes were made in the composition of the new state legislature. The Republicans won 31 of the 36 senatorial districts, as against the existing Democratic control of 20 seats to 16 Republican. In the lower house of 279 members there would be 245 Republicans and 34 Democrats as against the existing 187 Republicans and 92 Democrats. As a result of the election, therefore, there would be a total of only 39 Democrats in both houses and 276 Republicans. Of the large cities only Hartford remained in the Democratic column, and this at a greatly reduced majority.

Education.—For the school year 1955-56 there were 22 colleges and professional schools with 32,536 students; 4 teachers' colleges with 5,422 students; 4 junior colleges with 1,347 students; 23 state vocational technical and state-aided schools with 473 teachers and 16,669 students. There were 99 high schools with 3,452 teachers and 76,924 pupils; 41 junior high schools with 1,172 teachers and 32,046 pupils; 740 public elementary schools with 9,612 teachers and 291,252 pupils. In addition

here were 208 parochial, ecclesiastical and private schools with 2,806 teachers and 73,899 pupils.

Social Insurance and Assistance, Public Welfare and Related Programs.—During the month of June 1956, \$1,484,477 was paid to 16,403 persons for old-age assistance; \$734,219 to 5,365 dependent children; 337 blind persons received \$33,382; and \$252,473 was paid to 2,133 disabled persons. The state maintains one veterans hospital with 1,120 patients, three hospitals for the mentally ill with 10,309 patients in 1956, two institutions for mental defectives with 3,372 patients, 4 tuberculosis sanatoria with 851 patients. There are also two U.S. veterans hospitals in the state.

Communications.—For the year ending June 30, 1956, there were registered 1,025,697 motor vehicles of all classes. Motor vehicle fees amounted to \$13,416,930, and the gasoline tax receipts were \$39,025,251. Telephone outlets numbered 1,024,484. There were 25 standard broadcasting stations, FM stations and 5 television stations. There were 26 daily newspapers published in the state, 6 Sunday papers and 65 weeklies. There were 3,062 mi. in the state highway system, of which 185 were of divided lane.

Banking and Finance.—The state treasurer reported that the state's financial condition as of June 30, 1956, was as follows: cash balance, June 30, 1955, \$26,811,719.14; receipts, \$1,278,319,756.63; disbursements, \$1,280,521,044.88; cash balance, June 30, 1956, \$24,949,370.89. Bonded indebtedness was \$121,447,000. Contingent liability for payment of Greenwich-Hillings expressway revenue bonds, \$200,000,000. The bank commissioner reported that as of June 30, 1956, 51 state banks and trust companies had assets of \$1,184,710,566; 45 trust departments of state banks and trust companies had assets of \$991,227,894; 71 savings banks had assets of \$2,149,203,534; and 30 building or savings and loan associations had assets of \$142,321,845.

Agriculture.—The U.S. department of agriculture reported that for 1955 the total cash receipts from farm marketing were \$171,477,000. Receipts from eggs, broilers and chickens were \$57,901,000; from dairy products, \$44,376,000; from cattle and calves, \$4,964,000. Receipts from principal field crops were: tobacco, \$24,633,000; potatoes, \$3,771,000; apples, \$3,330,000; greenhouse and nursery products, \$17,536,000.

Table I.—Principal Crops of Connecticut

Crop	Indicated 1956	1955	Average, 1945-54
Corn, bu.	2,064,000	1,638,000	1,912,000
Wheat, bu.	66,000	64,000	100,000
Oats, all, tons	381,000	394,000	432,000
Soybeans, lb.	23,392,000	31,270,000	36,772,000
Apples, bu.	1,070,000	1,530,000	1,191,000
Peaches, bu.	145,000	155,000	140,000
Pears, bu.	50,000	60,000	47,000
Potatoes, cwt.	1,435,000	1,122,000	1,386,000

Source: U.S. Department of Agriculture.

Manufacturing.—The state labour department reported that in July the total nonagricultural employment totalled 895,690, slightly less than in June, but more than 32,000 over the previous year. Those engaged in manufacturing numbered 426,660 and those in nonmanufacturing, 469,030. In the manufacturing category, the largest group (305,800) were engaged in the metals industry and its products. In the nonmanufacturing category, the largest group (151,050) were engaged in trade. The average weekly wage of factory production workers was \$81.18, and of construction workers, \$97.05. (J. Br.)

Table II.—Principal Industries of Connecticut

Industry	All employees 1954	Salaries and wages 1954	Value added by manu- facture 1954	Value added by manu- facture 1953
			(in thousands)	
Textile mill products	26,538	92,776	138,059	186,063
Apparel and related products	17,430	46,795	75,895	75,063
Printing and publishing	13,711	60,219	92,164	82,511
Chemicals and allied products	9,946	44,612	126,931	107,873
Other products	13,052	53,443	94,409	88,624
Primary metal industries	27,780	124,596	219,094	274,378
Fabricated metal products	42,683	174,344	276,886	372,300
Machinery (except electrical)	72,088	323,277	551,930	629,858
Electrical machinery	31,713	125,369	223,464	266,787
Transportation equipment	65,732	306,635	450,174	458,709
Instruments and related products	17,832	70,357	123,896	117,031
Other miscellaneous manufactures	41,794	162,210	268,410	324,352

Source: U.S. Department of Commerce, 1954 Census of Manufactures, preliminary report

Mineral Production.—The tonnage and value of those minerals produced in Connecticut in 1953 and 1954 valued at \$100,000 or more are shown in Table III. Among the states Connecticut was second in domestic mica sold and fourth in feldspar output in 1954. Connecticut ranked 45th in value of its mineral output, with 0.07% of the U.S. total.

Table III.—Mineral Production of Connecticut

Mineral	1953		1954*	
	Quantity (in short tons)	Value	Quantity	Value
Total	438,000	\$7,917,000	289,000	\$9,686,000
Quartz	11,000	448,000	10,000	285,000
Feldspar	3,026,000	63,000	4,846,000	60,000
Sand and gravel	2,827,000	2,348,000	2,829,000	4,315,000
Other minerals	—	4,235,000	—	4,269,000
		823,000		757,000

*Preliminary.
Source: U.S. Bureau of Mines.

Conservation, Soil: see SOIL CONSERVATION.

Construction Industry: see BUILDING AND CONSTRUCTION INDUSTRY.

Consumer Co-operatives: see CO-OPERATIVES.

Consumer Credit. During 1956 consumer credit in the United States continued to rise, although in an amount substantially less than the increase in 1955. Instalment credit extensions dropped somewhat, but repayments continued their steady movement upward.

Amount Outstanding.—Total consumer credit in the U.S. reached a new record peak of \$40,196,000,000 on Oct. 31, 1956, more than \$3,600,000,000 over the total amount outstanding a year before. The increase in the calendar year 1955 had been \$6,350,000,000.

Total instalment credit, which is by far the largest component of consumer credit, reached a new peak of \$30,810,000,000 by Oct. 31, 1956, up \$2,840,000,000 during the preceding 12-month period. This compared with an increase of \$5,450,000,000 in the calendar year 1955. Total noninstalment credit, including single-payment loans, charge accounts and service credit, aggregated \$9,385,000,000 at the end of Oct. 1956, an increase of \$780,000,000 during the previous year, again less than the \$900,000,000 increase in the calendar year 1955.

At the end of Oct. 1956, of the total amount of instalment credit outstanding, \$14,480,000,000 or 47% was automobile paper, \$7,600,000,000 was other consumer goods paper, \$1,780,000,000 was repair and modernization loans and \$6,950,000,000 was personal loans. Sales finance companies held the largest portion of automobile paper, \$7,330,000,000, followed by commercial banks, with holdings of \$5,760,000,000.

Extensions and Repayments.—Instalment credit extensions, at seasonally adjusted annual rates, declined from a record \$40,400,000,000 in the third quarter of 1955 to \$39,300,000,000 in the third quarter of 1956, as a result of a sharp drop in consumer instalment credit extended for purchase of automobiles. Meanwhile, instalment credit repayments continued to climb from an annual rate, seasonally adjusted, of \$34,400,000,000 in the third quarter of 1955, to \$37,600,000,000 in the third quarter of 1956. Thus the annual rate of change in outstanding instalment credit, or the excess of extensions over repayments, dropped from \$6,000,000,000 in the third quarter of 1955 to only \$1,700,000,000 in the corresponding period in 1956. In large part this decline was caused by the sharp drop in the annual rate of change in outstanding instalment credit on automobile paper from \$4,260,000,000 to \$350,000,000.

The annual rate of instalment credit repayments in the third quarter of 1956 had reached a new high, both in absolute amount and in relation to income. The ratio of such repayments to total disposable personal income stood at 13.0%, as compared with 12.1% in the fourth quarter of 1954, before the tremendous 1955 automobile year, financed by record expansion of instalment credit.

Stand-by Authority.—In his economic report of Jan. 1956, the president made the suggestion that a study of the need for stand-by authority to regulate instalment credit terms would be timely. Somewhat later, the board of governors of the federal reserve system outlined a major study of consumer credit which it was undertaking at the request of the Council of Economic Advisers. The inquiry was to analyze the part played by instalment credit in the fluctuations in major consumer industries and the general economy and appraise the desirability and effects of control over instalment credit terms. Considerable discussion ensued, with almost all consumer credit executives being definitely against granting the federal reserve system stand-by authority to control consumer credit in peacetime. A substantial

body of opinion in the central banking field, however, held to the view that the successive easing of terms during 1955 had raised questions as to the soundness of credit based on such terms. Losses and delinquencies remained relatively low, nevertheless, with good business conditions and record levels of personal income.

Instalment Debtors.—The 1956 survey of consumer finances conducted by the board of governors of the federal reserve system in co-operation with the survey research centre of the University of Michigan, Ann Arbor, did not show any marked changes in the distribution of indebtedness among spending units, largely families, from early 1955 to early 1956. About 63% of all spending units reported some debt other than charge accounts early in 1956, with 9% owing mortgage alone, 17% owing mortgage and personal debt and 37% owing personal debt alone.

Debt was reported by more than 80% of all married couples under 45 with children. About one-third of all indebted spending units had more liquid assets than debt. Two-thirds of the spending units with instalment debt in early 1956 had scheduled repayments equal to less than 20% of their disposable income. Most of the remaining third were committed to make repayments amounting to between 20% and 40% of their income after taxes.

(See also FEDERAL RESERVE SYSTEM.)

(J. K. L.)

Canada.—Official consumer credit data are presented in a revised series which excludes the charge accounts and instalment credit of dealers who extend credit mainly to farmers or other businesses rather than to consumers. The figure of \$2,098,000,000 previously given for total consumer credit outstanding as of June 30, 1955, was thereby reduced to \$1,933,000,000. Revised midyear figures of previous years were: 1954, \$1,725,000,000; 1953, \$1,564,000,000; 1952, \$1,076,000,000.

By midyear 1956, total consumer credit had risen to \$2,302,000,000 which was a gain of 18½% from the previous year and more than double the figure of 1952.

Personal cash loans extended by banks and small loan companies of \$892,000,000 were 20% greater than at midyear 1955. Instalment credit rose 23% to \$1,072,000,000; the components of this figure were the outstandings of finance and loan companies which amounted to \$704,000,000 (up 26%) and the instalment credit on the books of retailers, \$368,000,000 (up 17%). The receivables of retail dealers on consumers charge accounts amounted to \$338,000,000, a gain of 7%.

The year 1956 was characterized by a demand for credit that exceeded the supply of funds. Although the capital investment programs for 1956, exceeding by 28% the record capital outlays of 1955, were the major cause of the rising credit demand, the governor of the Bank of Canada stressed that "consumer credit has been climbing at a rate that makes it a major cause of concern." Monetary policy was aimed at making money tighter and discouraging further undue credit expansion. Following upon the rise of the Central Bank's rediscount rate from 1½% to 2¼% between Aug. and Oct. 1955, this rate was subsequently raised in successive steps to the record rate of 3½% in Oct. 1956. As an innovation, the Bank of Canada finally introduced a flexible discount rate policy whereby the rate would always be ¼ of 1% above the average rate at which the weekly issue of treasury bills is discounted. As a result, the discount rate was 3.59% in early Nov. 1956.

(R. Rr.)

Contract Bridge.

France won the world team championship, defeating the U.S. team in a match played in Paris in Jan. 1956. The winning team was composed of Pierre Jais, Roger Trézel, Bertrand Romanet, Robert Lattès, Pierre Ghestem and René Bacherich. The U.S. team included Myron Field, Lee Hazen, Richard F. Kahn and Samuel M. Stayman of New York city, Charles J. Solomon of Philadelphia, Pa.,

and Charles H. Goren of Miami Beach, Fla.

In the annual European championships, played at Stockholm Swed., in July, Italy won the right to represent Europe in the next world championship match. The standing in "victory point" (2 for a match won, 1 for a match drawn) was: Italy, 25; France, 25 (but fewer total points than Italy); Austria, 23; Great Britain, 22; Switzerland, 17; Iceland, 16; Sweden, 15; the Netherlands, 15; Belgium, 14; Denmark, 13; Germany, 13; Egypt, 1; Norway, 10; Finland, 9; Lebanon, 8; Ireland, 1. France won the women's team championship, with Belgium second, Sweden third and Norway fourth.

Members of the winning Italian team were W. Avarelli and Belladonna of Rome and E. Chiaradia, M. D'Alelio, P. Forgi and G. Siniscalco of Naples. The match between them and the U.S. team was scheduled to be played in New York in Jan. 1957. The U.S. representatives, winners of the American Contract Bridge league's masters' team championship, were Harold Ogburn, Boris Koitychou, Peter Leventritt and Mrs. Helen Sobel of New York city and Goren and William Seamon of Miami Beach, Fla.

Winners of the principal U.S. championships, other than the masters' team championship, were:

Life masters' individual: John R. Crawford, Philadelphia.

Masters' pairs: Alvin Roth, Washington, D.C., and Tobin Stone, New York city.

Open team-of-four championship (Harold S. Vanderbilt cup): Howard Schenken, B. Jay Becker and George Rapée, New York city; John R. Crawford and Sidney Silodor, Philadelphia.

Match point team-of-four championship: Becker, Rapée, Crawford and Silodor.

Open pairs: Paul Hodge, Abilene, Tex., and Ben Fain, Houston, Tex.

As in 1955, an estimated 200 new books on bridge were published. The number of U.S. daily newspapers publishing bridge features rose more than 20%, from about 900 to nearly 1,100.

During the year there were renewed but unsuccessful efforts to have Negroes admitted to membership in the American Contract Bridge league, which had 60,000 members, all also members of semiautonomous state and local associations. Traditionally barred from this league, Negro bridge players generally belonged to the American Bridge association, which had about 2,500 members, nearly all Negroes.

(A. H. Md.)

Co-operatives.

In 1956, an estimated 81,000,000 families throughout the world voluntarily worked together through co-operatives to provide themselves with necessities, goods and services. They owned these self-help businesses democratically in most cases, through the one-member, one-vote principle of share ownership and control. In some cases, as in Great Britain and Israel, these businesses were the largest enterprises in the nation. They ranged from fishermen's co-operatives in the south seas, Japan and Nova Scotia, to large rural electric co-operatives with many thousands of members in the U.S., with more than 1,000,000 members in the London Co-operative society.

In 1956 the International Co-operative alliance, the bulk of whose member societies are in western Europe and Scandinavia, decided to extend a helping hand to the newer co-operatives in underdeveloped countries and voted to hold an Asian co-operative conference in 1957. The alliance also became more active in its program of technical aid to Asian co-operatives launched after World War II by Asiatic governments and by United Nations technical agencies.

CARE (the Cooperative for American Remittances to Everywhere) and the Co-operative League of the U.S.A. started a broad program late in 1956 to raise funds for specific gifts of loans to co-operatives in underdeveloped areas. This supplement

ARE's gift program of tools, books and other technical aids to individual recipients.

Credit.—Provision of means for saving and for low-cost credit for producers and consumers continued in 1956 to be one of the primary functions of co-operatives around the world.

In a partnership program with co-operatives, the government of India in 1956 launched its second five-year plan to provide state governments with national funds to purchase securities of co-operative credit societies. This would enable these societies to extend their aid to small farmers and other villagers. The partnership program also provided government training in management and other techniques for co-operative employees.

In North America, credit unions' membership rose to nearly 6,000,000 in 1956 with continued demand of consumers for low-cost credit and repositories for their savings. Credit unions did about 14% of the consumer loan business in the U.S.

The Rural Electrification administration in the U.S. lent \$190,000,000 to rural electric co-operatives in 1955-56, mainly for increased capacity for their distribution facilities. This brought the total of REA loans, mainly to co-operatives, to considerably more than \$3,000,000,000.

The REA also approved loans for the erection of three small co-operative power plants to be served by nuclear reactors. Approval for two of these plants, which would be the world's first co-operative atomic power plants, was granted by the Atomic Energy commission.

Marketing.—The National Grape Co-operative association in 1956 purchased the Welch Grape Juice Co., the world's largest grape processor. This purchase was made possible by an agreement between the association and Welch in 1952 for net proceeds of the company to be used for growers' purchase of Welch stock. U.S. farm marketing co-operatives collected, packed, shipped and processed at least 25% of the nation's food and fibre crops in 1956 and plans were laid for a nationwide dairy marketing co-operative.

In many parts of the world, as in Japan, Denmark and France, co-operatives marketed a much higher percentage of major crops than in the United States. Expansion of marketing facilities of co-operatives was one of the aims of the International Co-operative alliance's program for Asia and Latin America.

Farm Purchasing.—As part of their program of securing sources of raw materials for plant foods, U.S. farmer co-operatives in 1956 planned to mine phosphate rock in their holdings in Idaho and other western states. They also expanded production of nitrogen for fertilizer in Kansas and elsewhere, and added facilities of fertilizer processing and mixing plants in a number of states. These co-operatives handle a large percentage of fertilizer sold in the U.S., and process from 10% to 40% of their total distribution in 110 co-operative-owned plants.

Farmer co-operatives produced or distributed nearly one-quarter of U.S. feed, the 10th largest business in the nation. Their refineries, 2,000 oil wells and other facilities served them with petroleum products from their own sources. From 20% to 50% of the petroleum distributed in some rural areas was handled by co-operatives, which also served members with seed, machinery, hardware and other goods. Many also did grain, poultry and deer marketing and supplied their members with items needed for farming.

In most other parts of the world, farm supply purchasing was mainly at the distributive level in 1956, although increased industrialization in a number of Asiatic countries pointed the way toward co-operative production and processing of farm supplies on a broader basis.

Insurance.—Nationwide Mutual Insurance Co., largest group co-operatively oriented companies in the U.S., set up Nationwide corporation in 1956 to enable its policyholders and other

investors to purchase stock in other companies. Already the fourth largest auto insurance firm in the U.S. in its previous 13-state area, Nationwide became licensed to do business in half the states in 1956.

Insurance on a co-operative or mutual basis grew rapidly in 1956 along with the expansion of credit co-operatives in many parts of the world. In the U.S., co-operative-type firms served more than 12,000,000 families, including 1,700 farmers' mutuals, oldest form of co-operative in the nation.

Health.—The rapid growth of consumer-sponsored co-operative or group health plans in the U.S. and Canada continued in 1956. More of these plans started or proposed service facilities where their members could obtain health services from teams of doctors through prepayment of dues to the plan.

Consumer Goods.—Consumer co-operative organizations in western European countries, plus some in the United States, jointly formed a finance institution through which they hoped to obtain financing for expansion of their programs of distributing consumer goods.

Participating in the plan, headed by the general manager of the Swedish Co-operative Wholesale, were co-operatives in Great Britain, the Scandinavian countries, Belgium, the Netherlands, Switzerland and France. These co-operatives already were leading merchandisers in their respective countries, but felt the need for additional capital to compete on a sound basis with rapidly expanding commercial enterprises.

In Italy, a bank for financing bona fide co-operatives was set up in 1956 with the help of U.S. co-operatives and individuals.

Housing.—Two large unions and one credit union organization in New York city planned to use members' health and welfare funds to invest in better housing on a co-operative basis for members and other middle-income families. The Federal Housing administration appointed an assistant commissioner to supervise its program of mortgage insurance and technical aid to housing co-operatives.

(See also FARM CREDIT SYSTEM.)

(P. DE.)

Copper. In 1955, world production of copper was the largest ever, with the United States in the lead. Table I gives the world output in detail. The U.S. is not only the largest producer, but is also the largest consumer of copper in the world.

United States.—Despite long stoppages by labour strikes in mid-1955, the mine output of copper for the year was about 20% higher than in 1954. New three-year labour agreements were made in June 1956. In early Jan. 1956 Magma Copper company's San Manuel mine in Arizona produced blister copper one year ahead of schedule.

Research in the copper industry was emphasized by the U.S. bureau of mines and reserves were being evaluated in 1956. New sources of ore were sought. In Aug. 1956 the bureau reported that copper ores from Alaskan deposits, when treated by various standard ore-dressing methods, yielded commercial grade concentrates.

On May 10, 1956, the office of defense mobilization authorized

Table I.—World Mine Production of Copper

	(Thousands of short tons)							
	1948	1949	1950	1951	1952	1953	1954	1955
Belgian Congo . .	171.4	155.9	193.9	211.6	226.8	236.1	243.4	259.2
Canada	245.3	263.5	264.2	270.0	258.0	253.3	302.7	326.6
Chile	490.5	409.1	400.1	419.6	450.4	400.3	400.9	477.9
Cyprus	17.3	26.4	25.7	25.1	29.6	23.9	30.1	26.2
Japan	28.4	36.2	43.5	47.1	59.0	64.9	73.1	78.4
Mexico	65.1	63.1	68.0	74.2	64.4	66.3	60.4	60.3
Peru	19.9	30.8	33.1	35.6	33.6	39.0	42.1	52.3
No. Rhodesia . .	249.7	285.6	327.9	352.0	363.2	410.8	438.7	395.3
South Africa . . .	32.5	33.6	37.5	37.2	38.7	39.8	46.6	49.2
U.S.S.R.	198?	220?	240?	280?	325?	334?	352?	385?
United States . .	834.8	752.8	909.3	928.3	925.4	926.4	835.5	998.6
Yugoslavia . . .	40.6	37.9	44.2	35.3	36.2	34.4	33.4	31.2
Total	2,546	2,480	2,800	2,900	3,020	3,050	3,100	3,400

Table II.—Data of Copper Industry in the U.S.

	(Thousands of short tons)					
	1950	1951	1952	1953	1954*	1955†
Mine output . . .	909.3	928.3	925.3	926.4	835.5	998.6
Smelter output . . .	911.4	930.8	927.4	943.4	945.9	1,106.5
Refinery output . . .	1,239.8	1,207.0	1,177.7	1,293.1	1,209.0	1,342.5
Domestic ore . . .	920.7	951.6	923.2	932.2	841.7	997.5
Foreign ore . . .	319.1	255.4	254.5	360.9	370.2	345.0
Secondary recovery	977.2	932.3	903.2	958.5	839.8	989.0
From old scrap . .	485.2	458.1	414.6	429.4	401.0	514.6
From new scrap . .	492.0	474.2	488.6	525.1	432.8	474.4
Imports	690.4	489.1	618.9	677.1	676.1	593.6
Refined	317.4	239.0	347.0	274.8	274.1	201.6
Exports	192.3	166.3	212.4	171.3	216.0	199.8
Available for use‡ .	1,850.1	1,737.8	1,726.9	1,826.0	1,670.9	1,858.9

*Revised. †Preliminary. ‡Available for use includes total refinery output, secondary from old scrap and refined imports less exports; secondary from new scrap is only a turnover of metal in process and does not add to the supply available for use and other imports have been covered in refined output from foreign ores.

Table III.—Mine Production of Copper in the U.S.

	(Thousands of short tons)					
	1950	1951	1952	1953	1954*	1955†
Arizona . . .	403.3	415.9	395.7	393.5	377.9	454.1
California . .	0.1	0.1	0.8	0.3	0.4	0.6
Colorado . . .	3.1	3.2	3.6	2.9	4.5	4.3
Idaho	2.1	2.2	3.2	3.1	4.3	5.6
Michigan . . .	25.6	25.0	21.7	24.1	23.6	50.1
Missouri . . .	3.0	2.4	2.6	2.4	1.9	1.7
Montana . . .	54.5	57.4	61.9	77.6	59.3	81.5
Nevada	52.6	56.5	57.5	61.9	70.2	78.9
New Mexico . .	66.3	73.6	76.1	72.5	60.6	66.4
Utah	278.6	271.1	282.9	269.5	211.8	232.9
Washington . .	5.1	4.1	4.4	3.7	3.6	—
Others	15.0	17.1	14.9	14.9	17.4	16.5
Total	909.3	928.3	925.4	926.4	835.5	992.6

*Revised. †Preliminary.

the General Services administration to negotiate with contractors for orderly delivery of about 40,000 tons of copper which had been deferred in 1954-55 to alleviate industrial shortages. In the first six months of 1956 the mine copper tonnage (653,470) and smelter tonnage (733,222) already exceeded those for the first eight months of 1956.

Chile.—Both Chuquicamata and Braden interests were expanding their copper operations considerably. The former, which had been processing copper ores by leaching, was in the sulphide zones and was beneficiating sulphide ores as well as oxide ores by flotation. The mine, entirely open pit until 1952, was in 1956 mining underground in addition to the open pits. Financed by the Export-Import bank, Cerro de Pasco Corp. was working on an exploration operation of copper at Rio Blanco.

Northern Rhodesia.—Chibulma mine, scheduled to produce about 18,000 tons of copper a year, was opened May 5, 1956.

Peru.—Development of copper at Toquepala advanced actively in 1955 and 1956. No output was expected before 1959 or 1960.

United Kingdom.—On July 2, 1956, the British board of

trade reported that it would sell 36,000 tons of copper from its stockpile between Aug. 15, 1956, and March 31, 1957.

(See also FOREIGN INVESTMENTS.) (F. E. H.; B. B. M.)

ENCYCLOPÆDIA BRITANNICA FILMS.—Copper—Mining and Smelting (1950).

Corn. The 1956 U.S. corn crop was king-size, indicated 3,412,183,000 bu. valued at fully \$5,000,000,000; it was exceeded only by the 1948 crop of 3,605,078,000 bu.

Partly because of farm programs, farmers planted only an estimated 79,016,000 ac. to corn. Drought damage and soil

Table I.—U.S. Corn Crops

	1956*	1955	Average 1945-54
Total production (thousands of bu.)	3,412,183	3,241,536	3,084,333
Acreage harvested (thousands)	77,596	79,900	83,222
Yields (bu. per acre)	44.0	40.6	37.1

*Indicated figures.

Table II.—U.S. Corn Production by Leading States

		(in 000 bu.)					(in 000 bu.)		
State	Indicated 1956	1955	Average 1945-54	State	Indicated 1956	1955	Average 1945-54	State	Indicated 1956
Illinois	595,563	523,992	467,584	Alabama . . .	53,856	68,010	48,000	Virginia . . .	38,208
Iowa	511,632	522,200	539,996	Mississippi . .	37,125	48,420	38,900	Kansas	33,432
Minnesota . . .	321,537	284,935	238,754	North Dakota .	31,824	31,410	24,600	New York . . .	33,408
Indiana	286,980	276,136	234,926	Maryland . . .	28,620	21,020	20,900	North Dakota .	31,824
Ohio	216,530	220,955	185,752	Texas	28,365	48,288	44,200	South Carolina	20,685
Missouri	195,097	165,204	141,798	South Carolina	20,685	29,344	24,500	Arkansas . . .	16,900
Wisconsin . . .	166,020	137,000	126,847	Colorado . . .	16,852	16,650	13,300	Louisiana . . .	15,325
Nebraska	114,830	107,424	220,863	California . . .	14,472	16,170	3,200	Florida	12,180
South Dakota . .	105,952	87,318	106,860	Tennessee . . .	58,377	61,285	58,149		
Michigan	101,184	93,186	68,524						
Kentucky	83,520	79,252	76,049						
North Carolina .	80,729	70,482	62,535						
Pennsylvania . .	70,013	61,364	61,501						
Georgia	65,064	67,080	46,942						
Tennessee . . .	58,377	61,285	58,149						

diversion to the soil bank reduced the harvested acreage to an indicated 77,596,000 ac., the lowest acreage for harvest since 1892. Under the acreage reserve phase of the soil bank, 320,400 ac. agreements were signed with corn producers covering 5,450,100 ac. on which a maximum of \$180,629,284 could be earned.

In spite of severe drought damage in portions of the western corn belt, a new record high yield of 44.0 bu. per harvested acre was indicated, breaking the previous 1948 record of 42.5 bu. per acre. Illinois had a fabulous average of 67 bu. per acre and for the second consecutive year exceeded the usual leading producer, Iowa.

WEED-FREE CORNFIELD in central Illinois, a demonstration plot showing the effect of a herbicide developed by the Monsanto Chemical company, was tested extensively in 1956. The manufacturers claimed that use of the chemical would eliminate all but a single cultivation of corn and soybean fields.



The average price to producers in October was \$1.19 per bushel, as compared with \$1.14 per bushel a year earlier. The official support price in the 840 counties of the commercial corn belt, first announced as \$1.40 per bushel (81% of parity) for those abiding by acreage allotments, was later revised to \$1.50 per bushel or 86.2% of parity for those planting within the corn base acreage or allocated acreage. For those in the commercial area not observing such restrictions a support at \$1.25 per bushel was offered. This was noted as the first time that a secretary of agriculture had granted a price support for farmers not complying with acreage restrictions in a "commercial" area.

A record carry-over of about 1,166,000,000 bu., plus the new crop, gave a record total supply for 1956-57 in excess of 4,575,000,000 bu. Consumption, because of smaller supplies of competing feed grains, was expected to exceed the 3,100,000,000 bu. used in 1955-56, in spite of a reduced number of hogs to be fattened. Nevertheless, it was anticipated that carry-over in Oct. 1957 would show an increase over 1956, most of it to be held by the Commodity Credit corporation. Farmers put 420,000,000 bu. of the 1955 crop under price support, as compared with only 257,000,000 bu. of the 1955 crop. A total of about 110,000,000 bu. were exported from the U.S. in 1955-56.

The world corn crop of 1956-57 was preliminarily indicated at a record high of 6,540,000,000 bu. as compared with 6,280,-

presidents in Panamá after visiting Puerto Rico, where he told a joint session of the legislature that Costa Rica could learn much from Puerto Rico's rapid economic development. Further travel plans were interrupted when his projected three-month trip to Mexico, France and Italy was temporarily blocked by the Costa Rican congress.

In anticipation of the May 1958 presidential election, the tempo of Costa Rican politics quickened. A government effort to minimize the influence of financial pressures on political parties through a plan requiring the government to bear all campaign expenses was opposed by former Controller General Armadio Quiroz, who said that since the turn of the century the "spoils system" had ruled Costa Rican presidential politics. Quiroz stated that inevitably the winners would pass a law recognizing only their own expenses and denying any reimbursement to the losers.

Coffee and fruit production, primarily in the Turrialba and Alajuela regions, was threatened by an invasion of the Mediterranean fruit fly. Officials were cautiously optimistic about efforts made to control the pest.

The Costa Rican fuel outlook was greatly brightened by an oil discovery in September. The Union Oil Company of California announced that it had completed a well in Limón province at a depth of 4,950 ft. which was flowing 1,000 bbl. per day. The strike was made on Union's 3,500,000-ac. Costa Rican concession adjoining its 350,000-ac. Panamá concession. U.S. concerns, exploring an adjacent region in Panamá, declared that their holdings may be part of the same oil basin.

(See also ORGANIZATION OF AMERICAN STATES; PANAMÁ.)

(R. HN.)

Education.—In 1954 there were 1,293 primary schools with 5,471 teachers and 137,941 pupils and 39 secondary and normal schools with 12,708 students. University education was available at the University of Costa Rica. The 5 daily newspapers had a circulation of 78,000 in 1952. According to the 1950 census, 21.2% of those 10 yr. of age and over were illiterate.

Finance.—The monetary unit is the colon, valued in 1956 at 17.64 cents U.S. currency, official rate, and at 15.04 cents, controlled free rate. The national budget for 1956 balanced revenue and expenditure initially at 259,822,300 colones. Actual revenue in 1955 was 261,750,030 colones; expenditure, 253,414,113 colones. The public debt on April 30, 1956, was 349,994,000 colones, of which 127,771,000 colones represented the external debt. Currency in circulation in May 1956 totalled 139,300,000 colones; demand deposits, 194,400,000 colones. The cost-of-living index (San José) stood at 107 in May 1956 (1953=100).

Trade and Communications.—Exports in 1955 amounted to \$78,927,000 (subject to final adjustment for revaluation of banana exports). Imports were \$87,508,000. Chief exports were coffee (47%), bananas (39%), cacao (7%) and abacá (1%). Leading customers were the U.S. (54%), western Germany (27%) and Canada (5%); leading suppliers, the U.S. (60%), Western Germany (9%) and the U.K. (7%).

Railway lines (1954) included 416 mi. of public railway and 388 mi. of private railway. In 1951 there were 930 mi. of all-weather roads and 3,725 mi. of dirt roads. Motor vehicle registration (Jan. 1, 1955) included 8,450 automobiles, 4,880 trucks and 947 buses. According to *Lloyd's Register of Shipping*, the merchant marine had 114 vessels (100 tons and over) aggregating 340,710 gross tons on June 30, 1955. Telephones (Jan. 1, 1955) numbered 10,901, none of which were automatic and 80% of which were located in San José.

Agriculture.—Exports in 1955 included coffee 430,528 bags of 132 lb. each, bananas 9,085,795 stems, cacao 9,696 metric tons, abacá 937 tons. Production in the 1954-55 season included coffee 564,000 bags, centrifugal sugar 28,000 tons, panela 33,000 short tons, cacao 24,969,000 lb. In 1954 there were 762,000 cattle, (1950) 112,156 hogs and 77,335 horses.

Manufactures.—In 1950 there were 1,267 manufacturing establishments with annual production valued at \$78,251,000. Most important were food and kindred products (26.8%), printing and publishing (23.4%) and apparel and related products (22.2%). Installed electric energy capacity in 1954 totalled 57,100 kw., largely hydroelectric; production (public use only) was 221,000,000 kw.hr. (J. W. Mw.)

ENCYCLOPÆDIA BRITANNICA FILMS.—Costa Rica (1955); Central America (1944).

Cost of Living: see BUSINESS REVIEW; PRICES.

Cotton. **United States Cotton Production.**—The U.S. in 1956 harvested a large cotton crop of 13,303,000 bales from the smallest cotton acreage since the 1880s. The crop was 11% smaller than the 14,721,000-bale crop of 1955, but slightly larger than the 13,098,000-bale average for 1945-54. The official

Table III.—Corn Production of the Principal Producing Countries

(in 000 bu.)

Country	Indicated 1956	1955	Average, 1945-49	Average, 1935-39
United States	3,412,183	3,241,536	3,056,687	2,315,554
Brazil . . . . .	...	255,000	224,400	215,153
Mexico	170,000	141,720	95,389	67,523
Argentina . . . . .	...	152,350	155,012	301,986
U.S.S.R.	120,000	125,720	90,980	113,000
China . . . . .	...	...	113,000	170,000
Manchuria . . . . .	...	...	274,013	262,000
Union of South Africa . . . . .	...	129,230	130,000	86,585
India . . . . .	...	100,760	86,699	80,132
			79,836	67,240

1,000,000 bu. in 1955 and a pre-World War II average of 4,775,000,000 bu. The acreage increased to 262,650,000 ac. as compared with 250,410,000 ac. in 1955-56 and only 222,570,000 ac. average 1935-39. (J. K. R.)

ENCYCLOPÆDIA BRITANNICA FILMS.—Corn Farmer (1939); The Middle States (1955).

Corporation Income Tax: see TAXATION.

Cosmic Rays: see NATIONAL GEOGRAPHIC SOCIETY.

Costa Rica. A Central American republic, Costa Rica is located between Nicaragua and Panamá. Area: 59,695 sq.mi.; pop. (1950 census), 800,875; (1955 est.), 970,000, classified as about 80% white, 16% mixed, 3% Negro and less than 1% Indian. The capital is San José (1950 census) 86,909; other principal cities are Alajuela, 13,903; Cartago, 12,944; Guadalupe, 8,452; Heredia, 11,967; Limón, 11,310; and Puntarenas, 13,272. Language: Spanish. Religion: predominantly Roman Catholic. President in 1956: José Figueres.

History.—In Jan. 1956, Costa Rican Ambassador Fernandoournier and Nicaraguan Ambassador Guillermo Sevilla Sacasa signed two pacts designed to forestall future hostilities between the two countries. The pacts provided for the establishment of a joint frontier surveillance committee composed of military officers and of a committee composed of foreign representatives with free access to all parts of both countries. The only incident which threatened to disturb this new era of peace was the arrest of Honduran Abraham Perry Baker, who attempted to enter Costa Rica from Nicaragua. Baker confessed that he intended to assassinate Pres. José Figueres, Vice-Pres. Blanco Cervantes, Archbishop Odio and other high-ranking officials.

In July, President Figueres attended the meeting of American

acreage allotment was 17,400,000, about 4% less than the 1955 allotment of 18,200,000 ac. Only an estimated 16,962,000 ac. of cotton were under cultivation on July 1, 3% less than the 17,-

Table I.—U.S. Cotton Production by Leading States
(in 000 500-lb. bales)

State	Indicated 1956	1955	Average, 1945-54
Texas	3,600	4,039	3,518
Mississippi	1,620	2,023	1,656
Arkansas	1,445	1,663	1,382
California	1,310	1,205	1,164
Arizona	825	728	559
Alabama	750	1,045	880
Georgia	590	701	625
Louisiana	550	623	564
Tennessee	580	582	586
South Carolina	505	572	656
Missouri	430	410	362
North Carolina	360	351	457
New Mexico	285	266	237
Oklahoma	260	463	356
Other states	43	50	47

506,000 ac. of cotton in cultivation July 1, 1955, and comparable with a ten-year average of 22,746,000 ac. Preliminary information on cotton acreage placed under the 1956 Acreage Reserve program of the soil bank indicated that about 1,064,000 ac. were signed up, almost four-fifths in Texas. Payments of approximately \$26,000,000 were anticipated.

In spite of considerable weevil damage and severe drought limitations on yields of dry-land cotton in large parts of Texas and Oklahoma, the average yield per acre of lint was 403 lb.

The 1956 crop of American-Egyptian long-staple type cotton produced under irrigation in the southwest was indicated at 47,200 bales, as compared with 32,900 bales average 1945-54. The acreage for harvest was 39,800 and the indicated yield 570 lb. per acre.

Marketing quotas having been overwhelmingly voted by cotton producers, the support price for 1956 crop middling $\frac{7}{8}$ -in. staple at average location was set at 29.34 cents per pound or 82½% of parity, as compared with 31.70 cents per pound or 90% of parity for the 1955 crop. Translated into one-inch length staple, the base used after Aug. 1 for trading on the New Orleans Cotton exchange, the equivalent support rate thereon was 32.74 cents per pound. American-Egyptian type was supported at 55.73 cents per pound. Market prices fluctuated generally rather close to the support price level.

The over-all supply situation continued to be one of embarrassing abundance. The end of the season carry-over on Aug. 1 was a new record high of about 14,100,000 bales, exceeding the previous record of about 13,000,000 bales set in 1939. Of the carry-over, about 9,900,000 bales were held by the Commodity Credit corporation, as compared with 8,133,000 bales in 1955 and as little as 79,000 bales in 1951. The carry-over plus the new crop equalled a record total supply of about 27,300,000 bales. However, there appeared some prospect that if domestic mill consumption in 1956-57 should approach the 9,200,000 bales of 1955-56 and exports should approach the hoped for 5,000,000 bale level, then the build-up in stocks would halt.

Exports were pushed more vigorously, first, early in the year by the sale of short-staple supplies at cut-rate prices, then, for shipment after Aug. 1, to the world market on a competitive basis, with bids acceptable at a level "comparable" to 25.5 cents per pound; cash equalization payments to exporters were announced at 6.58 cents per pound.

World Cotton Production and Trade.—The world cotton crop of 1956-57 was indicated at 38,930,000 bales as compared with 39,520,000 bales in the previous year and a pre-World War II average crop of 31,689,000 bales. The decrease was entirely in the free world, especially in the United States and Mexico; the Communist countries showed an increase to 9,415,000 bales from 8,702,000 bales in 1955 and 6,322,000 bales average prewar.

India in 1955-56, with exports of 504,000 bales, half of

which went to Japan, against imports of 427,000 bales, became a net exporter for the first time since partition. Pakistan reversed a trend of increasing consumption and declining export by shipping 716,000 bales, an increase of 13% over the previous year.

Mexico's cotton production in 1956-57 was estimated at 1,800,000 bales, as compared with 2,250,000 bales in the previous year. About 1,375,000 bales were indicated as available for export against record exports of 2,027,000 bales in 1955-56. Both Mexico and Brazil protested the cotton export program of the United States, the former instituting for a time a very controversial barter plan requiring payment in cotton for some imports.

Japan absorbed 873,000 bales of the 2,320,000 bales exported by the U.S. in 1955-56 and was expected to take more than 1,000,000 bales in 1956-57, partly under credit facilities made available by the Export-Import bank.

Table II.—Cotton Production of the Principal Producing Countries
(in 000 500-lb. bales)

Country	1956*	1955	Average, 1945-49	Average, 1935-39
United States	13,153	14,721	12,104	13,149
India	4,200	3,800	2,304	5,348†
China (including Manchuria) . . . . .	...	...	1,939	2,855
U.S.S.R. . . . .	...	...	2,328	3,430
Mexico	1,800	2,250	577	334
Brazil . . . . .	...	1,700	1,352	1,956
Egypt	1,523	1,535	1,456	1,893
Pakistan	1,400	1,420	1,024	...
Turkey	625	600	268	249
Argentina	550	525	427	289
Peru	500	500	308	379
Sudan . . . . .	...	441	246	248
Uganda . . . . .	...	300	227	281

*Indicated. †Includes Pakistan.

Linters.—An indicated production in 1956 of about 1,600,000 bales of this cotton cellulose by-product, plus a carry-over of 1,000,000 bales, and imports into U.S. of 200,000 bales provided the smallest supply since 1952-53, 2,800,000 bales against 3,400,000 bales in 1955-56. If disappearance in 1956-57 should continue as anticipated at the record rate of 2,200,000 bales achieved in 1955-56, year end stocks would be reduced to about 800,000 bales, lowest since 1952. Prices generally declined in 1955-56, most grades setting new postwar lows.

Cottonseed.—Indicated production in 1956 of this major oilseed crop, which results from ginning seed cotton, was 5,495,000 tons, as compared with 6,038,000 tons in 1955. The 1956 crop was supported at \$48.60 per ton, as compared with \$46.34 per ton in 1955.

(See also TEXTILE INDUSTRY.)

(J. K. R.)

ENCYCLOPÆDIA BRITANNICA FILMS.—Cotton (1946).

Cottonseed Oil: see VEGETABLE OILS AND ANIMAL FATS.

Council of Europe: see EUROPEAN UNITY.

Counterfeiting: see SECRET SERVICE, U.S.

Countries of the World, Areas and Populations of the: see AREAS AND POPULATIONS OF THE COUNTRIES OF THE WORLD.

Cournand, André Frédéric (1895-), French-U.S. physiologist, was co-winner of the 1956 Nobel prize in medicine with Dickinson W. Richards and Werner Forssmann (*qq.v.*) for pioneer research in the detection and treatment of heart disease. The official award citation of the Nobel prize committee stated that their research had made possible the diagnosis of cardiac disease "earlier and with greater certainty than before," thus increasing "the prospects of preventing further deterioration." Cournand, Richards and Forssmann shared the Nobel prize committee's cash prize of \$38,684.

Cournand, born at Paris, Fr., on Sept. 24, served in the French armed forces during World War I, receiving the *croix de guerre* with three stars. Emigrating to the United States, he

became a staff member of Bellevue hospital, New York city, in 1930 and later was appointed a chief resident. In 1935 he joined the faculty of the Columbia university college of physicians and surgeons, becoming full professor of medicine in 1951. During World War II he was an investigator with the U.S. Office of Scientific Research and Development. He was also named sectional chairman of the National Heart institute in Washington, D.C. Courmand became a U.S. citizen in 1941.

Describing the prize-winning research of Courmand and Richards, the Nobel prize committee's citation of Oct. 18, 1956, said that the awards had been made for "discoveries concerning heart catheterization and pathological changes in the circulatory system."

Courts: see LAW.

Cranberries: see FRUIT.

Credit, Consumer: see CONSUMER CREDIT.

Credit Unions: see CO-OPERATIVES; FARM CREDIT SYSTEM.

Crime. **United States.**—Crime-reporting procedures in the U.S. distinguish between part I and part II offenses. Categories of crimes that are most likely to be known to the police are included in the first group. Since most part II crimes become known only when arrests are made, crime statistics for these offenses on a national basis are not available.

While the population of the country had increased only 9% since 1950, part I crimes were 26% more prevalent in 1955 than in the former year. The 1955 crime rate was 15.9% greater than the 1950 rate.

While 1955 was the first year in eight not to register an increase in part I crimes, the decrease from 1954 was slight (only 2%) and the first half of 1956 experienced a 14.4% increase over comparable 1955 crimes. The increases and decreases in the several classes of part I crimes during both these periods were shown in Table I.

Table I.—Per Cent Change in Estimated Number of Part I Crimes Known to Police in 1955 Compared With Number in 1954, and in First Six Months of 1956 Compared With First Half of 1955

Part I crimes	Per cent change	
	1954-55	First half 1955-56
Murder and nonnegligent manslaughter.	0.0	4.0
Manslaughter by negligence	3.7	10.2
Robbery	5.9	6.8
Aggravated assault.	-14.7	-1.1
Burglary (breaking and entering)	-0.9	2.8
Larceny (theft)	-5.1	4.7
Auto theft.	1.5	18.5
Total.	5.2	22.3
	-0.2	14.4

Comparison of 1955 statistics with those of 1954 reveals that crimes against persons as a group increased while crimes against property as a group decreased in number. While both larceny and auto theft were commoner in 1955 than in 1954, their increased numbers were compensated for by greater decreases in robberies and burglaries.

It is interesting to note that, while crime rates increase with population concentration, the 1955 decreases in crime frequency were in urban areas and the greatest decrease was experienced in the group of large cities. While urban crime decreased 0.8%, rural crime increased 1.8%; while urban murders increased 1.7%, murders increased 3.1% in rural areas; while urban robberies decreased 15.3%, robberies decreased only 12% in rural areas.

This trend, favourable for the urban communities, did not continue during the first half of 1956. Comparison of the first six months of 1956 with the same period in 1955 shows that both urban and rural crime increased in approximately the same proportion: 14% for urban crime and 14.6% for rural crime. The

great increases in urban crime were found in the categories of rape (13.3%), larceny (18.1%) and auto theft (27.1%).

Crime statistics for 1955 continued to show that on the whole cities with greater populations have higher crime rates than the smaller communities. Comparisons of 1955 figures with those for 1954, however, show that an over-all decrease in crime was experienced only by the large cities as a group—those in excess of 250,000 population. Comparison of the first six-month period of 1955 with that of 1956 indicates that the crime rates of these large cities, as a group, increased in all categories except robbery, in which the crime rate was unchanged. On the whole, however, the crime rates of the smaller cities increased at an even greater pace.

Analysis of the 1955 increases and decreases from the 1954 frequency of types of crimes reveals changes. For example, a comparison of the frequency of robberies classified according to property attacked shows a consistent decrease in all categories (highway, commercial house, gasoline station, chain store, residence, bank and miscellaneous) except bank. The number of bank robberies increased from 122 to 142 during this time. Only 1.3% of robberies in 1955 were committed in dwellings, a 24.7% decrease from 1954. While the frequency of rape increased 8.7%, statutory rape decreased 4.6%. In the larceny class of crime, pocket picking, purse snatching and thefts from autos (except accessories) decreased by the following percentages, respectively: 15.2, 13.5 and 9; all other categories of larcenies increased in 1955. Of all residence burglaries in that year, 54.6% were committed at night.

The 1955 average loss per property crime, excluding auto thefts, was \$108 as compared with \$111 in 1954. The average robbery loss, however, increased from \$219 in 1954 to \$246 in 1955. Of all larcenies (excluding auto thefts), 72.6% involved thefts of less than \$50. This was approximately the same proportion as in 1954.

The per capita loss in property crimes including auto thefts in 427 cities amounted to \$3.82 in 1955, based on 1950 census figures. Recoveries of 56.8% (compared with 55.6% in 1954) held the unrecovered per capita loss to \$1.63.

Comparison of arrest data for 1954 and 1955 from 1,162 cities having a total 1950 population of 36,000,000 showed an increase of only 0.4%. Cities having more than 25,000 inhabitants reported a decrease of 0.7% while smaller communities experienced a 5.1% increase. There were no significant shifts in the distribution of arrests among the crime classifications. Drunkenness



POLICE CORDON searching a Long Island, N.Y., field for clues in the gangland killing of a hoodlum believed to be involved in the acid attack which blinded Victor Riesel (q.v.) in April 1956

continued to account for a substantial proportion of all arrests; 43.1% of all male arrests and 29% of all female arrests were for this offense.

The increasing frequency of juvenile crime was reflected in the greater proportion of persons arrested who were less than 18 years of age. This group accounted for 10.5% of all arrests in 1955 as compared with 9.7% in 1954. Of those younger than 18 years, 40% were under 15, which was approximately the same proportion as in 1954. Persons under 18 years of age accounted for 42.3% of the arrests for part I crimes; of these, 47.9% were under the age of 15.

The increase in the proportion of persons arrested for certain offenses who were under 18 years of age is apparent from the figures in Table II.

Table II.—Per Cent of Persons Arrested Under 18 Years of Age

Offense	Per cent under 18 1954	1955	Offense	Per cent under 18 1954	1955
Robbery	18.7	21.4	Rape	15.3	18.1
Aggravated assault	6.6	7.5	Narcotic drug law violations	2.4	3.6
Other assaults	5.9	6.8	Weapons law violations	13.1	16.8
Burglary	49.0	52.7	Liquor law violations	10.7	11.4
Larceny	43.6	46.9	Disorderly conduct	9.8	10.3
Auto theft	57.6	62.2			
Stolen property law violations	26.0	27.5			

(See also FEDERAL BUREAU OF INVESTIGATION; JUVENILE DELINQUENCY; LAW; SECRET SERVICE, U.S.) (O. W. W.)

England and Wales.—The decline in the total of indictable offenses known to the police continued in 1954 but was not maintained in 1955. A fall of 38,662 was followed by a slight rise of 3,758. There was also a slight decrease in the percentage of crimes cleared up from 49.2% to 48.7%. Broken down into types of offenses, this over-all rise showed an increase in larceny, receiving, sexual offenses and violence against the person, and a decrease in breaking and entering and in frauds and false pretenses.

Still comparing 1955 with 1954, there was an increase of 1% in the number found guilty of indictable offenses compared with 1.5% in the case of nonindictable offenses. Traffic offenses (dealt with summarily) comprised 55.5% of the total number of persons found guilty of offenses of all kinds. Larceny, at 9.3%, constituted the next largest group.

More motoring offenses were recorded in 1955 than ever before, a total of 643,855, and an increase of 5.8% over the previous year.

The general trend in the years following World War II for persons of all ages found guilty of indictable offenses was a rise to a peak in 1951 and then a decline. This rise was occasioned mainly by the increase in delinquency among children under 14 years, and the fall was greatest in this age-group. The sex differential (*i.e.*, ratio of male to female crime) shows the effects of the war to have been greater in the case of women, particularly among juveniles, than of men.

	1938	1951	1955
Total number of indictable offenses known to the police	283,220	524,506	438,085
Larceny	199,951	355,407	295,035
Breaking and entering	49,184	95,946	74,907
Frauds and false pretenses	16,097	27,415	22,966
Sexual offenses	5,018	14,633	17,078
Violence against the person	2,721	6,516	7,884

One of the most noticeable features of this table is the steady increase since 1938 of sexual offenses and offenses against the person.

Renewed attention during the year was given by the police to adult gangs particularly to those carrying on warfare among their members and operating so-called protection rackets from the racecourses.

(See also POLICE; PRISONS.)

(J. C. SR.)

Crowther, Geoffrey (1907—), British economist and journalist was born at Leeds, May 13. He was educated at Leeds grammar school, at Oundle and at Clare college, Cambridge, afterward studying at Yale and Columbia universities. After a period as economic adviser to the Irish banks' standing committee in 1932 he joined the *Economist*, where henceforward his main activities and influence were concentrated, and became assistant editor in 1935. In 1938 the paper's editorship devolved upon him. He combined this office with that of a director of the Economist Newspaper Ltd. and upon resigning as editor in March 1956 retained his connection with the organization as a managing director.

In April 1956 he was appointed London chairman of the Encyclopædia Britannica, bringing to this essentially Anglo-American enterprise a firm belief in the indispensability of the transatlantic alliance. This had been the cornerstone of his editorial policy at the *Economist*, where he had been responsible for introducing a detailed section on United States affairs.

During World War II Crowther advised the ministry of supply (1940-41) and the ministry of information (1941-42), and was deputy head of the joint war production staff, ministry of production (1942-43). He also edited *Transatlantic* from 1943 to 1945, was editor of *Europa Publications* from 1940 and its director from 1945 to 1950. His contributions to academic economics were *An Introduction to the Study of Prices* (with Sir W. T. Layton, 1935) and *An Outline of Money* (1941). He also published *Ways and Means* (1936), *Economics for Democrats* (1939) and *Ways and Means of War* (1940).

Crude Oil: see PETROLEUM.

Cuba. The large island and numerous small islands lying between 20° and 25° N. lat. and 74° and 85° W. long. constitute the republic of Cuba; the aggregate area under the sovereignty of the republic is 44,217 sq.mi. The census of 1953 disclosed a total population of 5,829,029. The capital is Havana, with 785,455 inhabitants in the city. Some of the suburbs comprising Havana's metropolitan area are quite large (Marianao 226,252, and Guanabacoa 104,957). Other large cities and their populations (1953 census) are Santiago de Cuba 163,237. Camagüey 132,059. Santa Clara 85,678, Guantánamo 83,684. Holguín 81,920, Cienfuegos 70,833, Matanzas 67,558, Sancti Spiritus 58,160 and Pinar del Río 46,182. There are 12 other cities with more than 25,000 inhabitants each. The final report of the 1953 census revealed that 57% (3,324,628) of Cuba's population live in cities and towns and 43% (2,504,401) in small villages and rural areas. By race, the report classifies 72.8% as white, 12.4% as Afro-American, 14.5% as mixed and 0.3% as Asiatic. There were 149,327 foreigners domiciled in Cuba in Jan. 1953, of whom 74,561 were Spaniards, 27,543 Haitians, 14,421 British (chiefly West Indians), 11,834 Chinese and 6,503 citizens of the United States.

History.—Fulgencio Batista was president throughout 1956. Early in the year, an abortive revolutionary movement culminated in the arrest and expulsion of former President Carlos Prío Socarrás. In October another plot was uncovered which was also attributed to Prío.

The year 1956 was one of relative prosperity in Cuba. Rain-fall in the sugar areas was below normal, so that many mills reported late in the year that they would not be able to fill their quotas for 1956-57 production. The quota base was the same as for 1955, 4,600,000 long tons, the first increase since 1952. Contrary to expectations, the carry-over into 1957 was the smallest in years. Prices, accordingly, were firm. Coffee was sold abroad in volume for the first time in ten years. New nickel developments in the province of Oriente competed with

the steadily expanding Nicaro mining enterprise. Oil in volume good quality was found at considerable depth in various places; one well near Havana averaged 520 bbl. daily. The Compañía Técnica Cubana began to operate a plant, built with a government loan, to manufacture newsprint from sugar cane residue (bagasse). A large enterprise of the United States established a substantial plant for the manufacture of glass containers.

Of the \$100,000,000 in bonds issued by the Bank for Economic and Social Development (known as "Bandes") in 1955 under the plan to issue \$350,000,000 as part of a four-year plan of economic diversification, only \$2,000,000 remained unallocated by June 1956. On June 13 a further issue of \$150,000,000 was authorized, and in the ensuing three months more than \$80,000,000 were allocated, mainly to urban and rural road construction and other public works.

By the end of the year, the task of organizing and consolidating the floating debts of Cuba, many years under way, was virtually completed. The floating debt incurred prior to 1940 had been sifted thoroughly and certified at about \$25,000,000, while that originating from 1940 to 1955 was expected to stand at less than \$80,000,000. It was believed that early in 1957 the total of approximately \$100,000,000 could be properly funded, so that Cuba for the first time in a generation would be rid of the worst menace to the stability of the currency, namely, floating debt. Consolidation operations and the public works programs of "Bandes" had increased the funded debt by 47%, or \$66,000,000 from Dec. 31, 1954, to Dec. 31, 1955, when the funded debt stood at \$581,800,000; and these two same factors could be calculated to bring the total somewhere between \$850,000,000 and \$900,000,000 by the end of 1957.

The foreign relations of Cuba were reasonably unperturbed during the year, apart from some acrimonious exchanges with the Dominican Republic. The president attended the meeting of American presidents in Panamá in July. Progress was made toward the conclusion of a treaty with the United States to eliminate the double taxation of income. (C. E. Mc.)

Education.—In the school year 1952-53 public primary schools had an enrollment of 634,924 and 23,163 teachers; private schools had 98,724 pupils. There were 21 institutes for secondary education with 26,413 pupils, 10 normal schools with 1,817 students; and 45 other schools with 11,545 students. University education was available at the University of Havana (18,379 students), Oriente university (Santiago de Cuba) (556), Santa Clara university (Santa Clara) (767) and the Catholic University of Villanova (Havana) (523).

Finance.—The monetary unit is the peso, officially pegged at par with the U.S. dollar. The budget for the fiscal year 1956-57 (July 1-June 30) was placed initially at \$330,149,470 (1955-56: \$312,874,863). On June 30, 1956, the consolidated public debt amounted to \$612,244,600. Currency in circulation (March 31, 1956) was \$385,000,000; demand deposits, \$1,000,000. The U.S. department of commerce estimated U.S. direct private investments in 1955 at \$723,000,000, of which public utility investments accounted for \$305,000,000. The cost-of-living index (Havana) was 149.8 in March 1956 (1953=100). National income was estimated at \$723,000,000 in 1954.

Trade and Communications.—Exports in 1955 totalled \$594,155,434; imports, \$495,528,237 (1954: \$487,880,770). Leading exports in 1955 were sugar (74%), tobacco and products (7%), molasses (6%), nickel (4%) and copper (2%). Leading customers were the U.S. (67%), the U.S.R. (6%), Japan (4%), western Germany (3%) and the Netherlands (3%); leading suppliers, the U.S. (71%), the Netherlands Antilles (3%), western Germany (3%) and Canada (3%). Leading import groups in 1954 included foodstuffs and beverages (31%), machinery, apparatus and vehicles (19%) and stone, earth, ore, glass and clay products (12%).

Railways (1949) included 3,017 mi. of main line, 660 mi. of sidings, yards and 7,870 mi. of industrial trackage. Roads (1949) included 10 mi. of paved highways and 600 mi. of improved highways. On June 30, 1956, there were 131,250 privately owned automobiles, 45,381 buses and 4,415 buses. Telephones (Jan. 1, 1956) numbered 142,359, 77 of which were located in Havana. There were (1954) 10 television stations and (1955) 200,000 television sets.

Agriculture.—Production of sugar in the 1955-56 season, limited by government decree, was 5,225,000 short tons; that of blackstrap molasses, 21,000 gal.; high-test molasses, 115,000,000 gal. Production estimates for other crops in 1955-56 included rice (rough) 400,000,000 lb.; coffee 90,000 bags of 132 lb. each; cacao 4,360,000 lb.; oranges 1,900,000 lb. of 70 lb. each; grapefruit 200,000 boxes of 80 lb. each; tobacco (1955) 104,683,000 lb.; henequen (1955) 19,300,000 lb. In 1951-52 there were an estimated 4,033,000 cattle, 1,286,000 pigs and 194,000 sheep.

Manufactures.—Production in 1955 included cement 423,600 metric tons;

rayon filament yarn 5,160 tons; beer 117,919,422 l.; alcohol 183,223,038 l.; rubber tires 101,069; tubes 46,994. Sales of electric energy by the one large company (representing about 90% of total production) were 1,020,424,000 kw.hr.; total installed capacity (1954) was 500,000 kw.

Minerals.—Copper production totalled 19,507 short tons in 1955. Exports included nickel 15,585 metric tons; manganese ore 258,442 tons; iron ore 122,506 tons; chrome ore 47,732 tons. Crude petroleum production was 1,013,999 gal. (J. W. Mw.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Caribbean Sky Cruise* (1955); *Cuba* (1955).

Curaçao: see NETHERLANDS ANTILLES.

Curling. The Mitchell medal, one of the most desired prizes in the sport, was won in 1956 by the Utica (N.Y.) club's no. 1 rink, skipped by Roy Read. A quartet from Huntsville, Ont., led by Wally Irwin, won the Allen medal. The Country Club cup, third-place award, went to the Utica no. 2 team, skipped by Proctor Eldred, Jr. E. J. Belanger's Nashua (N.H.) four overpowered Midland, Ont., for the Dewar cup.

Play for the Gordon grand national champion rink medal took place at Schenectady, N.Y., Feb. 10-13. Top honours in the 87-year-old competition went to the Utica no. 2 team, skipped by Fred Parkinson. The Emmet consolation was won by Mahopac, N.Y., and the Mohawk consolation by the Ardsley Curling club (N.Y.). The 20th tournament for the Douglas medal was held at Mount Hope, N.Y., Jan. 13-15, and the big prize went to the Toronto Granites. St. Andrews no. 3, defeated Russell Weston's Ardsley no. 3 team in the Griffith medal consolation play.

St. George Curling club of Montreal, headed by Fred Rubbra, captured the big prize in the 70th annual international at Detroit, Mich., Jan. 5-8, 1956. The Galt (Ont.) side outscored Hamilton (Ont.) for the Detroit cup, and the Erwin Palmer trophy went to Hugh St. Clair's four from Milwaukee. Twenty U.S. teams met 20 Canadian rinks in opening-round play on a total-score basis, and the U.S. took the Ahern trophy for the first time, winning 199-165.

The eighth annual national championship of the United States Women's Curling association was held at the Chicago Curling club in Northbrook, Ill., and the Indian Hill club at Winnetka, Ill., Feb. 14-17. The three-year reign of the Wauwatosa (Wis.) Nell Granites club rink came to an end when the Chicago Heathers took top honours. The Heathers also won the Appleton and Indian Hill prizes; Wauwatosa won the Exmoor trophy; and the Indian Hill Squaws gained the Skokie award.

The first international bonspiel for teen-agers took place at Utica, Dec. 17-18, 1955, and Brockville (Ont.) no. 2 was victor. Utica no. 2 led the second group, and Morrisburg (Ont.) won the third group prize. All records for schoolboy play went overboard during the 1955 Christmas holidays at Winnipeg, Man., when 230 rinks competed in the annual province-wide bonspiel. The Kenora (Ont.) rink triumphed.

Playoffs were necessary to decide the annual playdowns for the Canadian championships at Moncton, N.B., early in March. High mark of the big bonspiel came in the crucial game for MacDonald's Brier Tankard when Billy Walsh, Manitoba skip, broke a 7-7 deadlock to conquer Ontario. Central Collegiates of Regina, Sask., won the schoolboy playoff.

Other winning teams, with skips in parentheses, included the following:

St. Paul (Minn.) international—St. Paul (A. E. Venables).
Winchester (Mass.) international—Fredericton, N.B. (Art Limerick).
Portage (Wis.) mixed—Portage club (Harold Sommers).
Brookline (Mass.) women's international—the (Brookline) Country Club (Mrs. U. H. Crocker).
Rankin trophy—Montreal West (Peter Millar).
Duluth (Minn.) international—Ft. William, Ont. (Bob Murray).
Midwest championship—Portage Curling club (K. Lauterbach).
Lake Placid (N.Y.) international—Granite Curling club, Toronto (C. R. Mills).
Lake Placid mixed bonspiel—Sudbury, Ont. (Charles Jessup).
(T. V. H.)

Currency: see COINAGE; EXCHANGE CONTROL AND EXCHANGE RATES. See also under various countries.

Cycling. The 1956 United States senior open title was won by Jack Disney of Altadena, Calif., for the third consecutive time. The women's national title went to Nancy Nieman of Detroit, Mich., and the junior open crown was carried off by Dave Staub of San Francisco, Calif. Billy Zisa of New Milford, N.J., took the New York city, New Jersey state, New England states and national juvenile championships. Ted Smith of Buffalo, N.Y., won U.S. all-around honours at Hartford, Conn., Sept. 2 when he finished $\frac{1}{10}$ sec. ahead of Art Longsjö of Fitchburg, Mass. The 13th annual 50-mi. tour of Somerville, N.J., on May 30 was won by Jackie Heid of Rockaway, N.Y. He led a field of 136 riders, scoring by only 2 ft. over Ted Smith. Al Stiller of Chicago took a 50-mi. national event at Patchin, N.Y., and Sal Barone of Brooklyn, N.Y., won a 50-mi. test at Comack, N.Y. Olympic trials in California in September produced top performances, including a new national record of 1 min. 13.5 sec. for 1,000 metres set by Allen Bell of the U.S. navy. (See also OLYMPIC GAMES.)

World Championships.—Copenhagen was the scene of several world title races. Frans Mahn (Neth.) won the amateur road championship there on Aug. 25, with Michel Rosseau of France earning amateur sprint honours four days later. Reg Harris (Great Britain) won the international professional grand prix for the third straight time on Aug. 5. Antonio Maspes of Italy, was world professional sprint ruler and Rik Van Steenbergen (Belg.) took the professional road title. On Aug. 6, a U.S. cyclist, Jeanne Robinson of Detroit, set a women's track record of 15.2 sec. for 200 metres from a flying start at Alexandria Park stadium in Portsmouth, Eng.

Tour de France.—This grind of 2,765 mi., which extended over 24 days with stops in 22 cities, was won in 1956 by Roger Walkowiak, a Frenchman of Polish descent, who led Gilbert Bauvin of France by 1 min. 25 sec. Stan Ockers of Belgium won the 5-day Grand Prix of Nations race that ended in Rome on April 29, and Bernard Gauthier of France won the annual Bordeaux-to-Paris road event of June 3. (T. V. H.)

C.Y.O.: see SOCIETIES AND ASSOCIATIONS, U.S.: *Catholic Organizations for Youth.*

Cyprus. This British island colony and strategic base in the eastern Mediterranean is about 40 mi. from the southern coast of Turkey. Area: 3,572 sq.mi. Pop. (1946 census) 450,114 (80.8% Orthodox Greeks, 17.7% Moslem Turks); (1955 est.) 520,000. Chief towns (pop., 1954 est.): Nicosia (cap.) 42,000; Limassol 27,300; Famagusta 20,900; Larnaca 16,600. Governor in 1956: Field Marshal Sir John Harding.

History.—The terrorism which began in 1955 continued throughout the early months of 1956. Negotiations between the governor, Field Marshal Sir John Harding, and Archbishop Makarios proceeded and at the end of February the British colonial secretary, A. Lennox-Boyd, flew to the island to meet the archbishop and the Turkish leaders. On his return to London the colonial secretary announced in the house of commons that the archbishop had seen the text of a statement he proposed to issue, setting out the British government's policy on Cyprus. This document stated that it was not the British government's position that the principle of self-determination should never be applicable to Cyprus. It was the government's position that it was not at that time a practical proposition on account of the situation in the east Mediterranean.

The colonial secretary went on to say that the British government was in favour of a wide measure of immediate self-

government and was ready to send a constitutional commission to the island to draft a constitution, but the archbishop was not prepared to associate himself with the statement, although he was ready to co-operate in framing a constitution when satisfied on certain points relating to the amnesty it was proposed to declare, and in regard to the Greek elected majority under the proposed constitution. Since the archbishop was not satisfied the negotiations had broken down. There followed the deportation of the archbishop and the Bishop of Kyrenia to the Seychelles, the government of Cyprus declaring that it had evidence that they were deeply implicated in the campaign of terrorism started by the organization EOKA (*Ethniki Organosi Kypriakou Agonos*, or National Organization of Cypriot Struggle). During the debate on this action in the house of commons the prime minister said that the most culpable aspect of the archbishop's conduct had been his failure to condemn terrorism publicly.

During June the governor of Cyprus went to London for further discussions about the future of Cyprus. The chief of the British imperial general staff, Gen. Sir G. Templer, then visited Ankara, presumably to ascertain the views of the Turks. On his return the prime minister stated that though the principle of self-determination had been accepted, the problem was how it could be applied so as to protect the interests not only of Greece and Britain but of Turkey. As it had proved impossible to obtain an international agreement, he said, it had been decided that for the present no progress by these means could be realized. On the other hand it was decided to send Lord Radcliffe to Cyprus immediately to make recommendations on a new liberal constitution for the island, including safeguards for the interests of all communities.

Shortly afterward, EOKA announced that to prevent further bloodshed and to help achieve a settlement, it had ordered the cessation of hostilities. The governor replied that the members of EOKA might surrender with their arms within three weeks and decide whether to be evacuated to Greece or to remain in Cyprus. In the latter event they would be detained during the emergency but would not be tried for any terrorist offense unless the government had evidence that they had committed violence against the person. This offer was rejected by EOKA, and violence began again with renewed intensity. During April 1956 Oct. 1956 165 persons lost their lives, including 51 British servicemen and the U.S. vice-consul in Nicosia.

(See GREECE; MAKARIOS III.)

(B. A. C. S.-E.)

Education.—Schools: primary (1953-54) 730, pupils 67,994; (1955 secondary 57, pupils 19,660; agricultural 2; trade 1; teacher training colleges 2, students 320.

Finance and Trade.—Monetary unit: piatra (64.3 piastras = \$1 U.S. Budget (excluding development fund, 1955 revised est.): revenue £11,431,521, expenditure £11,135,285. Foreign trade (1955): imports £30,420,000, exports £18,239,000. Main products and exports (1955, in metric tons) pyrites 970,635, asbestos 12,843, copper 2,851; also citrus, carobs, wild olives, potatoes.

Czechoslovakia. A people's republic of central Europe. Czechoslovakia is bounded west and northwest by Germany, north and northeast by Poland, east by the U.S.S.R., south by Hungary and Austria. Area: 49,354 sq.mi. (including autonomous Slovakia, 18,902 sq.mi.). Pop. (1947 census): 12,164,095 (including Slovakia 3,402,300); (1955 est. 13,089,000 (including Slovakia 3,750,000). Language (1955 est. Czech 65.4%; Slovak 27.7%; German 1.4%; Hungarian 3.1%; Ukrainian 1.4%; Polish 0.7%. Religion (1930 census): Roman Catholic (Latin rite) 73.5%; Protestant (all denominations) 7.7%; Czechoslovak Church 5.4%; Greek Catholic 4%; Greek Orthodox 1%; Jewish 2.4%; atheist 5.8%. Chief towns (pop. 1947 census): Prague (cap.) 922,284; Brno 273,127; Moravia Ostrava 180,960; Bratislava 165,134; Plzen Liberec 117,811. First secretary of the Communist party of Czechoslovakia



Above: **TERRORIST SUSPECT** is searched for weapons by detective after the murder of a British policeman (under blanket at left) in Nicosia

Below: **OLD WOMAN** being photographed for an identity card. From June 1956 every Cypriot of 12 years or older was required to carry such a card



Below: **EXILED CHURCHMEN** Bishop Kyprianos (left) of Kyrenia and Archbishop Makarios, accused of leading the *enosis* (union with Greece) movement, arriving by boat at Mahé Island of the Seychelles group where they were placed under the guard of Maj. Trevor Williams (right), chief of police. The man second from right is the bishop's secretary



Above: **BRITISH SOLDIER**, stationed on a Nicosia rooftop, controlling traffic below

Below: **BARBED WIRE** separating the Greek and Turkish sectors of Nicosia



1956, Antonin Novotny; president of the republic, Antonin Zapotocky; chairman of the council of ministers, Vilem Siroky.

History.—On Jan. 1, 1956, Czechoslovakia embarked on its second five-year plan, which called by the end of 1960 for an increase in gross industrial production of at least 50% (61.5% in Slovakia), and in agricultural production of roughly 30% (39.8% in Slovakia). Despite a planned increase in consumer goods the emphasis remained on heavy industry.

According to the Central Trades Union council, all industries except heavy engineering were still abreast of their aims at the end of September. However, throughout the year coal production remained a problem, mainly because of a shortage of manpower and high absenteeism, and by mid-October the situation was admitted to be serious.

In agriculture the collectivization drive was vigorously pursued, but with persuasion rather than threats. It was claimed in September that 56% of all villages had some form of co-operative and cultivated more than one-third of the arable land. The State Statistical office's half-yearly report had stated that 46.5% of all arable land was farmed by the "Socialist sector" (*i.e.*, producers' co-operatives and state farms). The 1956 grain and potato harvests were said to be good but throughout the year the press published complaints about food supplies and, particularly, meat shortages. In the annual price reductions on April 1 basic foodstuffs were reduced only slightly, if at all. However, supplies of food and consumer goods, although still unsatisfactory, slowly improved. A new National Insurance act published in October, increased sickness benefits and pensions. On Oct. 1 the standard working week was reduced to 46 hours.

Trade relations were greatly extended, particularly with underdeveloped countries, and Czechoslovakia exhibited at a number of middle and far eastern, as well as European, trade fairs. A trade agreement with Great Britain was signed on Oct. 22.

In the political field, the Communist party and government showed some skill in handling the situation produced by the 20th congress of the Communist party of the Soviet Union. Since the "personality cult" had never been seriously practised in Czechoslovakia, no major changes of leadership were called for; the only casualty was Alexei Cepicka, minister of defense (son-in-law of former Pres. Klement Gottwald), who subsequently reappeared as chairman of the Office for Inventions and Normalization.

The apparent freedom to criticize allowed by the new party line was fully exploited by both writers and students. At the 2nd congress of Czechoslovak writers in April several speakers were so bitterly critical of the methods of Communism that Pres. Antonin Zapotocky, himself a novelist, had to administer a sharp rebuke. In May students of Prague and Bratislava universities staged demonstrations ridiculing the Communists and drew up lists of demands for greater freedom, political as well as academic, which they succeeded in circulating widely.

In June a special Communist party conference, originally summoned to discuss the new five-year plan, gave government and party leaders an opportunity to warn the country as a whole that the new freedom to criticize was strictly limited, and excluded the party, the Soviet Union and Communism as such. One result of this conference, however, was a bill designed to give greater autonomy to the Slovak governmental organs, approved by parliament on July 30.

Czechoslovakia remained outwardly quiet throughout the Polish changes and the Hungarian revolution, and every medium of propaganda declared the country's unshakable allegiance to the Soviet Union. The number of alleged spies arrested at this time, and Zapotocky's broadcast warning on Nov. 3 that "we shall not allow anyone to threaten our Socialist system by any demagogic slogans, demands or pretexts whatsoever," nevertheless betrayed

nervousness about the state of feeling in the country.

(B. S. N.)

Education.—Schools (1953): nursery, pupils 165,000; primary 9,045, pupils 1,030,000; higher primary 2,745, pupils 473,000, secondary 304, pupils 80,300; vocational, pupils (1956) 139,000; institutions of higher education (1956) 17, students 48,000. There were also Hungarian, German, Ukrainian and Polish schools.

Finance.—Budget (koruny, 1956 est.): revenue 90,304,200,000; expenditure 89,886,900,000, including 48,092,700,000 (53.5%) invested in the national economy. Monetary unit: koruna with official exchange rate, high and fictitious, of 7.20 koruny to the U.S. dollar.

Foreign Trade.—UN Economic Commission for Europe's estimates, in U.S. dollars, 1954: trade turnover with all countries: \$1,940,000,000, including \$1,450,000,000 with the countries of the Communist group.

Transport and Communications.—Highways (1955): 43,718 mi. Licensed motor vehicles (Dec. 1955): cars 105,000, commercial 73,000. Railways (1947): 8,161 mi. Air transport (1953 est.): 1,689,000 km. flown; 20,541,000 passenger-kilometres. Telephones (1954 est.): 350,700. Radio receiving sets (Dec. 1952): 2,717,000, including 320,000 in Slovakia.

Agriculture.—Main crops (metric tons, 1934–38 average; 1948–52 in parentheses): wheat 1,513,000 (1,486,000); barley 1,109,000 (1,060,000); oats 1,212,000 (966,000); rye 1,568,000 (1,230,000); potatoes 9,635,000 (6,780,000); sugar beets 4,664,000 (4,253,000). Livestock (1938; latest estimates in parentheses): cattle 4,376,000 (1954: 3,840,000); pigs 3,538,000 (1953: 3,456,000); sheep 533,000 (1953: 1,110,000); horses 662,000 (1950: 640,000).

Industry.—Production (metric tons if not otherwise stated, 1937; 1955 in parentheses): coal 16,672,000 (22,100,000); lignite 17,895,000 (40,700,000); coke 3,280,000 (7,000,000); electricity 4,115,000,000 (15,000,000,000) kw.hr.; iron ore 1,800,000 (2,500,000); pig iron 1,675,000 (3,000,000); steel 2,301,000 (4,500,000); cement 1,273,000 (2,900,000); sulphuric acid 166,000 (384,000); motor vehicles 8,200 (14,700) lorry units (one lorry unit = three passenger cars); tractors (1955) 12,300 units; cotton fabrics (1955) 340,300,000 m.; sugar 604,000 (658,800).

Dahomey: see FRENCH UNION; FRENCH WEST AFRICA.

Dairy Products. Total U.S. milk production in 1956 was in excess of 127,000,000,000 lb., about 3% above the 1955 record of 123,500,000,000 lb. It was produced by 20,998,000 milk cows, the fewest in the last quarter century. Average production per cow in 1956 exceeded 6,000 lb. for the first time.

For the first eight months of 1956 the price of whole milk to producers averaged \$4.00 per hundredweight as compared with \$3.87 for the same months of 1955. Because of larger production cash receipts were about 10% higher than in 1955, but higher production costs reduced the net increase. Milk sold directly by farmers to consumers increased slightly to 21.1 cents per quart in September, as compared with 20.9 cents a year earlier. Government support prices on manufacturing milk were increased to \$3.25 per hundredweight for the year April 1, 1956, to March 31, 1957, as compared with \$3.15 per hundredweight during the preceding year. Buying prices for manufactured products were raised accordingly.

Preliminary indications were that butter production in 1956 would utilize slightly more than 31,000,000,000 lb. of milk, turn out 1,590,000,000 lb. of butter and supply at least 9 lb. for consumption per person. Production of creamery butter during the first 7 months of 1956 was 911,000,000 lb. as compared with 899,000,000 lb. during the same months of 1955. The butter buying price of the Commodity Credit corporation (C.C.C.) was increased by 2 cents to 58.6 cents per pound after March 31, about 81% of parity. Government purchases during the first part of the marketing year approximated those for the same period of 1955, yet butter stocks held by the C.C.C. on Aug. 31 were only 61,822,000 lb. as compared with 268,776,000 lb. a year earlier. For the year ended April 1, 1956, margarine sales were slightly below the preceding year, whereas consumers used 4% more butter than in 1954–55. During the calendar year per capita consumption was indicated as 9.0 lb. of butter and 8.0 lb. of margarine.

Cheese production January through July 1956 was 887,000,000 lb. of all types of cheese as compared with 869,000,000 lb. for the same months of 1955. Consumption was indicated at 7.8 lb. per person. Holdings of the C.C.C. were reduced to 278,635,000

lb. as of Aug. 31, as compared with 365,957,000 lb. a year earlier. The much discussed dairy import quotas for 1955-56 included cheese limits by types as follows: cheddar, 2,777,500 lb.; edam and gouda, 4,599,492 lb.; blue mould, 4,164,007 lb.; Italian types, 9,199,201 lb.

Production of evaporated milk declined moderately, but ice cream increased to 392,000,000 gal. for the first 7 months of 1956, as compared with 371,000,000 gal. for the same period of 1955.

Milk Production in Principal Producing Countries
(In millions of pounds)

Country	Preliminary 1956	1955	1954	Average, 1946-50
United States	127,000	123,554	122,294	117,297
France	39,400	40,406	40,903	27,256
Western Germany	38,100	37,273	37,595	24,993
United Kingdom	25,800	23,834	24,196	20,394
Italy	18,000	17,949	16,949	15,000
Canada	17,600	17,277	16,902	16,844
Australia	15,105	14,017	13,174	12,206
Netherlands	13,000	12,832	12,967	10,109
New Zealand	11,780	11,220	10,905	9,487
Denmark	11,300	11,321	11,892	10,181
Argentina	11,200	11,183	10,589	7,762

Source: U.S. Department of Agriculture.

The post-World War II upward trend in world milk production continued in 1956, with increases especially in North America and Oceania. Production in 22 primary producing countries in 1956 was estimated at 381,000,000,000 lb., 2% more than in 1955. Utilization as fluid milk increased to 37.6% of the total in 1955, 2% more than in the previous year. Diversion of milk to butter manufacture dropped to 34.9% of the total, from 35.9% in 1954. World utilization for cheese manufacture declined slightly to 11.8% of the total, and production of evaporated, condensed and powdered milk increased, as did feeding to live-stock. Apparently butter production, which had declined in 1955, increased in 1956 as did production of cheese and dried milk.

(J. K. R.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Milk* (1955).

Dakar: see FRENCH WEST AFRICA.

Dams. Construction of dams for the optimum development of water resources proceeded at an increasing pace during 1956. Table I lists 15 of the important dams of the world under construction or completed during 1956. World-wide attention was focused on the controversy over financing the 360-ft. Aswan

high dam on the Nile river in Egypt. The withdrawal in July of offers of financial assistance by the United States and Great Britain was purported to be one of the contributing factors in Egypt's nationalization of the Suez canal, which, in turn, contributed to the precipitation of fighting in the middle east. The dam as planned would be located approximately 4 mi. upstream from the existing Aswan dam, and would be the world's largest rock-fill dam.

In Northern Rhodesia, at Kariba dam the 30-ft. by 40-ft. diversion tunnel was completed in 1956. The 420-ft. high, 1,800-ft. long concrete arch dam would harness the great Zambesi river at Kariba gorge 250 mi. below Victoria falls and would create the world's largest man-made lake.

In the United States, on the Columbia river, construction was undertaken in 1956 on the 175-ft. high Priest Rapids dam, one of the projects under the federal government policy which favoured development of water resources in partnership with local agencies. Downstream, at the Dalles dam, the most critical phase of construction was passed in Oct. 1956, with closure of the dam ahead of schedule despite a 10-day shutdown during the winter caused by severe cold weather and the necessity of flooding cofferdams during the heavy spring runoff. On the Snake river, tributary to the Columbia, the 395-ft. high Brownlee dam of the Idaho Power company's three-dam Hell's Canyon project was under way in 1956, despite continued efforts of the proponents of government ownership of power facilities to have the Federal Power commission licence withdrawn in favour of the proposed government-owned single high dam project.

On the Missouri river, at Oahe, the world's largest rolled earth-fill dam, slides occurred in the left abutment area involving approximately 5,000,000 cu.yd. of material in an area approximately $\frac{1}{4}$ -mi. long by $\frac{1}{2}$ -mi. wide. In order to speed the work of lining the downstream half of the outlet tunnels, the unusual feat was undertaken of moving the concrete batch plant bodily 2 mi. from the upstream to the downstream location.

On the St. Lawrence river, between the United States and Canada, at the St. Lawrence International Hydro-electric Development, first-stage construction was completed at the Long Sault and Iroquois dams in Oct. 1956, permitting the closure of the main river channel and the diversion of the full flow of the river through the completed portions of the dams.

In Brazil, on the Rio Grande, the 220-ft. high, 1,725-ft. long,

Table I.—Chief Dams Completed or Under Construction During 1956

Name of dam	River	Place	Type	Maximum height (feet)	Crest length (feet)	Volume (cu. yd.)	Purpose*	Built by	Progress†
Bersimis	Bersimis	Quebec, Can.	Rock fill	200	2,200	3,800,000	P	Quebec Hydro-electric commission	U
Buford	Colorado	Georgia, U.S.	Earth fill	200	1,630	4,145,000	F, N, P	U.S. army engineers	C
Dalles	Columbia	Washington-Oregon, U.S.	Concrete gravity-rock fill	285	—	2,250,000 conc. rock	N, P	U.S. army engineers	U
Gavins Point	Missouri	South Dakota, U.S.	Earth fill	74	8,700	18,000,000	F, N, P	U.S. army engineers	U
Glen Canyon	Colorado	Arizona, U.S.	Concrete gravity	700	—	4,770,000	I, P	U.S. bureau of reclamation	U
Grand Dixence	Dixence	Switzerland	Concrete gravity	584	1,600	2,352,000	P	Grand Dixence, S.A.	U
Guarico	Guarico	Venezuela	Earth fill	100	47,500	15,000,000	I	Ministry of public works	C
Mauvoisin	Dranse	Switzerland	Concrete arch	780†	1,760	2,800,000	P	—	U
Oahe	Missouri	South Dakota, U.S.	Earth fill	230	9,300	78,000,000	F, I, N, P	U.S. army engineers	U
Palisades	Snake, S. Fork	Idaho, U.S.	Earth fill	258	2,200	13,800,000	I, P	U.S. bureau of reclamation	U
San Antonio	San Antonio Cr.	California, U.S.	Earth fill	160	3,850	6,050,000	F	U.S. army engineers	C
Sariyar	Sakarya	Turkey	Concrete gravity	360	820	730,000	P	Eribank	C
Serre Poncon	Durance	France	Earth fill	402	—	18,000,000	P	Electricité de France	U
Whittier Narrows	San Gabriel-Rio Hondo	California, U.S.	Earth fill	55	16,960	3,200,000	F	U.S. army engineers	C
Wishon	Kings, N. Fork	California, U.S.	Rock fill	250	3,350	3,680,000	P	Pacific Gas and Electric Corp.	U

*F=Flood Control; I=Irrigation; N=Navigation; P=Power.

†C=Completed in 1956; U=Under Construction.

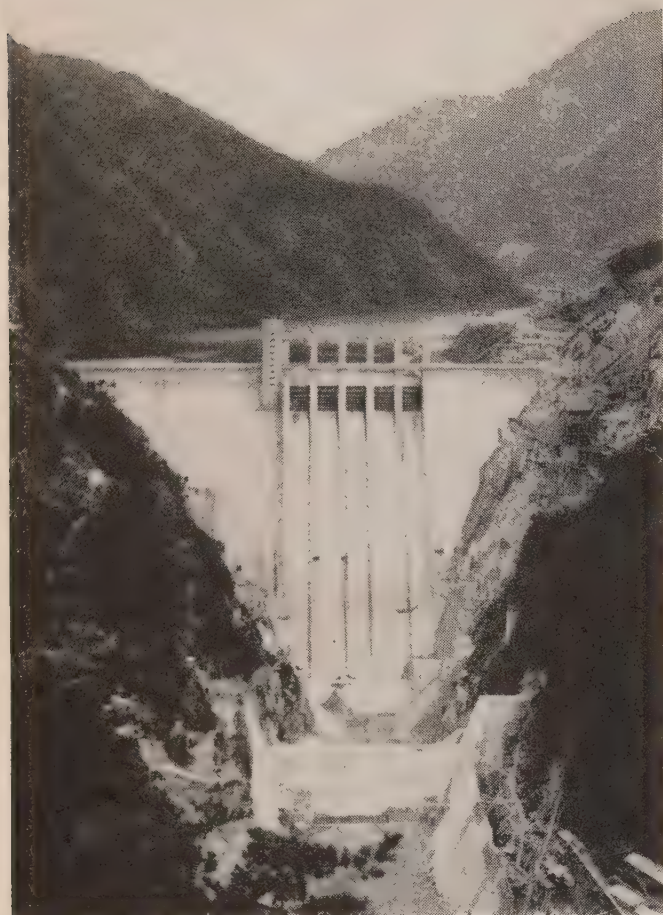
‡Highest in the world.

Table II.—World's Largest Dams

Type of dam	Name of dam	River	Location	Height (feet)	Length (feet)	Volume (cu. yd.)	Purpose†	Completed (year)
Concrete straight gravity	Grand Coulee	Columbia	Washington, U.S.	550	4,173	10,585,000	F, I, P	1942
Concrete arch-gravity	Hoover*	Colorado	Arizona-Nevada, U.S.	726	1,244	4,400,000	F, I, P	1936
Concrete arch	Tignes*	Isère	France	592	1,400	900,000	P	1953
Earth fill	Fort Peck	Missouri	Montana, U.S.	250	10,578	109,000,000	F, N, P	1940
Earth fill	Anderson Ranch*	Boise, S. Fork	Idaho, U.S.	456	1,350	9,600,000	F, I, P	1948
Rock fill	San Gabriel No. 1*	San Gabriel	California, U.S.	381	1,520	10,809,000	F	1937
Concrete multiple arch	Pensacola	Grand	Oklahoma, U.S.	152	5,625	500,000	F, P	1940
Concrete multiple arch	Bartlett*	Verde	Arizona, U.S.	287	1,063	182,000	I	1939
Concrete buttress	San Giacomo di Fraele	Adda	Italy	275	1,365	650,000	—	1950
Concrete buttress	Ancipa*	Troina	Italy	305	750	380,000	—	1952

*Highest of its type.

†F=Flood Control; I=Irrigation; N=Navigation; P=Power.



SAKUMA DAM on the Tenryu river, Japan, under construction in 1956. The completed structure would furnish 350,000 kw. of electric power and would be the tallest dam in Japan, and seventh tallest in the world

Peixoto concrete dam was well under way in 1956. The dam is a unique combination of straight gravity spillway and powerhouse intake structures adjacent to the right and left abutments, respectively, and an arch dam across the deep central portion of the channel between thrust blocks at the river ends of the two gravity sections. The Tres Marias dam, 230-ft. high, 8,600-ft. long, on the São Francisco river, was also under construction.

In Switzerland, construction progressed on the Grand Dixence and Mauvoisin concrete dams, on the Dixence and Dranse rivers, respectively. Grand Dixence, a gravity dam, to be completed initially to a height of 584 ft., was planned ultimately to extend to a height of 922 ft. The Mauvoisin dam, an arch dam, would be 780-ft. high.

In Australia, on the Eucumbene river in New South Wales, the Adamina dam was under construction in 1956, a 390-ft. high, 1,500-ft. long earth and rock fill.

In India, at the Bhakra dam on the Sutlej river, the 215-ft. high upstream cofferdam was completed during the summer of 1956 and pouring of concrete on the 680-ft. high gravity dam was started in Nov. 1956. At the Damodar Valley project, Maithon dam, a 162-ft. high, 12,500-ft. long earth-fill dam on the Barakar river, was practically complete in 1956. Also the 133-ft. high, 16,870-ft. long, Panchet Hill earth-fill dam was under construction in 1956.

In Japan, on the Tenryu river, Sakuma dam, a 504-ft. high, 965-ft. long concrete gravity dam, was practically complete in 1956.

(See also IRRIGATION.)

(B. O. M.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Water Power* (1937).

Dance. **Ballet.**—During 1956 there was a phenomenal increase in international exchange of dance companies. Under the sponsorship of the United States state department, which allocated more than \$1,000,000 to dance groups under its cultural exchange program, U.S. companies toured Europe, South America, the near east and Asia.

The New York City Ballet appeared at the Salzburg festival, made its Vienna debut, danced in Italy, Germany and Belgium and planned performances in France and Scandinavia. Ballet Theatre, which completed a South American tour late in 1955, revisited London and made its first appearance in Yugoslavia, Greece and Turkey. Martha Graham and her modern dance company toured Japan, Korea, the Philippines, Indonesia, Burma, Pakistan, India and Iran. Tom Two Arrows presented songs and dances of the American Indian during an extensive tour of south Asia.

The Royal Danish Ballet, custodian of a unique choreographic tradition dating back nearly 200 years, made a triumphant American debut. Two groups from Yugoslavia revealed that country's rich folk dance heritage. Dance Theatre Berlin, Antonio and his Spanish ballet, the Azuma Kabuki dancers from Japan, Lycette Darsonval's Paris Ballet and Marcel Marceau were among other visitors to the United States from abroad.

The Bolshoi Theatre Ballet of Moscow danced for a month in London, appearing outside Russia for the first time in its two centuries of existence. Curiosity and anticipation were so great that ticket seekers formed a queue three days before the opening of the box office. The supreme artistry of Galina Ulanova, the prima ballerina, made a profound impression.

Folk dance companies from the U.S.S.R. and Hungary played in London, while the Stanislavsky Ballet, of Moscow, appeared in Paris, indicating the increasing willingness of the "iron curtain" countries to exhibit their dance arts in the west.

Unfortunately, few new works of permanent value were produced by U.S. dance companies. Constant touring made the creation of large-scale ballets difficult or impossible; New York seasons were brief and sometimes poorly supported. An enormous potential audience was revealed when a telecast of Sadler's Wells Ballet in *The Sleeping Beauty* attracted an estimated 30,000,000 viewers. Enthusiasm ran high for the Royal Danish Ballet, which drew capacity audiences.

An auspicious sign was the trend toward the establishment of regional ballet companies. The first Southern Ballet festival, held in Atlanta, Ga., presented companies from Birmingham, Charlotte, Jacksonville, Tampa and Miami. The San Francisco Ballet made its east coast debut and was selected for a tour of the orient under state department auspices.

United States.—The New York City Ballet, directed by Lincoln Kirstein and George Balanchine, produced *Souvenirs* and *The Still Point*, choreographed by Todd Bolender to scores by Samuel Barber and Claude Debussy; *The Concert*, a satirical work by Jerome Robbins, music by Frédéric Chopin; and Balanchine's *Pas de dix*, music from Alexander Glazunov's *Raymonda*. *Jeux d'enfants* was an unsatisfactory attempt to encourage choreographic talent within the company. During a Mozart festival in Stratford, Conn., Balanchine staged *A Musical Joke* and a revised version of *Caracole*.

Maria Tallchief, prima ballerina, withdrew in the autumn because of illness. Principal dancers were Tanaquil LeClerq, Diana Adams, Patricia Wilde, Melissa Hayden, Yvonne Mounsey, Jilana, André Eglevsky, Nicholas Magallanes, Herbert Bliss, Roy Tobias, Jacques d'Amboise, Bolender and Francisco Moncion.

The American classic style developed by Balanchine in the New York City Ballet was hailed in Europe as an important contribution to ballet.

Ballet Theatre, during its New York season, produced *Rib of*

Eve, choreographed by Agnes de Mille, music by Morton Gould. Antony Tudor's *Offenbach in the Underworld* and Robert Joffrey's *Pas de Déesses* were added to the repertory. Tudor's *Undertow* and *Dim Lustre* were revived. Erik Bruhn resigned from the Royal Danish Ballet to become Ballet Theatre's *premier danseur*. Leading artists included Nora Kaye, Rosella Hightower, Lupe Serrano, Ruth Ann Koesun, John Kriza, Hugh Laing and Scott Douglas. More stimulating than the ambitious, expensive *Rib of Eve*, produced by the parent company, were experimental ballets by Harry Asmus, Katherine Litz, Job Sanders and Joffrey, seen at a Ballet Theatre Workshop performance.

Ballet Russe de Monte Carlo toured the United States and danced at the Lewisohn stadium, New York city. Its only new ballet was *Sombreros*, choreographed by Leon Danielian to Mexican folk tunes. Alicia Alonso and Igor Youskevitch headed the company, with Nina Novak, Irina Borowska, Gertrude Tyven, Yvonne Chouteau and Alan Howard.

The Royal Danish Ballet, during a six-week tour, presented many ballets new to the United States: Auguste Bournonville's *La Sylphide*, *Konservatoriet*, *Napoli* and *La Ventana*; Frederick Ashton's *Romeo and Juliet*; and the oldest ballet still danced in its original choreography, Vincenzo Galeotti's *The Whims of Cupid*, staged in 1786. The brilliance and virtuosity of the men's dances and the excellent dance-acting made a vivid impression. Dancers included Mona Vangsaa, Margrethe Schanne, Inge Sand, Mette Mollerup, Kirsten Ralov, Kirsten Simone, Borge Ralov, Niels Bjoern Larsen, Svend Erik Jensen, Frank Schaufuss, Fredbjoern Bjoernsson, Stanley Williams and Henning Kronstam, with Vera Volkova as artistic director.

For the Metropolitan Opera Ballet, Zachary Solov choreographed *Soirée*, with music by Benjamin Britten after Gioacchino Rossini, costumes by Cecil Beaton. Mary Ellen Moylan, Carmen de Lavallade and Oleg Briansky were featured dancers. Tudor was appointed director of the Metropolitan Ballet and Mattlyn Gavers ballet mistress, Solov remaining as principal choreographer. Anna Sokolow was choreographer for the New York City Opera.

For performances at the Juilliard School of Music, Doris Humphrey choreographed *Theatre Piece No. 2*, danced by José Limon's company, music by Otto Luening. Limon staged *Variations on a Theme*, music by Norman Dello Joio. William Schuman's *Symphony for Strings*, choreographed by Limon, was presented. The Juilliard Dance Theatre appeared in works by Humphrey and Limon.

At the Empire State Music festival, Ellenville, N.Y., Limon choreographed *The Emperor Jones*, with a score by Heitor Villa-Lobos. The American Dance festival at New London, Conn., presented works by Humphrey, Limon, Sokolow, Birgit Akesson, Ruth Currier, Margret Dietz, Pauline Koner and Alwin Nikolais.

At the Jacob's Pillow festival, directed by Ted Shawn, the San Francisco Ballet made its east coast debut, dancing Balanchine's *Concerto Barocco* and six ballets by its director, Lew Christensen. Sally Bailey, Nancy Johnson and Conrad Ludlow led the dancers, with James Graham-Lujan as artistic director. Participants in this festival included Arova, Borowska, Hayden, Lavallade, Novak, Danielian, Howard, Moncion, Sanders, Lotte Goslar, Carola Goya, Rebecca Harris, Mia Slavenska, Lois Smith, Ruth St. Denis, Emy St. Just, Sahomi Tachibana, David Adams, Merce Cunningham and Matteo. Shawn starred in *The Bajour*, choreographed by Myra Kinch.

New York performances were given by Marceau, Antonio, Carmen Amaya, Paul Draper, Katherine Dunham, Irene Hawthorne, the Azuma Kabuki dancers, Valerie Bettis, Hadassah, Letitia Jay, Geoffrey Holder, Lewis Johnson and the William Dollar company.

New Yorkers journeyed to the Brooklyn Academy of Music to

see the National Ballet of Canada, Dance Theatre Berlin, Alexandra Danilova, José Greco, May O'Donnell, Sybil Shearer, Pearl Lang, Talley Beatty, Darsonval and Kinch's company, with Shawn as guest artist.

Ballet played an important part in the Chicago Lyric theatre season, with Ruth Page as choreographer for Claudio Monteverdi's masque *Il Ballo delle ingrate* and the ballets *Revenge* and *The Merry Widow*. Dancers included Alicia Markova, Vera Zorina, Barbara Steele, Arova, Briansky, Bentley Stone and Kenneth Johnson. The Page ballets were later presented in New York, with a tour, starring Marjorie Tallchief and George Skibine, planned for late 1956. Page later choreographed *Rosina and the Barber* for her Chicago group.

Throughout the country, regional ballet companies were increasingly active. The University of Utah Ballet, directed by William Christensen, gave *The Nutcracker*. The Southern Ballet, headed by Karen Conrad and Pittman Corry, produced *The Dogwood Legend* and *Juliet of the Hills*. The Stone-Camryn Ballet, Chicago, presented Walter Camryn's *Trio* and Bentley Stone's *The Wall*. Crescent City Ballet (New Orleans), Cornish Ballet (Seattle), Tarot Dance Theatre (Milwaukee), Portland Ballet society (Portland, Ore.) and Richmond Civic Ballet (Richmond, Va.) were among the many groups reflecting widespread interest in the dance.

Danilova, Iva Kitchell, Miriam Marmein, Pearl Primus, Marina Svetlova, Teresa and Luisillo and the Robert Joffrey Theatre Dancers made extensive American tours.

Genevieve Oswald, curator of the dance collection of the New York Public library, received the Capezio award. The library held exhibitions on Pavlova and the Royal Danish Ballet.

England.—The event of the year was the first performance, Oct. 3, of the Bolshoi Theatre Ballet at Covent Garden Opera house. The Moscow company, headed by Galina Ulanova and Yuri Zhdanov, danced *Romeo and Juliet*, music by Sergei Prokofiev. Later *Giselle*, *Lac des cygnes* and *The Fountain of Bakhchisarai* were presented. Dancers included Raissa Struchkova, Nina Timofeyeva, Nina Chistova, Marina Kondratieva, Ludmilla Bogomolova, Rinna Karelskaya, Nadezhda Kapustina, Velta Vilcin, Alexei Yermolaev, Sergei Koren, Georgei Farman-yants, Yuri Gosman, Gleb Yevdokimov and Alexander Radunsky. By western standards the choreography appeared old-fashioned, but the dancing and acting were considered superb.

Sadler's Wells Ballet, directed by Ninette de Valois, celebrated its 25th anniversary with a gala performance at which Ashton's *Birthday Offering* was produced. The principal dancers participated: Margot Fonteyn, Beryl Grey, Violetta Elvin, Nadia Nerina, Svetlana Beriosova, Rowena Jackson, Elaine Fifield, Michael Somes, Philip Chatfield, David Blair, Alexander Grant, Bryan Ashbridge, Desmond Doyle, Brian Shaw. The company produced *Noctambules*, choreography by Kenneth Macmillan, music by Humphrey Searle, and *La Peri*, choreography by Ashton, music by Paul Dukas. *Entrée japonaise*, a solo arranged by Ashton for Fonteyn, had its London *première*. At the Edinburgh festival, the company presented *The Miraculous Mandarin*, choreography by Alfred Rodrigues, music by Bela Bartok. The Benesch system of dance notation was introduced at Sadler's Wells school.

Sadler's Wells Theatre Ballet, with John Field as its new resident director, toured extensively in the British provinces. The company produced *Somnambulism* and *Solitaire*, both choreographed by Macmillan, and *Saudades*, by Rodrigues.

Sadler's Wells Choreographic group presented experimental ballets.

London Festival Ballet, directed by Anton Dolin, had a long summer season at Festival hall. It presented *Les Deux errants*, choreography by Wolfgang Brunner, music by Bill Russo, and

Coppélia, staged by Harald Lander. Serge Grigoriev and Lubov Tchernicheva supervised the ballets of Michel Fokine. For the wedding of Prince Rainier of Monaco, the company produced *Homage to the Princess*, choreography by Michael Charnley, music by Stan Kenton. Dancers included Toni Lander, Belinda Wright, John Gilpin, Michael Hogan and, as guest artist, Flemming Flindt.

Marie Rambert received the Queen Elizabeth II Coronation award, presented by the Royal Academy of Dancing. Ballet Rambert toured Italy, England and Spain. Markova was guest artist during the Llangollen Eistedfodd in Wales.

Roland Petit's Ballets de Paris appeared in London. During Ballet Theatre's London season, Agnes de Mille danced *Rodeo*. Pilar Lopez presented *El Amor Brujo*, *Le Tricorne* and *Bolero*. A Pavlova memorial collection of dance books was established at the Westminster Central Reference library.

France.—Paris Opera Ballet produced *Concerto aux Etoiles*, choreography by Lander, music by Bartok, with Yvette Chauviré and Peter van Dijk in leading roles. Serge Lifar choreographed Prokofiev's *Romeo and Juliet*, with Michel Renault and Liane Daydé as protagonists. Claude Bessy was named *première danseuse étoile* and Jacqueline Rayet *première danseuse*.

The Stanislavsky Ballet of Moscow, directed by Vladimir Bourmeister, made its Paris debut. Ballets included *Lac des cygnes*, *Straussiana*, *Happy Shores* and *Merry Wives of Windsor*. Dancers, all trained at the Bolshoi Theatre Ballet school, included Eleanora Vlassova, Sophia Vinogradova, Alla Ossipenko, Yuri Kondratov, Alexis Tchitchinadze, Sviatislov Kouznetsov and U.S.-born Violetta Bovt. The June season was the first ever presented in western Europe by a full-scale Soviet ballet company. The Moscow State Folk Dance group, directed by Igor Moiseyev, also danced in Paris.

The Grand Ballet du Marquis de Cuevas toured Europe and produced ballets choreographed by Skibine, Leone Mail, Ana Ricarda and James Starbuck. Principal dancers were Marjorie Tallchief, Jacqueline Moreau, Genia Melikova, Serge Golovine, George Zoritch, Wladimir Skouratoff and Oleg Tupine.

Roland Petit's Ballets de Paris produced a jazz ballet, *Les Belles damnées*, and a murder ballet, *La Chambre*, with a story by Georges Simenon. Ballets Jean Babilée was organized, with Claire Sombert, Alexandre Kalioujny, Iovanka Biegovich and Dick Sanders. Walter Gore choreographed *The Seasons* for Les Ballets 1956, headed by Milorad Miskovitch.

Janine Charrat's company toured France and Switzerland and produced *High Voltage*, choreography by Maurice Bejart. Leonide Massine choreographed a Mozart *Divertimento* for the Enghien festival. Michele Seigneuret received the Prix René Blum. John Taras staged a ballet masque, *Fanfares pour le prince*, for the wedding of Prince Rainier of Monaco.

Australia.—For the Borovansky Ballet, David Lichine choreographed *Corrida*; Yurek Shabelevsky staged Massine's *Les Présages*. American dancers, Jacqueline Vollmar, Charles Dickson and Ron Murray, joined the company. Katherine Dunham toured Australia.

Austria.—The Vienna State Opera house, reconstructed since World War II, reopened. Erika Hanka and Gordon Hamilton directed the ballet. *Giselle* was presented, with Margaret Bauer and Erika Zlocha. Hanka choreographed *Othello*, music by Boris Blacher. Hamilton staged the *Don Quixote pas de deux*. Hanka's versions of Prokofiev's *Classical Symphony* and Christopher von Gluck's *Don Juan* were revived.

Belgium.—At the Théâtre de la Monnaie, Brussels, Jean Etcheverry choreographed *Candide* and *The Miraculous Mandarin*; Dolin staged *Giselle*. For the Royal Opera, Antwerp, Jacques Milliaud choreographed Igor Stravinsky's *Orpheus*.

Canada.—National Ballet of Canada, directed by Celia Franca,

produced *The Nutcracker* and added Tudor's *Dark Elegies*. Elizabeth Leese choreographed *The Lady From the Sea*.

Les Grands Ballets Canadiens was organized in Montreal by Ludmila Chiraeff. Stravinsky's *Les Noces* was produced. Montreal Theatre Ballet made its debut.

The Royal Winnipeg Ballet produced *The Devil in the Village*, choreography by Nenah Lhotka; *Parable*, choreography by Gweneth Lloyd; and *Clasico*, choreography by Paddy Stone. Ruthanna Boris and Frank Hobi were engaged to head the company; Boris' *Pasticcio* was produced.

Cuba.—Ballet Alicia Alonso produced Prokofiev's *Romeo and Juliet*, choreography by Alberto Alonso. Alicia Alonso staged *Narcissus and Echo*.

Denmark.—Frank Schaufuss was named ballet master of the Royal Danish Ballet, replacing N. B. Larsen, who became director of the Tivoli Pantomime Theatre but continued to dance in the Royal Danish Ballet. Jerome Robbins staged *Fanfare*; Dolin staged *Pas de quatre*; Bournonville's *Far From Denmark* was revived.

Germany.—At the Berlin City Opera (west zone), Tatiana Gsovsky staged *The Sleeping Beauty*. The Deutsche Staatsoper (east zone) presented *Gayne*. Gluck's *Don Juan* was given at the Komische Oper.

The Munich Opera presented *Giselle* and several ballets choreographed by Alan Carter; Peggy van Praagh staged De Valois's *The Rake's Progress*. In Hanover, Yvonne Georgi choreographed *Orpheus*, *Othello* and *The Nutcracker*. In Düsseldorf, Kurt Jooss produced Carl Orff's *Catulli Carmina*.

Iran.—William Dollar supervised the establishment of a government-sponsored ballet school in Tehran.

Israel.—Inbal, directed by Sara Levi-Tanai, produced *Yemenite Life* and *At the Gates of Zion*.

Italy.—Guest dancers and choreographers were featured in ballet performances at La Scala, Milan. Violette Verdy, Tamara Toumanova, Babilée, Vyroubova and Markova appeared in works staged by Massine, Rodrigues, Lifar, Charrat, Antonio and Ugo dell'Ara. Aurel Milloss choreographed ballets for the Florence festival.

Japan.—The Komaki Ballet produced *Nichirin*, *Petrouchka* and Tschaikovsky's *Fourth Symphony*. Arova and Job Sanders were guest artists in *The Sleeping Beauty*. Martha Graham toured Japan.

Mexico.—*El Mensajero del sol*, choreographed by Guillermina Penalosa, was presented in Mexico City. Ballet Concierto toured Mexico. Sokolow and Cunningham taught in Mexico City, at government invitation.

Netherlands.—The Netherlands Ballet presented *Giselle* and *Petrouchka*. Gore choreographed *Ginevra*; Van Dijk staged *Portrait d'un Maudit*. Ballet der Lage Landen presented *Paysage Triste*, choreography by Jack Carter. The Amsterdam Opera Ballet presented *Claire* and *Phèdre*, choreographed by Françoise Adret.

Norway.—The Norwegian Opera Ballet was organized in Oslo, with Robert Lunnun as ballet master. *Les Sylphides*, *Swan Lake* and *Pulcinella* were presented. Birgit Cullberg staged her *Medea*. Dancers included Grete Moller, Edith Roger and Jorunn Kirkenuer, with Fonteyn and Sones as guest artists.

South Africa.—Danilova and Franklin toured South Africa. Fonteyn and Sones danced at the Johannesburg festival. Merle Parke and Gary Burne toured Rhodesia.

South America.—At the Colón theatre, Buenos Aires, Tamara Grigorieva staged *La Valse* and *Concerto coreografico*; Michel Borowski choreographed *El Junco*.

At the Teatro Municipal, Rio de Janeiro, Massine choreographed *Hymn to Beauty*, music by Francisco Mignone, and staged *Le Tricorne* and *Gaité parisienne*. Igor Schwiezoff revived



Concerto Dancante.

In Santiago, Chile, Ernst Uthoff revived *Coppélia* and *The Green Table*; Patricio Bunster choreographed *Bastien and Bastienne*. Vadim Sulima's Classical Ballet company produced *Graduation Ball*.

In Guatemala, the Bellas Artes Ballet, directed by Denis Carey, produced *Peter and the Wolf*, *Sombreros y sueños* and Gluck's *Don Juan*.

In Lima, Peru, Dimitri Rostoff produced Fokine's *Paganini*. Nathalie Krassovska danced *The Firebird*. Roberto Ximenez, Manolo Vargas, Renate Schottelius and Toumanova toured South America.

Sweden.—For the Royal Swedish Opera, Stockholm, Mary Kreeping staged *Giselle*, with Elsa Marianne von Rosen, Gunnel Lindgren and Ellen Rasch. Massine staged and danced in *Le tricorne* and *Gaité parisienne*; Mariane Orlando appeared in his *Le sacre du printemps*. Guest artists included Struchkova, Konstantinov, Elvin and Svetlova.

Goteborg organized a ballet company, for which Massine staged *Le Beau Danube*.

Turkey.—The Turkish State Ballet, developed from the State Ballet school, founded in 1949, made its debut, with Molly Lake and Travis Kemp as directors.

U.S.S.R.—The repertory of the Kirov theatre, Leningrad, included *The Bronze Horseman*, danced by Nonna Yastrebova and Boris Bregvadze; *Giselle*, with Natalia Dudinskaya; and Fokine's *Chopiniana*.

At the Bolshoi theatre, Moscow, Olga Lepeshinskaya danced *Coppélia*, with Farmanyants; Maya Plisetskaya appeared in *Lautia*, choreographed by Vahktang Chabukiani. Ulanova danced frequently. The Filial theatre, Moscow, produced *Shurale*, choreography by Leonid Yacobson.

Yugoslavia.—In Split, Ana Roje prepared a production of *Giselle*. (LN. M.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Steps of the Ballet* (1950).

Ballroom Dancing.—The year 1956 brought two novelty ballroom dances into international prominence: the cha-cha and the rock 'n' roll.

The cha-cha, originally called cha-cha-cha, became top choice advanced Latin dancing not only in the Americas but wherever

SOVIET BALLET COMPANY in a performance of *Romeo and Juliet* on the opening night of their engagement at Covent Garden theatre, London, Eng., Oct. 3, 1956

Cuban music was known. The cha-cha stemmed from mambo, which was an offshoot of the more staid Cuban dances such as the rumba, dansant and son. Each change in the development of these Latin dances added syncopation, but despite the prevalence of swing styling, cha-cha was danced more by adults than by teenagers.

There were many new recordings of cha-cha, but the best known were by Cuban orchestras and were exported all over the world through popular demand. Among the favourites were "Poco Pelo," "Pedro Pablo," "Cha-Cha in Blue" and "Coco Seco."

Rock 'n' roll began its rise to popularity in the United States in 1955, and by 1956 had spread, internationally, among teenagers and young adults. It is a form of jitterbug plus jumps, and the enthusiasts prefer fast tempo. There was no doubt of the overwhelming effect of the music on both dancers and avid listeners. The *New York Times* gave a half-page account in September of a riot that took place in London, Eng., during a rock 'n' roll jam session; the *Manchester Guardian* reported similar excitement in Manchester, Eng., and other cities in England and Scotland.

In the United States, a singer named Elvis Presley rose meteorically through such rock 'n' roll recordings as "Don't Be Cruel," "I Want You, I Need You, I Love You" and "Hound Dog." Other top rock 'n' roll numbers were "Why Do Fools Fall in Love," "Rock Around the Clock" and "See You Later, Alligator" ("alligator" is a jive term for a rock 'n' roll dancer).

Among other dances, the fox trot continued to hold its international first place. The most popular rhythmic numbers were "Autumn Leaves" and "Poor People of Paris," danced in conventional style with little change in step patterns.

The waltz had a standard place in ballroom dancing. Two new compositions that were unusually popular in 1956 were "Allegheny Moon" and "Che Sera Sera," the latter adapted from an Italian folk song.

The merengue, which made such a strong start in 1955, declined in favour along with the samba, and the mambo was superseded by cha-cha. The tango had some revival in England and

the United States, probably because of the great popularity of a tango dance number called "Hernando's Hideaway" from the musical *The Pajama Game*.

Square dancing, with its intricate but standardized steps and "calls," held the interest of its devotees. In July 1956 dancers from 38 states, Canada and Great Britain attended the International Round and Square Dance festival in Missouri.

(A. MU.)

Dates: see FRUIT.

Daughters of the American Revolution, National Society of: see SOCIETIES AND ASSOCIATIONS, U.S.

Dead Sea Scrolls: see ARCHAEOLOGY; JEWISH LITERATURE; JUDAISM.

Deafness: see HEARING.

Deaths (of prominent persons in 1956): see OBITUARIES.

Death Statistics. The level of mortality in the United States remained low during 1956. The death rate in the first eight months was 9.4 per 1,000 population, slightly higher than for the like period of the previous year. During the whole of 1955 about 1,527,000 deaths were registered and the death rate was 9.3 per 1,000 population, excluding the armed forces overseas. This was only slightly above the record low of 9.2 reported in 1954.

For the United States, the death rates per 1,000 population of stated age in 1955 were: under one year, 29.6; ages 1-14 years, 0.7; ages 15-24 years, 1.2; ages 25-34 years, 1.5; ages 35-44 years, 3.1; ages 45-54 years, 7.5; ages 55-64 years, 17.4; ages 65-74 years, 39.4; ages 75-84 years, 89.1 and age 85 and over, 178.2. For all ages combined, both white males and females recorded small increases in their 1955 rates, as compared with 1954; on the other hand, nonwhite males and females showed decreases. The death rates per 1,000 population by race and sex for 1955 were: 10.7 for white males; 11.2 for nonwhite males; 7.8 for white females; and 8.7 for nonwhite females.

As in previous years, diseases of the heart was the leading cause of death during 1955 in the United States, accounting for 37.9% of all deaths. Malignant neoplasms (cancer and allied conditions) were second in importance, being responsible for 15.9% of the total mortality. The ranking of the ten leading causes of death is set forth in Table I. The causes associated with maternity accounted for only 1,950 deaths in the United States in 1955, the rate being 4.8 per 10,000 live births; this compares with a rate of 20.7 per 10,000 live births in 1945.

Table I.—Estimated Death Rates, Rank Order and Percentage of Total Deaths for the Ten Leading Causes of Death, United States, 1955

Rank	Cause	Death rate per 100,000 pop.	Percentage of total deaths
1	Diseases of heart	147.6	15.9
2	Malignant neoplasms, including neoplasms of lymphatic and haematopoietic tissues	106.6	11.5
3	Vascular lesions affecting central nervous system	55.6	6.0
4	Accidents	39.8	4.3
5	Certain diseases of early infancy	27.5	3.0
6	Influenza and pneumonia, except pneumonia of newborn	19.4	2.1
7	General arteriosclerosis	15.2	1.6
8	Diabetes mellitus	11.9	1.3
9	Congenital malformations	10.8	1.2
10	Cirrhosis of liver		

Source: National Office of Vital Statistics, *Monthly Vital Statistics Report*, vol. iv, no. 13, pt. 2 (May 28, 1956).

The expectation of life at birth in the United States reached a new high of 69.6 in 1954. This established a gain of 22½ years since 1900. White females had an expectation of life at birth of 73.6 years in 1954, for white males it was 67.4 years, for nonwhite females 65.8 years and for nonwhite males 61.0 years.

Canada reported an increase of 3% in deaths during the first eight months of 1956, as compared with the same period of the year before. The number of deaths in Canada for the entire year

Table II.—Death Rates per 1,000 Population From All Causes in Selected Countries for 1954 and 1955

Country	1955	1954	Country	1955	1954
North America			Luxembourg	11.3	11.4
United States	9.3	9.2	Netherlands	7.6	7.4
Canada	8.2	8.2	Norway	8.3	8.2
Costa Rica	10.5	10.6	Portugal	11.3	10.5
Dominican Republic	9.5	8.8	Spain	9.4	9.2
Guatemala	20.5	18.5	Sweden	9.4	9.4
Honduras		11.2	Switzerland	10.1	10.1
Mexico	13.3	13.1	United Kingdom	11.7	11.5
Panama	9.3	9.0	Yugoslavia	11.4	10.9
Puerto Rico	7.1	7.5			
Salvador, El	13.9	15.0	Asia		
Trinidad and Tobago	10.2	9.8	Ceylon	11.0	10.5
South America			Formosa	8.6	8.6
Argentina	—	8.4	Hong Kong	8.2	8.1
Chile	12.8	13.1	India	12.7	13.5
Ecuador	14.8	16.1	Iran	9.7	7.7
Peru	6.5	9.1	Israel (Jewish pop.)	5.8	6.1
Uruguay	7.1	—	Japan	7.8	8.0
Venezuela	10.2	10.1	Singapore	—	9.1
Europe			Syria	4.7	5.2
Austria	12.1	12.1			
Belgium	12.6	11.9	Africa		
Czechoslovakia	9.6	10.4	Union of South Africa (European)	8.6	8.6
Denmark	8.8	9.1			
Finland	9.3	9.1	Oceania		
France	12.2	12.1	Australia	8.9	9.1
Germany (western)	10.8	10.4	New Zealand		
Ireland	12.6	12.1	Europeans	9.0	9.1
Italy	9.3	9.2	Maoris	—	9.1

Source: United Nations, *Monthly Bulletin of Statistics* (Oct. 1956); Office of Population Research, Princeton University, and Population Association of America, *Population Index* (July 1956); Canada, Dominion Bureau of Statistics, *Preliminary Annual Report of Vital Statistics* (1955).

1955 was 128,154, and the death rate was given as 8.2 per 1,000 population. England and Wales recorded slightly fewer deaths in the first half of 1956 compared with the same period of 1955. During the entire year 1955, England and Wales had 518,865 deaths, with a death rate of 11.7 per 1,000 population; this was 3.5% above the rate for 1954. In Australia, the death rate for 1955 (excluding aborigines) was 8.9 per 1,000 population, or 2% below the rate for the previous year. New Zealand reported a death rate of 9.0 per 1,000 population of European origin in 1955 and 1954. Table II shows death rates for a number of countries in 1954 and 1955.

(See also ACCIDENTS; CENSUS DATA, U.S.; DISASTERS; INFANT MORTALITY; SUICIDE STATISTICS.) (M. SP.)

Debt, National. The national debt of the United States at the end of fiscal year 1956 amounted to \$272,751,000,000, about \$1,600,000,000 lower than a year earlier. (See Table I.) In its Aug. 28, 1956, report reviewing the 1956

Table I.—National Debt of the United States

	June 30	(Millions of dollars)		June 30	(Millions of dollars)
1915		1,191	1947		258,282
1920		24,298	1948		252,225
1925		20,516	1949		252,772
1930		16,185	1950		257,331
1935		28,701	1951		255,221
1940		42,971	1952		259,101
1941		48,961	1953		266,071
1942		72,422	1954		271,261
1943		136,696	1955		274,371
1944		201,003	1956		272,751
1945		258,682	1957		271,401
1946		269,422			

Source: Data from 1915 to 1956 are from U.S. Department of the Treasury, *daily treasury statement* (revised); 1957 is estimate from "The 1957 Federal Budget and Year Review," Bureau of the Budget, Executive Office of the President, Aug. 28, 1956.

budget, the bureau of the budget estimated that the national debt would be further reduced to \$271,400,000,000 by June 30, 1957. The prospective decrease was attributed mainly to an anticipated budget surplus (estimated at \$707,000,000) in the fiscal year 1957.

The decline in public debt during fiscal 1956 was the first in five years. In the four fiscal years from 1952 through 1955, the public debt had expanded by more than \$19,000,000,000. The expansion followed a substantial reduction in public debt during the 1946-48 period and an irregular, moderate increase over the 1949-51 period. The national debt as of June 30, 1956, was about \$6,400,000,000 below the peak total of \$279,214,000,000 reached at the end of Feb. 1946.

In Aug. 1954 congress enacted legislation by which the stat-

tory debt limit of \$275,000,000,000, which had been in effect since mid-1946, was raised to \$281,000,000,000 until June 30, 1955. This legislation was extended for another year in June 1955. By an act of congress in July 1956, the statutory debt limit was set at \$278,000,000,000 for the fiscal year ending June 30, 1957.

The decrease in public debt during fiscal year 1956 stemmed primarily from a budget surplus of \$1,754,000,000 partly offset by an increase of \$331,000,000 in the treasury cash balance. The increases in national debt during 1952-55, in turn, had reflected mainly budget deficits.

As shown in Table II, the debt decrease in fiscal 1956 was concentrated in the nonmarketable category, with the principal change therein being the final redemption of treasury savings notes. Over the fiscal years 1952-55, marketable interest-bearing issues had increased by about \$17,300,000,000, absorbing more than nine-tenths of the net rise in total public debt. Such

Table II.—Changes in the United States Public Debt
(In millions of dollars)

	1952	Fiscal year ending June 30 1953	1954	1955	1956
Total public debt	3,883	6,966	5,189	3,114	-1,623
Marketable interest-bearing debt	2,490	6,927	3,019	4,852	-253
Treasury bills	3,605	2,488	-192	-1	1,294
Certificates of indebtedness	18,914	-12,570	2,551	-4,569	2,467
Treasury notes	-16,843	11,462	1,535	8,769	-4,777
Treasury bonds	-3,186	5,548	-875	654	762
Nonmarketable public debt	1,393	39	2,169	-1,738	-1,369
Special issues	3,086	2,799	1,691	1,021	1,864
U.S. savings bonds	113	201	175	304	-868
Other	-1,806	-2,961	303	-3,063	-2,365

Detail may not add to totals because of rounding.
Source: U.S. Department of the Treasury.

issues accounted for 57% of the debt total as of June 30, 1956. Through fiscal 1951, the post-World War II debt retirement program of the treasury had involved a large reduction in marketable interest-bearing securities. From the debt peak in Feb. 1946, when they formed 71% of the total public debt, marketable obligations were reduced nearly \$62,000,000,000 by the end of June 1951. During the last ten months of 1946, the funds used to retire aggregate maturities of more than \$23,000,000,000 were obtained chiefly from the general fund cash balance accumulated in the Victory Loan drive. In the period Jan. 1947-June 1951, funds for reducing the marketable public debt were derived mainly from the growth in nonmarketable issues.

Of the public debt total of \$272,751,000,000 as of June 30, 1956, interest-bearing debt amounted to \$269,883,000,000 and matured debt and debt bearing no interest amounted to \$2,868,000,000. The interest-bearing debt consisted of \$224,769,000,000 in public issues and \$45,114,000,000 in special issues held by the various governmental funds and agencies. The publicly held debt, in turn, was comprised of \$154,953,000,000 in marketable obligations and \$69,817,000,000 in nonmarketable obligations. Table III shows the maturity distribution of interest-bearing, publicly held marketable securities for the years 1952-56. Particularly noteworthy is that the volume of securities becoming due or callable within one year rose almost \$14,000,000,000 in fiscal 1956. This marked a reversal of developments in the preceding two fiscal years, when securities maturing within one

Table III.—Maturity Distribution of Interest-Bearing Publicly Held
U.S. Government Marketable Securities
(In millions of dollars)

	1952	1953	June 30 1954	1955	1956
Maturing:					
Within one year	70,851	75,943	63,244	51,132	64,910
Treasury bills	17,219	19,707	19,515	19,514	20,808
Certificates of indebtedness	28,423	15,854	18,405	13,836	16,303
Treasury notes	15,217	13,540	16,333	20,621	20,621
Treasury bonds	25,209	25,165	11,783	1,449	7,179
5 to 5 years	29,435	30,163	38,408	46,400	36,941
5 to 10 years	13,322	13,018	27,112	42,755	40,362
Over 10 years	26,708	28,138	21,544	14,901	12,738
Total*	140,316	147,261	150,308	155,186	154,953

*Excludes postal savings bonds. Detail may not add to totals because of rounding.
Source: U.S. Department of the Treasury.

year had been reduced by \$25,000,000,000. By the end of June 1956, the proportion that such securities formed of the marketable total amounted to 42%, as compared with 33% in the previous year and the postwar high of 52% registered on June 30, 1953.

In fiscal 1956 the banking system reduced its holdings of federal securities by \$6,400,000,000. (See Table IV.) Nonbank investors thus absorbed about \$5,000,000,000, as retirements amounted to about \$1,600,000,000.

The principal factor in the decline of bank holdings was the liquidation of government obligations by commercial banks. This was financed in part the heavy demand for loan accommodations on the part of businesses and persons.

The reduction in bank holdings of federal securities in fiscal 1956 may be viewed against the background of previous developments. As one of the measures adopted by treasury and federal reserve authorities to combat post-World War II inflation, a substantial reduction in bank ownership of federal securities was effected over the period from Feb. 1946 to June 1953. Securities held by the banking system declined from \$116,700,000,000 to \$83,600,000,000—or from 42% to 31% of total federal securities outstanding. During fiscal 1954 bank holdings of federal obligations expanded to \$88,700,000,000. They declined moderately in fiscal 1955 and then dropped to \$80,700,000,000, or 29½% of the total, in fiscal 1956.

Federal debt held by nonbank investors totalled \$192,200,000,000 at the end of June 1956, or \$5,000,000,000 more than a year earlier. Within this large category, insurance companies and mutual savings banks effected a further liquidation of federal obligations. The total holdings of individuals rose almost \$2,000,000,000 as higher-income investors purchased marketable bonds to take advantage of the relatively low prices and favourable yields offered by such securities. State and local govern-

Table IV.—Estimated Ownership of Federal Securities—Public Debt and
Guaranteed Securities
(In billions of dollars)

	Feb. 1946	June 1952	June 1953	June 1954	June 1955	June 1956
Total federal securities outstanding	279.8	259.2	266.1	271.3	274.4	272.8
Total held by banks	116.7	84.0	83.6	88.7	87.1	80.7
Commercial banks	93.8	61.1	58.8	63.6	63.5	56.9
Federal reserve banks	22.9	22.9	24.7	25.0	23.6	23.8
Total held by nonbank investors	163.1	175.2	182.6	182.6	187.2	192.2
Individuals	64.1	64.8	66.3	65.0	65.3	67.2
Insurance companies	24.4	15.7	16.0	15.3	14.8	13.3
Mutual savings banks	11.1	9.6	9.5	9.1	8.7	8.4
Other corporations	19.9	18.8	18.4	16.4	18.8	17.8
State and local governments	6.7	10.4	12.0	13.9	14.7	15.9
U.S. government investment accounts	28.0	44.3	47.6	49.3	50.5	53.5
Miscellaneous investors	8.9	11.6	12.8	13.7	14.4	16.2

Detail may not add to totals because of rounding.
Source: U.S. Department of the Treasury.

ments, U.S. government investment accounts and miscellaneous investors continued to invest their accumulating pension and welfare reserves in federal bonds. Corporate holdings dipped \$1,000,000,000 as companies liquidated their holdings to pay income taxes and finance expansion programs.

During the fiscal year 1956, interest rates on both short-term and long-term federal securities continued to rise from the lows reached in June 1954. These advances reflected the heavy demand for borrowed funds on the part of businesses, persons and state and local governments during the entire fiscal year.

Short-term rates rose considerably faster than did long-term rates, and by June 1956 were about one-sixth above the previous peak of June 1953. Long-term rates, on the other hand, had not quite regained their postwar highs by mid-1956. These rates commenced to rise after the treasury-federal reserve "accord" of March 1951, when the federal reserve in its government security operations began placing greater emphasis on the supply and availability of bank reserves and less emphasis on maintaining fixed prices of federal obligations. After advancing by one-fourth from March 1951 to June 1953 and attaining the highest point

since the early 1930s, the average yield on long-term treasury bonds dropped sharply during fiscal 1954. Almost all of this decline was recovered in the subsequent advance through June 1956.

Interest payments by the federal government, consisting almost wholly of charges on the public debt, approximated \$6,-850,000,000 in fiscal 1956. This was about \$400,000,000 higher than payments in each of the two preceding fiscal years. In its Aug. 28, 1956, report on the 1957 budget, the bureau of the budget estimated that total interest payments by the federal government in fiscal year 1957 would amount to \$7,156,000,000. The anticipated increase over fiscal 1956 reflected higher interest rates.

U.S. State and Local Government Debt.—The latest official estimates available in 1956 of the aggregate debt of state

and local governments in the United States are shown in Table V. State and local debt amounted to \$43,200,000,000 at the end of June 1955, an increase of \$5,300,000,000 during the fiscal year. It was evident from available information on the volume of new offerings that the rise in such indebtedness continued into fiscal 1956.

These developments were an extension of past trend in the postwar period. After dropping from \$20,246,000,000 in 1940 to \$15,922,000,000 in 1946, the debt of state and local governments expanded steadily to the total of more than \$43,000,000,000 in 1955. In relative terms, the 1946-55 increase in indebtedness was much larger for state governments than for local governments.

Construction outlays occasioned a very large share of all borrowing by state and local governments in the 1946-55 period. In addition to projects that had been postponed from the pre-1946 period, such outlays stemmed from requirements created by the rapid postwar rise in street and highway traffic and in the school-age population.

Other Countries.—In Table VI are presented data on the national debts of many countries of the world. Insofar as permitted by available information, the data are shown for 1939 and for a late postwar year, affording a comparison of national debts before and after World War II.

(See also BUDGET, NATIONAL; TAXATION.)

(C. F. Sz.)

Table V.—Debt of State and Local Governments, U.S.

		(In millions of dollars)			
June 30	Total	State	Local	June 30	Total
1929. . .	17,234	2,300	14,934	1947. . .	16,825
1933. . .	19,802	3,018	16,784	1948. . .	18,702
1937. . .	19,594	3,276	16,318	1949. . .	20,875
1940. . .	20,246	3,526	16,720	1950. . .	24,191
1941. . .	20,226	3,413	16,813	1951. . .	27,040
1942. . .	19,690	3,211	16,479	1952. . .	29,624
1943. . .	18,692	2,909	15,783	1953. . .	32,735
1944. . .	17,471	2,768	14,703	1954. . .	37,904
1945. . .	16,589	2,425	14,164	1955. . .	43,200
1946. . .	15,922	2,358	13,564		11,800

Source: U.S. Department of Commerce.

Table VI.—National Debt of Various Countries

Country	Total debt	Total debt
(Unit of currency)*	Date	Date
	(1000,000s)	(1000,000s)
Argentina (peso)	12/31/39	4,794
Australia (pound-Aust.)	6/30/39	1,215
Austria (schilling)	12/31/37	3,495
Belgium (franc)	12/31/39	47,544
Bolivia (boliviano)	12/31/39	4,192
Brazil (cruzeiro)	12/31/39	18,885
Bulgaria (lev)	12/31/39	22,864
Burma (kyat)	9/30/40	574
Canada (dollar-Canadian)	3/31/39	3,710
Ceylon (rupee)	9/30/39	141
Chile (peso)	12/31/39	4,227
China (dollar-C.N.)	12/31/39	4,190†
Colombia (peso)	12/31/39	180
Costa Rica (colon)	12/31/39	133
Cuba (peso)	2/28/39	229
Czechoslovakia (koruna)	12/31/39	38,449
Denmark (krone)	3/31/39	1,506
Dominican Republic (peso)	12/31/41	20
Ecuador (sucro)	12/31/39	426
Egypt (pound-Egyptian)	4/30/39	95
Finland (markka)	12/31/45	87,752
France (franc)	12/31/39	482,967
Germany, Western (Deutschemark)	3/31/49	4,987
Greece (drachma)	3/31/39	52,138
Guatemala (quetzal)	6/30/39	13
Haiti (gourde)	9/30/39	48
Honduras (lempira)	6/30/39	18
Hungary (pengo)	6/30/39	1,937
Iceland (króna)	12/31/39	56
India (rupee)	3/31/39	11,851
Iran (rial)	3/20/40	2,111
Iraq (Iraqi dinar)	1/1/39	2
Ireland, Republic of (pound)	3/31/39	61
Italy (lira)	6/30/39	145,795†
Japan (yen)	3/31/39	17,921
Malaya, Federation of (Malayan dollar)	12/31/49	253
Mexico (peso)	12/31/39	1,500
Netherlands (guilder)	12/31/39	4,218
New Zealand (pound-N.Z.)	3/31/39	313
Nicaragua (córdoba)	6/30/42	26
Norway (krone)	6/30/39	1,528
Panama (balboa)	12/31/39	21
Paraguay (peso)	10/31/39	3,340
Peru (sol)	12/31/39	833
Philippines (peso)	6/30/46	146
Poland (zloty)	3/31/39	5,318
Portugal (escudo)	12/31/39	7,145
Rumania (leu)	3/31/39	107,716§
Salvador (colón)	12/31/39	38
Spain (peseta)	12/31/39	24,127
Sweden (krona)	6/30/39	2,634
Switzerland (franc)	12/31/39	2,589†
Thailand (baht)	3/31/39	73
Turkey (pound-Turkish)	5/31/39	557
Union of South Africa (pound-S.A.)	3/31/39	279
Union of Soviet Socialist Republics (rouble)	12/31/37	28,766†
United Kingdom (pound)	3/31/39	7,269
United States of America (dollar)	6/30/39	40,440
Uruguay (peso)	12/31/39	410
Venezuela (bolivar)	6/30/39	3†

*For approximate value of various currencies see Exchange Control and Exchange Rates.

†Domestic debt only.

‡Not strictly comparable with the 1939 figure.

§Long-term domestic debt and foreign debt.

Source: United Nations, Department of Economic Affairs.

Defense, U.S. Department of: see BUDGET, NATIONAL GOVERNMENT DEPARTMENTS AND BUREAUS, U.S.

Delaware. Delaware, on the middle Atlantic seaboard, one of the original 13 states of the United States, is called the "First state," having been the first to ratify the federal constitution, Dec. 7, 1787. The "Diamond state" is also a popular name. Area: 2,057 sq.mi. (land 1,978 sq.mi.; inland water 79 sq.mi.). Population: (July 1, 1956, provisional est.) 402,000; (1950 U.S. census) 318,085.

The principal city of Delaware is Wilmington (pop. 1950 census) 110,356. Other cities, with 1950 populations, are Dover (cap.) 6,223; Newark 6,731; New Castle 5,396; Elsmere 5,341; Milford 5,179.

History.—Outstanding legislation in 1956 by the held-over session of the 1955 general assembly was an increase of the school-building program to \$55,000,000; a program of substantial salary increases to teachers and all public school employees; authorization to the state highway department to build limited-access roads out of revenue (above interest and retirement obligations) from the Delaware Memorial bridge (congress was expected to amend the bridge charter accordingly); a bonus for all Korean war veterans.

During the first nine months of 1956 new construction of all types (except privately built homes) amounted to \$70,027,216 including industrial, \$21,000,050; commercial, \$4,058,142; institutional and public, \$25,362,024; group housing, \$19,027,216.

The chief state officers in 1956 were: governor, J. Caleb Boggs; lieutenant governor, John W. Rollins; secretary of state, John N. McDowell; tax commissioner, C. Douglass Buck; bank commissioner, Randolph Hughes; state treasurer, Howard H. Dickerson; auditor of accounts, Clifford E. Hall; chief justice, Clarence A. Southerland; chancellor, Collin J. Seitz; president judge, Charles S. Richards; attorney general, Joseph Donald Craven; adjutant general, Brig. Gen. Joseph J. Scannell; director, legislative reference bureau, Andrew Christie; director, state development department, Miles L. Frederick.

In the Nov. 1956 election 98,057 Delaware votes were cast for Pres. Dwight D. Eisenhower against 79,421 for Adlai Stevenson. A high proportion of registered voters, 94%, went to the polls.

Delaware's one congressman, Harris B. McDowell, Jr., Democrat, was defeated for re-election by Harry G. Haskell, Republican. State offices filled at the election were: governor, J. Caleb Boggs (Rep.), re-elected; lieutenant governor, David P. Buckson (Rep.); treasurer, Mrs. Vera G. Davis (Rep.); auditor of accounts, Dale E. Wheatly (Rep.).

Education.—The state appropriation for operation of the public schools in the 1956-57 fiscal year was \$20,240,478. Elementary schools had an enrolment of 39,183 and a teaching staff of 1,484. Secondary schools had an enrolment of 24,753 and teaching staff of 1,203. For the fiscal year ending June 30, 1956, the state board of vocational education placed 480 disabled persons in earning jobs. The state superintendent of public instruction was George R. Miller, Jr.

Social Insurance and Assistance, Public Welfare and Related Programs.—State unemployment compensation paid for the fiscal year ending June 30, 1956, was \$1,875,673. Active claims on Oct. 13, 1956, were 4,000. The cost of general assistance for the fiscal year ending June 30, 1956, was \$688,152 for an average of 1,048 cases per month. On Oct. 1, 1956, 1,601 persons were receiving old-age pensions.

During the same fiscal year a monthly average of 1,149 children were cared for in their own or foster homes at a cost of \$322,730. The number of dependent children aided averaged 1,153 per month at a cost of \$157,045.

State appropriations for public welfare in 1956 amounted to nearly \$5,000,000, including support of the state health centre and the state welfare home, care of the mentally ill and mentally retarded, crippled children, industrial schools and homes for the aged.

The state board of corrections in the fiscal year ending June 30, 1956, received at the New Castle County institution 3,203 prisoners and discharged 3,091. The total number of prisoners in the three county institutions on June 13, 1956, was 719.

Communications.—The mileage of all highways and rural roads was 3,983. The income of the state highway department for the fiscal year was \$13,009,226, including federal aid of \$2,486,186. Railroad mileage was approximately 350. During the year ending May 31, 1956, 8,463,935 vehicles crossed the Delaware Memorial bridge; revenue, \$7,229,769.55.

For the year ending Oct. 1, 1956, tonnage at the port of Wilmington was 740,656, value of cargoes \$48,029,797. On Oct. 1, 1956, the state had 107,354 main telephones in use.

Banking and Finance.—On June 30, 1956, there were 60 state banks and trust companies, including branch banks and offices, having total resources of \$622,322,309. Assets of 8 national banks were \$33,213,805. Demand deposits of state banks and trust companies increased by \$17,153,690, savings deposits by \$5,478,334 during the fiscal year. Savings deposits in the 10 mutual savings banks increased by \$6,338,651.

Total state receipts for the year ending June 30, 1956, were \$101,161,605, of which \$50,071,700 was from taxes and \$51,089,905 from special funds. The cash balance at the beginning of the year was \$6,653,212. Expenditures were \$89,814,282. The gross debt was \$84,491,000 and total debt service (interest and redemptions) amounted to \$5,799,798.

Agriculture.—Cash income from agricultural production in the first seven months of 1956 was \$60,574,000, of which \$42,958,000 was from livestock and \$17,616,000 from crops. The total cash income for 1955 was \$101,066,000, of which \$76,448,000 was from livestock, \$24,728,000 from crops, and \$186,000 from government payments.

Manufacturing.—Gross receipts of 783 licensed manufacturers for the year ending June 30, 1956, were \$637,156,192, compared with 816 for the previous year with gross receipts of \$698,450,745. The average number of employees under the unemployment compensation law for the year ending March 31, 1956, was 123,000. Total wages paid for the year ending June 30, 1956, were \$553,191,908. The Wilmington area quarterly survey of employment Aug. 15, 1956, showed 77,044 employed by 559 employers compared with 72,403 by 557 employers on the same day in 1955. New corporations chartered at Dover for the year ending June 30, 1956 were 616 compared with 3,692 the previous year. Corporations that became paid were 1,109 compared with 1,065 the year before. (J. EN.)

Mineral Production.—Delaware has the smallest mineral output of any of the states, and that almost entirely in building materials as given in

Table III.—Mineral Production of Delaware

	(In short tons)			
	Quantity	Value	Quantity	Value
Total		\$659,000		\$1,024,000
Sand and gravel	520,817	399,685	971,647	752,528
Stone	80,364	215,382	?	*
Other minerals . . . . .	...	43,930	...	271,263

*Value included with other minerals.
Source: U.S. Bureau of Mines.

Table III, which shows only those minerals valued at \$100,000 or more. However, Delaware was first in titanium output in 1954. The value of the minerals produced in the state was 0.01% of the U.S. total.

ENCYCLOPEDIA BRITANNICA FILMS.—Northeastern States (1955).

Democracy. The most remarkable event in the development of democracy in 1956 was the progressive extension of democratic principles to Asia and Africa. In western Europe and in North America the democratic process had struck such deep roots that after having successfully withstood the pressure of fascism and communism in the 1930s and in the 1940s, its validity was nowhere doubted.

Democracy in Europe, 1956.—Parliamentary elections were held in Europe in 1956 in Austria, Sweden, Netherlands and France. In Austria, the 11-year-old coalition of the Catholic Conservative party and of the Social Democrats continued, indicating a stable development of this strategically located country. In France, however, the elections to the national assembly held at the beginning of the year did not strengthen French democracy. The Communist party gained heavily in number of deputies on the one end of the political picture and on the other end a new neo-fascist party under the leadership of Pierre Poujade succeeded in filling 51 seats. Nevertheless, the French were able to establish a relatively stable middle-of-the-road government under a right wing socialist premier, who had to cope with the difficult problems of monetary inflation in France and nationalist unrest in French North Africa.

The revelations regarding Stalin's terror and misdeeds, which Nikita Khrushchev, the secretary general of the Soviet Communist party, discussed in a closed session before the 20th Communist party congress in Moscow in Feb. 1956, were an indirect help to democracy in Europe. Under their impact, some of the communist leaders and parties in western Europe were confused and shaken. Negotiations started in Italy for a fusion of anti-communist democratic socialists under the leadership of Giuseppe Saragat and the powerful left-wing socialists under Pietro Nenni, who so far had been faithful allies of the communists. Such a fusion would greatly strengthen the democratic cause in Italy, though some observers expressed doubts about the validity of the conversion of Nenni to democracy. But even more important were the repercussions of the new developments in the Communist party in some of the satellite countries in eastern Europe, especially in Poland. The Polish press and intellectuals started to discuss openly the need for greater liberty in Polish life. The Polish workers in Poznan went on strike and in bloody demonstrations on June 28 demanded not only bread and a living wage but political liberties and free elections. How far the democratization of the Italian socialist movement and the liberalization of the Polish regime would go was not yet clear; yet the year had witnessed the first hopeful beginning in the break of the communist grip on the labour movement and the social life in the two countries.

Democracy in Africa.—Two African territories which had been French protectorates, Morocco and Tunisia, achieved their independence in 1956. The former territory was hardly prepared for a democratic development, but the situation in Tunisia was much more promising. There, as a result of national elections, Habib Bourguiba established on April 10, 1956, the first democratic government in the history of Tunisia. Following the example of Turkey, the Tunisian government abolished polygamy

Table I.—Leading Agricultural Products of Delaware

Crop	Indicated 1956	1955	Average, 1945-54
Wheat, bu.	8,568,000	6,120,000	...
Corn, bu.	230,000	270,000	336,000
Oats, bu.	87,000	86,000	98,000
Hay, tons	957,000	908,000	1,099,000
Beet, bu.	3,105,000	2,100,000	914,000
Peas, bu.	79,000	95,000	159,000
Apples, bu.	370,000	380,000	221,000
Pears, bu.	532,000	476,000	335,000
Oranges, bu.	1,758,000	1,852,000	686,000*
Potatoes, cwt.	26,400	26,400	...
Potatoes, tons (processed)	65,000	26,000	...
Strawberries, crates (fresh market)	27,000	26,000	...
Beans, tons (processed)	18,900	14,180	...

*1949-54 average.
Source: U.S. Department of Agriculture.

Table II.—Principal Industries of Delaware
(Fiscal years ending June 30)

Industry	1956	1955
Manufacturing	\$92,736,484*	\$93,394,425
Wholesale trade	25,253,480	160,155,445
Retail trade	22,385,729	20,640,137
Household supplies	174,548,278	10,434,211
Food supplies	4,180,007	3,603,207
Drugs and medical supplies	889,827	3,894,650
Alcohol	317,162,387	406,328,670
Miscellaneous (the major part from chemicals)		

Gross receipts of manufacturers.

and changed the divorce laws in favour of the wives and their security after the western model. Literate women above 21 years of age received also the right to vote. The religious Islamic courts were abolished and replaced by secular courts. Thus Tunisia became, after Turkey, the first Mohammedan country to try to adopt traditional life to western democratic concepts and to protect the dignity of women, without, however, diminishing the respect for the precepts and position of the Mohammedan religion.

Even more far reaching were the democratic measures envisaged in the two British African colonies of Gold Coast and Nigeria; both of them looked forward to the rapid achievement of independence and the introduction of western parliamentary governments under British guidance in the immediate future. Even France, which so far had been strictly opposed to any form of real autonomy for its African colonies, slowly started to follow the British example of democratic reforms. A law of June 23, 1956, enabled the French government to establish in the African territories, territorial assemblies with the right to legislate in certain limited fields and to give the native populations some share in the exercise of executive power.

Independent Ethiopia also took its first step toward democracy. At the end of 1955 Emperor Haile Selassie granted his country a new constitution. It introduced for the first time in the history of this ancient nation the right to vote and provided for a lower house of parliament elected by universal suffrage. Following the British model of the 19th century, the constitution adopted the system of gradualness, to allow democracy to take real root in the popular mind. A codification of modern laws was being undertaken and the first elections were to be held within two years.

Democracy in Asia, 1956.—In Asia democracy had deep roots only in the Philippines and in the member states of the British commonwealth—India, Pakistan and Ceylon. Even in Turkey democracy was weakened in 1956 by an attempt of the ruling Democratic party to curtail the liberty of the press and the activities of the opposition parties. Elections in Burma showed the growing influence of the communists, especially among the students; as a result U Nu, the prime minister and leader of the Anti-Fascist People's Freedom league, withdrew from political life, deeply disappointed in the communist agitation. Elections held in Ceylon in April 1956 resulted in the defeat of the United National party which had been in power for 25 years and was strongly pro-western, by the People's United Front, whose leader, Solomon West Ridgway Diaz Bandaranaike, a wealthy Oxford-trained political leader, had shown neutralist inclinations. In Indonesia the elections at the end of 1955 resulted in the formation of a coalition government, from which the Communist party, although the third strongest among the four major parties, was excluded.

(See also COMMUNISM; EDUCATION; ELECTIONS, U.S.; EUROPEAN UNITY; GREAT BRITAIN; SOCIALISM; UNITED STATES.)

(H. Ko.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Defining Democracy* (1954); *Planning Our Foreign Policy* (Problems of the Middle East) (1955); *World Affairs Are Your Affairs* (1952).

Democratic Party: see POLITICAL PARTIES, U.S.

Denmark. A democratic monarchy of north central Europe, Denmark has an area of 16,577 sq.mi. Greenland (q.v.), an island of 840,000 sq.mi. in the North Atlantic ocean, is an integral part of the kingdom. Pop.: (1950 census) 4,281,275; (1954 est.) 4,387,967. Capital: Copenhagen (with chief suburbs, 1954 est.) 1,202,891. Other principal cities (1954 est.): Aarhus 118,888; Odense 104,344; Aalborg 81,954. Religion: Lutheran Christian. Ruler in 1956: King Frederick IX. Prime

minister: H. C. Hansen.

History.—A government commission established in Dec. 1955 produced a revealing report on the country's economic problems. Despite emphasis on full employment, increased investment and the checking of inflation, none of these goals had been achieved. Progress made during the early months of 1955 had come to a halt. In the years 1950–55 Denmark's total production had increased only 9%, compared with increases of 16% in England and Sweden, 17% in Norway, 21% in the Netherlands, 32% in Italy and 60% in west Germany. An unfortunate relationship between the costs of imports and the prices obtained for Danish agricultural exports was part of the trouble. Denmark blamed the United States for "dumping" butter in west Germany, ruining Denmark's market there and depressing butter prices elsewhere. Of more general significance was the uncontrolled spending in Denmark for both building and consumption goods.

Unrest expressed itself in the outbreak of a series of strikes in March 1956. First 30,000 metal workers walked out, then 4,000 seamen; the resultant lack of fuel and electric power seriously hampered production and communication. Then the printing trades struck, with total strikers numbering about 60,000–70,000. Employers threatened, but did not carry out, a lockout of about 200,000 employees. The official conciliator worked out a proposal for wage increases of 1½ cents per hour and various fringe benefits; the workers rejected this solution, and went back to work in mid-April only after the parliament passed legislation compelling them to do so. The seamen did not yield until April 27 and were forced to pay a fine of 1,000,000 kr. for their intransigence; Communist-inspired riots occurred in a few places.

Early in March a number of Danish officials visited Moscow, but as Prime Minister Hansen said on his return, "We have not sold one another our points of view." Progress was made in an agreement to co-ordinate rescue work in the Baltic and to facilitate indemnity claims concerned with the former Baltic republics. "Cultural co-operation" was pledged, and Russian archives were opened to Danish historians. A Russian request for a tanker was parried with the offer of two freighters.

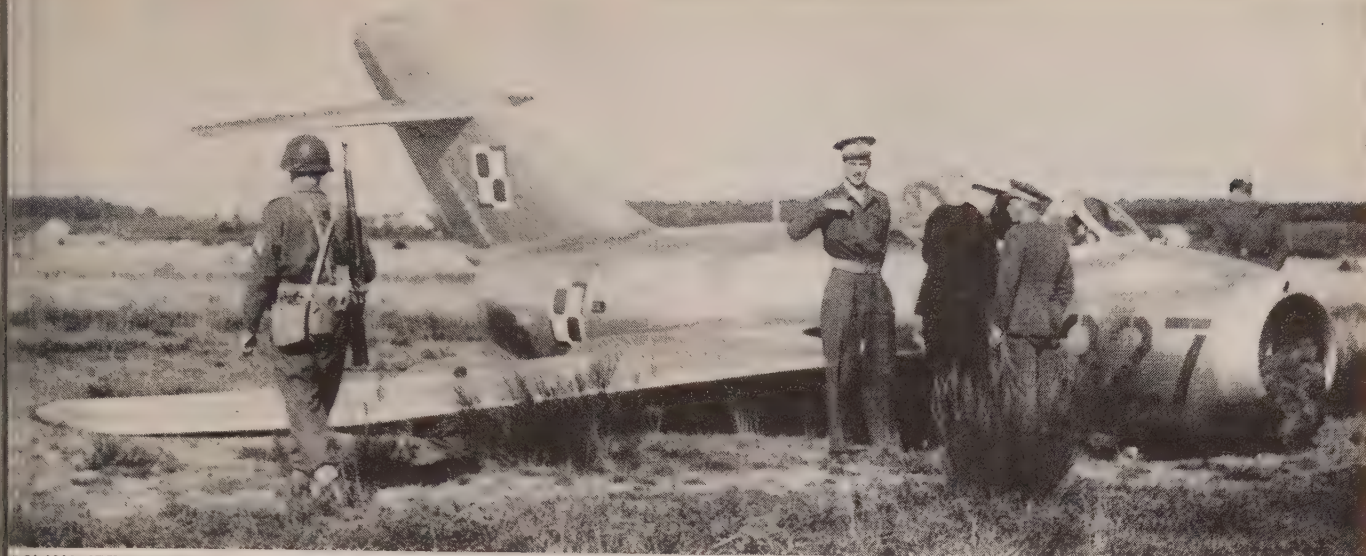
Denmark was much interested in research in the peaceful uses of atomic energy, and was granted \$200,000 by the Ford foundation for the promotion of such activity, primarily conducted through the institute headed by Niels Bohr.

In the field of Scandinavian co-operation, Denmark continued to press for action. The Nordic council met in Copenhagen in January, with the common Scandinavian market as one of the chief topics. Agreement was reached that about 45% of inter-Scandinavian trade was to be duty free, but 65%–70% was necessary if Denmark-Norway-Sweden was to qualify as a free trade area under G.A.T.T. (General Agreement on Tariffs and Trade).

The promoters of the riots of 1955 in Klaksvig in the Faeroe Islands were sentenced: harbour master Fischer-Heinesen and vice-chairman Joensen of the Klaksvig municipal council to six-months imprisonment and 31 others to lesser terms.

A unique clock was set in motion by King Frederick in the Copenhagen city hall on Dec. 15, 1955. Through 30 years watchmaker Jens Olsen had worked on the design, and when he died others carried through the construction in another 10 years. It was expected to deviate only two-fifths of a second in 300 years and to run without stopping for at least 1,000 years. In 11 connected works and on 10 dials the "world clock" showed, among other things, the days, weeks, months and years of both Julian and Gregorian calendars, and the movements of the planets and of sunrise and sunset.

In May the defense ministry was left vacant by the resignation of Rasmus Hansen, and Premier H. C. Hansen appointed



POLISH JET FIGHTER which landed on an uncompleted airstrip on Bornholm island, Denmark, Sept. 25, 1956, the third incident of its kind since 1953. The pilot was seeking political asylum in the west

Poul Hansen in his place.

(F. D. S.)

Education.—Schools (Dec. 1954): primary, middle and secondary 3,960, pupils 635,610 (of which 108,260 secondary), teachers 22,793; folk high, agricultural and domestic science schools (1954-55) 117, pupils 11,064; technical (1952) 581, pupils 96,407; teacher training schools (excluding domestic science, physical training and primary rural) 25, students 4,492. Institutions of higher education (1954) 10, of which 2 universities with 1,343 students.

Finance and Banking.—Monetary unit: krone, with an exchange rate of 4.907 to the U.S. dollar. Budget: (1953-54 actual) revenue 4,268,400,000 Kr., expenditure 5,143,600,000 Kr.; (1955-56 est.) revenue 4,895,800,000 Kr., expenditure 4,906,700,000 Kr. Internal debt (March 1954): 8,012,000,000 Kr.; external debt 1,566,800,000 Kr. Currency circulation: (Jan. 1955) 1,982,000,000 Kr.; (Jan. 1956) 1,984,000,000 Kr. Deposit money: (Jan. 1955) 5,171,000,000 Kr.; (Jan. 1956) 5,208,000,000 Kr. Gold and foreign exchange: (March 1955) 160,100,000 U.S. dollars; (March 1956) 188,000,000 U.S. dollars.

Foreign Trade.—(1955) Imports 8,142,000,000 Kr., exports 7,290,000,000 Kr. Main sources of imports: U.K. 25%; Germany 19%; other continental E.P.U. (European Payments Union countries) 34%; Latin America 2%; U.S. and Canada 8%. Main destinations of exports: U.K. 33%; Germany 18%; other continental E.P.U. 25%; U.S. and Canada 4%; Latin America 6%. Chief exports: bacon 16%; butter 12%.

Transport and Communications.—Roads (Jan. 1955): 57,490 km. Motor vehicles in use: passenger (1954) 193,300, commercial (Dec. 1954) 95,600. State railways (1954) 2,651 km.; private 2,039 km.; passenger-kilometres (1954) 3,313,154,000; freight, ton-kilometres (1954) 1,164,000,000. Shipping (July 1955): merchant vessels of 100 gross tons and over, 680; total tonnage 1,651,686. Air transport (1955): passenger-kilometres 296,580,000; freight, ton-kilometres 8,160,000. Telephones (Jan. 1955): 864,980. Licensed radio sets (1953) 1,320,000.

Agriculture.—Main crops (metric tons, 1955; 1954 in parentheses): wheat 248,000 (292,000); barley 2,197,000 (2,045,000); oats 870,000 (799,000); rye 194,000 (277,000); potatoes 1,442,000 (1,963,000); sugar beets 1,932,000 (1,694,000). Livestock (Sept. 1955): cattle 3,178,000; sheep 32,000; horses 308,000; pigs (April 1956) 4,587,000. Food production (metric tons, 1955): milk 5,136,000; butter 165,000; cheese 87,600; beef and veal 212,400; pork 512,400. Fish landings (1954) 352,500 metric tons (excluding Faroe Islands, 89,400 metric tons).

Industry.—Fuel and power (1955): lignite 804,000 metric tons; manufactured gas 90,000,000 cu.m.; electricity (excluding industrial generation) 3,396,000,000 kw.hr. Production (metric tons, 1954): superphosphates 454,689; glass containers 37,776; pig iron 39,551; cement (1955) 132,800. Index of production (1949=100): (January-March 1955) 124, (January-March 1956) 117. Merchant vessels launched (100 gross tons and over, 1955) 153,600 gross tons.

ENCYCLOPEDIA BRITANNICA FILMS.—Denmark (1955); Scandinavia—Norway, Sweden and Denmark (1950).

Dentistry. The effectiveness and safety of fluoridation in reducing tooth decay evolved conclusively from theory to scientific fact in 1956. Early in the year, the final reports of the ten-year field trials in Grand Rapids, Mich., Newburgh, N.Y., and Brantford, Ont., showed approximately a 60% reduction in tooth decay in children living in all three cities. The same results were reported after eight and a half years of fluoridation field trials in Evanston, Ill.

During 1956, the second and seventh largest cities of the U.S., Chicago, Ill., and Cleveland, O., initiated fluoridation programs.

As of Oct. 1, 1956, there were about 1,300 communities in 45 states with a total population of about 29,000,000 persons drinking fluoridated water. In addition, more than 3,000,000 persons were drinking water which naturally contained fluoride of 1.0 parts per 1,000,000 or more.

Interest in fluoridation also continued abroad. In addition to Canada, where a number of cities were employing it, fluoridation was reported to be in operation in at least one city in Brazil, Chile, Colombia, west Germany, Malaya, Netherlands, Japan, Sweden, United Kingdom, Belgium, Australia and New Zealand.

Expanded dental research programs were established as a result of a congressional appropriation of \$6,026,000 for the dental activities of the U.S. public health service. The major portion was earmarked for the activities of the National Institute of Dental Research, including nearly \$4,000,000 for research grants to schools and other nongovernmental agencies, fellowships and training grants. Congress also appropriated funds for the expansion and construction of research facilities in schools of dentistry and medicine.

Development of a panoramic X-ray machine, designed for use in mass surveys and examinations, was completed during the year. The machine, which rapidly takes a single X-ray picture of the entire dental arch, was developed by the national bureau of standards in co-operation with the U.S. air force. It was expected that the new technique would save much of the time required to take and process conventional X-rays, where up to 14 separate films were necessary to complete a full mouth survey.

In the new technique, the film is placed outside the patient's mouth and is exposed by passing a narrow beam of X-rays through the patient's head from the rear. An exposure time of 20 sec. is needed for each side of the arch. A complete panoramic X-ray of all the teeth is obtained on a single 5 x 10-in. film in 40 sec. While conventional X-rays fail to show pathological conditions lying outside the field covered by the small film, the single picture X-ray presents a comprehensive picture of the entire mouth. The panoramic X-ray machine records adequate detail to obtain a diagnosis of general mouth conditions; however, it is not designed to supplant the conventional X-ray machine in cases where extreme sharpness and detail are needed.

The establishment of a permanent dental health section in the World Health organization (WHO) was an indication of the trend toward increased interest in international dental activities. The WHO dental program, which covers more than 100 nations throughout the world, included a four-point plan for prevention, education, treatment and research.

The Fédération Dentaire Internationale, the recognized international organization for the dental profession, also continued to expand its activities. Representatives of the dental societies of 20 countries were present at the federation's May meeting in Zurich, Switz. One of the important resolutions passed at the 1956 session urged all member nations to take steps to combat extensive dentifrice advertising campaigns in operation throughout the world. The resolution pointed out that the advertising was based on "unsupported claims for the prevention of dental disease" and warned that the promotion of these dentifrices tended to mislead the public by minimizing the importance of accepted dental health practices. (H. T. DN.)

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Dermatology. By 1956, a new significance was being attached to the importance of a positive "Wassermann" test. A person was formerly thought to be infected with syphilis if his blood test was positive. During World War II evidence increased that such positive tests did not necessarily indicate the presence of syphilis, for many men in service had so-called "false positive" tests especially after being vaccinated for smallpox. Usually, these blood tests gave positive reactions for only a short period and became negative in time. More recently it had become apparent that there are both temporary and permanent false positive reactions. It was believed now that the presence of a chronic or permanent false positive blood test carries serious import, for it was noted that such a test might well be the first sign of a serious disease, particularly systemic lupus erythematosus. New tests were devised to determine, if possible, whether a positive reaction is due to syphilis or not. The *Treponema pallidum* Immobilization test which, when positive, indicates rather reliably the presence of syphilis, is both technically difficult and expensive to perform. In 1956 a newer test, the *Treponema pallidum* Complement Fixation test, was reported to be equally reliable, and it could be performed by any laboratory that performed the standard type tests.

Oxypsoalens are a group of drugs capable, in some cases, of repigmenting areas of skin from which pigment has been lost, as in the disease vitiligo. Recently it was reported that these drugs act also to reduce all activities of the sun's rays, thus in effect tending to prevent sunburn. In addition, the drugs potentiate tanning of the skin. For the latter reasons they were exploited as sun-tan pills, to be taken by mouth.

Itching has long been considered a form of pain. Now the suggestion was made that itching may be a primary sensation distinct from either pain or touch. There were indications that itching might be engendered by chemical stimuli from proteolytic enzymes in the skin, and different enzymes it appears, have different latent periods, different durations and even different intensities. Under experimental conditions, certain enzymes actually produced itching sensations but not pain. The precise mechanism of the action was still unknown but it was postulated that certain circumstances perhaps produced a synthesis or release of an active proteinase from cells in the skin. If verified, these results might well open an entirely new field of research to develop effective anti-itch remedies.

Sarcoidosis, a peculiar disease without a common name, long thought to be limited to the skin, is now recognized as a systemic

disease capable of affecting almost any structure of the body. The condition is not common or rare, it affects American Negroes more than whites, and usually runs a prolonged benign course—though malignant forms are encountered. The cause is not known. Many physicians consider it to be a form of tuberculosis; others have noted a resemblance to leprosy; and some consider it to be a disease "sui generis."

Recently an interesting epidemiological study of sarcoidosis in 350 U.S. servicemen in World War II revealed a significantly greater frequency among those born in the southeastern states, those residing in rural areas, and those residing in regions where there is fine sandy soil, like that in which hookworm is most prevalent. It was suggested that some organisms may find certain soils in the southeastern United States a natural medium, and that plant and animal life in the areas might be worth studying for possible causative relationship to sarcoidosis.

During the year tranquilizing drugs were much used for patients with skin diseases thought to be linked with emotional disturbances and those producing an uncontrollable urge to scratch. More often than not, the effects of the drugs were satisfactory, though inevitably some untoward cutaneous reactions from their use were reported.

There were reports also of untoward reactions from the use of saccharin (urticaria); from "wet strength" tissue papers; from self medications with vitamin A for acne (a young woman was reported as becoming bald and suffered from bone and joint pains, insomnia, swollen ankles, haemorrhages in the skin, aphthous lesions and frequency of urination); and peculiar granulomatous lesions that developed in the armpits from the use of certain type stick antiperspirants.

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Detroit. Detroit, Mich., seat of Wayne county, had an estimated 1956 population of more than 2,000,000 as compared with a 1950 federal census count of 1,849,568. Surrounding suburbs comprising the metropolitan area and lying in parts of four counties had a population approximately equal to that of the city proper.

As it was in several immediately preceding years, the trend in Detroit in 1956 was toward municipal rehabilitation. Its system of limited-access expressways continued to be extended. The Henry and Edsel Ford Memorial auditorium was completed and construction of the Convention and Exhibits building begun. The latter would accommodate the largest conventions. Both were elements in the river front development which had brought about the razing of many blocks of old structures.

Large-scale municipal parking facilities in the form of multi-deck garages, underground garages and surfaced lots were started, and in some instances completed, both downtown and in outlying shopping districts. Like the expressways, the parking program was required by the great extent to which Detroit is dependent upon private automobiles. With a land area of 139.6 sq. mi. its sole public transportation consists of city-owned bus lines.

Work was begun on a private housing development where blocks of slum hovels had been levelled, and a pilot rehabilitation program was carried on in a large section given mainly to older housing.

Preliminaries toward meeting berthing needs of larger and more numerous ocean-going vessels anticipated upon completion of the St. Lawrence seaway were undertaken, with policy calling for public facilities in addition to expansion of present private

hip terminals.

Planners also gave attention to the problem of "industrial tumors." Detroit is so completely surrounded by other incorporated communities that further annexations are all but impossible, and within the city limits virtually all land is occupied. With many of its factory structures growing obsolete, there has become apparent a need for industrial plant replacement which can be met only by clearing ground for it in present industrial areas of the city.

Detroit's government is nonpartisan and its officials are elected for four-year terms. The nine-member common council is elected at large. Its own courts for trial of criminal cases relieve the pocket of the state courts.

The school system is partly on the so-called 8-4 plan (elementary and high school) and partly 6-3-3 (elementary, intermediate and high). During 1956 the municipal university, Wayne, with an enrolment of about 17,000, was transferred to the state of Michigan as its third university. In terms of administration and financing the transfer would be conducted over a three-year period.

Detroit's 1956-57 fiscal assessed valuation was \$4,901,491,790; bonded debt \$310,620,703 and its municipal tax rate per \$1,000 of assessed valuation \$22.393; its school tax rate \$13.864.

(R. Ho.)

Diabetes. The blood sugar lowering effect of a sulfonamide was noted by Ruiz in 1930 in rabbits and in 1942 by Janbon in a case of typhoid fever. A. L. Loubatières and others of the French school found that, with oral or intravenous use of p-aminobenzolsulfonamid isopropyl thiodiazol (2254 IP) in animals, the sugar in the blood was lowered, but it was ineffective in the totally depancreatized animal. Subsequently in Germany while studying the antibacterial activity of BZ 55 (carbutamide-pan-aminobenzene-sulfonamide butyl urea) it was observed that certain patients would develop a lowering of the blood sugar and symptoms of an insulin reaction. Therefore, BZ 55 was given on a large scale by F. Bertram in his clinic, and his conclusions were substantiated to a remarkable degree. This drug in general acts best with diabetics over 45 years of age in whom the disease is of less than five to ten years' duration, who have not been treated at all or only for a part of the time with insulin and in whom it is considered probable that some of the beta cells of the islands of Langerhans are still producing insulin. In children and juveniles BZ 55 rarely is effective; in these cases it works presumably only when the disease is in an early stage with a remission. It seldom acts if the patients excrete more than 40 g. of sugar in 24 hours or require more than 30 units of insulin. Under all conditions, diet is fundamental for a successful treatment with BZ 55.

BZ 55 (carbutamide) was originally produced in Germany by Hoechring and Sons, but another drug in which the amino group is replaced by the methyl group in the benzene ring, thus eliminating an antibacterial effect, was manufactured by Farberwerk-Boechst. This is known as D860, tolbutamide or Orinase. These drugs were said to have been used by 70,000 patients in Germany. Contraindications for the use of BZ 55 and Orinase are known sensitivity to sulfonamides, infections, the presence of ketonidosis, surgery and pregnancy. They also should be avoided when complications in the liver or kidneys are suspected or when the patient is in an unstable condition so that the interpretation of results would be difficult.

Fewer complications were reported in Germany than in some other countries, where they had reached 10%. The commonest complications were skin rashes, occasionally accompanied by fever, headaches and rarely jaundice.

In 1956 these drugs were still in the experimental stage unlike

insulin. Presumably they act on the insulin-producing cells of the pancreas.

Prior to the discovery of insulin, diabetics lived on the average 6 years after onset of the disease, but in 1956 the span was 18 years. The enormity of the problem can be realized when it is considered that there were at least 2,000,000 diabetics in the U.S. in 1956. Those with onset under age 40 lived 25 years; those with onset between ages 40 and 59 lived 19 years; and those with onset at age 60 or more lived only 10 years. Up to 1914 the percentage of diabetics living more than 20 years was 1.8, but in 1956 it was 42. Of 1,072 diabetics the onset of whose disease took place in childhood and the duration of which had been 20 years or more, 82% were living, 16% had died and 2% were untraced. Of the 169 deaths, diabetic coma claimed 0.6%, infections 2.9%, tuberculosis 1.2% and cardiorenal-vascular disease 87.5%; of the last, 50.9% of deaths were attributed to disease of the kidneys.

The importance of sex in diabetes had become more and more evident because of greater interest in and investigation of the health of females and also because of the greater numbers who lived into the age zone when diabetes was most likely to have its onset. In 1948 in the United States the excess of diabetic females over males amounted to 70%. Female diabetics decidedly predominated in the age group from 45 years onward. Recently, D. A. Pyke added another cause. He found that the excess of women diabetics was confined to women who had borne children, and that it rose with increasing parity. In an analysis of 953 diabetics there was an approximately equal sex incidence below the age of 45, but a preponderance of women over 45. A woman who had borne five children appeared to have about three times as great a chance of developing diabetes as a woman who had borne none; on the other hand, parity did not lead to the earlier appearance of diabetes. Pyke found that this effect of parity could not be attributed merely to a slightly greater tendency of multiparae to become fat, since the preponderance of women diabetics were of normal weight or underweight. Likewise, he excluded the menopause as an aetiological factor because an excess of women diabetics would be expected in all parity groups and this was not the case. The age at diagnosis was similar for all degrees of parity.

The availability of a simple method of determining the percentage of sugar in the blood was of major importance in the discovery of insulin. The introduction of two paper tests, Tes-Tape and Clinistix, for the detection of sugar in the urine was of much less importance, but these tests were so simple that they stimulated patients to keep far better control of their disease. The Tes-Tape and Clinistix tests depended upon paper impregnated with glucose oxidase and O-tolidine and a second enzyme, a vegetable peroxidase which produces oxygen when in contact with beta glucose. Tes-Tape incorporates a dye which reacts by a colour change from blue to yellow in a partly quantitative way, while Clinistix depends upon orthocolidine which if oxidized is a deep blue. This enzyme system was more sensitive than methods formerly generally employed and was a specific for glucose.

Confusion sometimes occurred in the minds of patients and even doctors in the interpretation of the tests, because the colour changes showing the presence or absence of sugar were exactly opposite to those dependent upon Benedict solution. These tests were, however, harbingers of what the biochemists would some time provide as a ready method for the determination of sugar in the blood.

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(in press); D. A. Pyke, "Parity and the Incidence of Diabetes," *Lancet* 1:818-821 (June 2, 1956); J. A. Hunt, C. H. Gray and D. E. Thorogood, "Enzyme Tests for the Detection of Glucose," *Brit. M. J.*, 2:586 (Sept. 8, 1956). (E. P. Jo).

Diamonds. World production of diamonds increased 5.5% in 1955 over 1954. Table I, based on a U.S. bureau of mines compilation, gives the details of the industry. Thus output in all principal diamond producing areas, except South Africa, increased in 1955. The decrease there resulted from the closing of two of the mines of the De Beers group of Kimberley and curtailment of output at three others. The proportion of industrial stones in the total caratage was over 83%.

Table I.—World Production of Diamonds
(Thousands of carats)

	1950	1951	1952	1953	1954	1955	
						Total	Industrial
Angola . . .	539	734	743	729	722	743	304
Belgian Congo .	10,147	10,565	11,609	12,580	12,619	13,041	12,480
French Africa .	338	249	299	320	369	455	300
Gold Coast . .	950*	1,753	2,190	2,167	2,135	2,277	1,770
Sierra Leone .	655	477	452	473	399	930	540
South Africa .	1,748	2,256	2,376	2,815	2,858	2,587	1,665
S.W. Africa . .	488	503	541	617	684	813	80
Tanganyika . .	195	108	143	171	326	326	150
Brazil	200*	200*	200*	200*	200*	200*	100*
Others	40*	111*	142*	128*	128*	178*	111*
Total	15,300	16,956	18,695	20,200	20,440	21,550	17,500

*Estimated.

Table II.—U.S. Diamond Imports
(Carats)

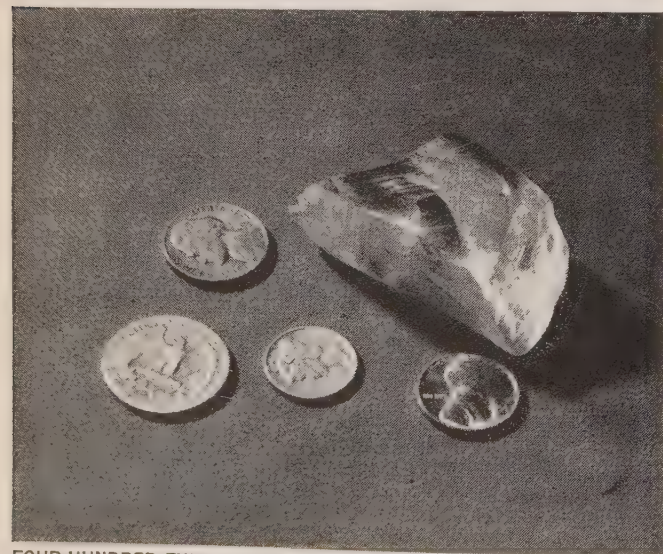
	Rough	Cut	Industrial	Total
1948	909,871	388,499	10,648,250	11,946,620
1949	633,731	335,487	6,381,476	7,350,694
1950	673,699	492,741	11,201,045	12,367,485
1951	654,235	480,602	12,287,407	13,422,244
1952	709,043	438,546	13,522,676	14,670,265
1953*	730,350	444,062	12,768,595	13,943,007
1954	887,702*	594,772	13,807,344	15,289,818*
1955†	1,064,932	707,859	14,944,635	16,717,426

*Revised. †Preliminary.

The diamond sales syndicate reported sales in 1955 as £74,288,695 (gem stones £50,253,946; industrials £24,034,749) compared with £62,153,125 in 1954, an increase of 19%.

United States.—In 1955, the dollar value of diamond imports rose from \$170,201,321 in 1954 to \$217,184,643. The U.S. imports of industrials in 1955 were equal to 85% of the world output.

The syndicate reported that sales in the first nine months of 1956, in dollar values, totalled \$153,600,000 (gems, \$103,000,000; industrials, \$50,600,000). It also reported that diamond sales had been bolstered by the U.S. government defense



FOUR-HUNDRED TWENTY-SIX CARAT DIAMOND purchased by a New York city dealer in Jan. 1956. Cutting the stone into a single gem would give it an estimated value of \$2,500,000 but would pose the problem of finding a buyer wealthy enough to purchase the jewel

stockpiling, and when this ceased new outlets would have to be found. (F. E. H.; B. B. M.)

Diplomatic Services: see AMBASSADORS AND ENVOYS.
Direct Mail Advertising: see ADVERTISING.
Disabled American Veterans: see VETERANS' ORGANIZATIONS, U.S.
Disarmament: see UNITED NATIONS.

Disasters. The loss of life and property in disasters during the period Nov. 1, 1955, to Oct. 31, 1956, include the following. (See also articles on ACCIDENTS; FIRES AND FIRE LOSSES; FLOODS AND FLOOD CONTROL; METEOROLOGY; SEISMOLOGY.)

Aviation

- Nov. 1 Near Longmont, Colo. Commercial air liner crashed following time-bomb explosion, killing 44 persons.
- Nov. 8 Near Taegu, Kor. South Korean training plane struck school; 1 children and a student pilot were killed, 12 children injured.
- Nov. 17 Near Las Vegas, Nev. Crash of U.S. air force plane killed 1 persons.
- Nov. 18 Near Seattle, Wash. Commercial air liner crash killed 28 of 70 persons aboard.
- Nov. 20 Iwo Jima, Bonin Is. U.S. air force plane crashed during take-off; 10 of 11 persons aboard were killed.
- Nov. 29 Fairbanks, Alsk. U.S. air force plane crashed in residential area; 14 persons were killed, 8 injured.
- Dec. 21 Jacksonville, Fla. Commercial air liner crash killed 17 persons.
- Jan. 18 Near Torsky, Levoca, Czech. Air liner crashed in Tatra mountains; 22 persons were killed, 4 injured.
- Feb. 17 Near Niles, Calif. U.S. marine corps air transport struck mountain peak; 40 persons were killed.
- Feb. 18 Near Valletta, Malta. Scottish air liner crashed, killing 5 persons.
- Feb. 20 Near Cairo, Eg. French air liner crashed in desert; 52 of 60 persons aboard perished.
- Feb. 24 Near Aleppo, Syr. Syrian air liner exploded in mid-air; 19 persons were killed.
- Feb. 27 Dayton, O. U.S. air force plane crash and explosion killed 1 persons.
- March 3 North Atlantic ocean. U.S. air force plane with 17 persons crashed about 250 mi. from Iceland; there were no survivors.
- March 12 Placenta bay. U.S. air force plane crashed and exploded a short distance south of Newfoundland; all 6 persons aboard were killed.
- March 31 Near Nakhon Ratchasima, Thai. Thai air force plane crashed killed 19 persons.
- April 1 Near Pittsburgh, Pa. Air liner crashed and burned; 22 persons were killed, 14 injured.
- April 2 Puget sound. Air liner crashed and sank near Seattle, Wash.; 38 persons aboard were killed.
- May 15 Orleans, Que., Can. Canadian air force jet plane crashed into Roman Catholic rest home; 15 persons, including two crew members, were killed; the home was totally destroyed by fire.
- May 15 Katmandu, Nep. Indian air liner crashed into canyon killing a 21 persons aboard.
- May 15 Jeffersonville, Ind. Eight persons died when private plane crashed.
- May 24 Izabal province, Guat. Guatemalan air liner crashed into mountain peak, killing 30 of 31 persons aboard.
- June 9 Minneapolis, Minn. U.S. navy jet plane crashed and burned housing area; the pilot and 8 other persons were killed, 5 injured.
- June 20 Atlantic ocean. Venezuelan air liner crashed in flames off Asbury Park, N. J.; all 74 persons aboard perished.
- June 24 Near Kano, Nig. Thirty-two of 45 persons aboard British air liner died in crash following take-off.
- June 30 Northern Arizona. Two commercial air liners collided in flight over the Grand Canyon during a storm; all 128 persons aboard planes were killed. It was termed the worst commercial air disaster in aviation history.
- July 13 Near Fort Dix, N.J. U.S. air force transport plane crashed in rain; 46 of 66 persons aboard were killed, 20 injured.
- July 16 Near Rio Cuarto, Arg. All 18 persons aboard died in crash of Argentine air liner.
- Aug. 22 East China sea. U.S. navy patrol bomber with 16 persons aboard was admittedly shot down by Red Chinese guns about 160 mi. north of Formosa and about 35 mi. off the China coast; there were no survivors.
- Aug. 29 Cold Bay, Alsk. Crash of Canadian air liner killed 15 of 20 persons aboard.
- Aug. 31 Near Anchorage, Alsk. Crash of U.S. air force weather plane killed all 11 persons aboard.
- Sept. 10 Sea of Japan. U.S. air force weather plane lost in typhoon near Niigata, Jap.; all 16 persons aboard were presumed dead.
- Sept. 24 Near Buena Vista, Colo. U.S. air force plane crashed into mountain, killing all 12 persons aboard.
- Oct. 11 Atlantic ocean. U.S. air force plane with 59 persons aboard, a military personnel, disappeared on flight between Lakenheath Eng., and the Azores.

Fires and Explosions

- Nov. 1 Near Akahira, Hokkaido, Jap. In mine explosion, 60 coal miners were killed, 6 injured.
- Nov. 9 Near Fukouka, Jap. Explosion in coal mine killed 11 persons, injured 18.
- Dec. 1 Piacenza, It. In explosion of World War II bombs 9 persons were killed.
- Dec. 7 Frankfurt-on-Main, Ger. Gas explosion in apartment building killed 27 persons and injured 7.
- Jan. 9 Near Amos, Que. Fire in home killed 8 members of one family.
- Jan. 29 Baltimore, Md. Fire in hall terrified crowd; 11 persons were killed, 227 injured in crush.
- Feb. 13 Gerze, Tur. Fire in office building killed 20 persons.
- March 2 Motize, Moz. Explosion in coal mine killed 34 persons.
- March 7 Joban City, Jap. Gas explosion in mine killed 14 persons, injured 7.
- March 8 Oxford, Pa. Fire in home killed 11 persons, all members of same family.
- April 4 New York, N.Y. Collapse of burning factory killed 6 firemen, injured 8.
- April 15 Prachuab Khiri Khan, Thai. Bomb accidentally dropped from Thai air force plane killed 30 persons, injured 29.
- April 26 Near Sylvania, O. Seven children, all members of one family, died when house burned.
- April 27 Pulaski, Va. Gas heater in 3-story building exploded, killing 10 persons.
- May 17 Near Takoradi, Gold Coast. Explosion in ammunition dump killed a reported 25 soldiers.
- July 2 Madrid, Sp. A reported 15 persons were killed and more than 40 injured when apartment building collapsed after a fire.
- July 15 New York, N.Y. Conflagration of 25-hr. duration in abandoned Wanamaker store building injured 208 firemen.
- July 29 Near Dumas, Tex. Explosion and burning of 4 oil tanks killed 19 persons, injured 32.
- July 30 Puxico, Mo. Fire in nursing home killed 12 persons.
- Aug. 7 Cali, Col. Seven military trucks laden with dynamite and gasoline exploded in midcity; a reported 1,200 persons were killed, more than 2,000 injured; 8 city blocks were destroyed and property damage was set at more than \$40,000,000.
- Aug. 8 Marcincelle, Belg. Fire in coal mine killed 262 persons. It was termed the worst mining disaster in Belgium history.
- Aug. 13 Monticello, Utah. Explosion, caused by leakage of natural gas in restaurant, killed a reported 15 persons, injured 9.
- Aug. 27 Koenigshuette, Pol. Fire and escaping gas killed a reported 29 coal miners.
- Sept. 3 Johannesburg, U. of S.Af. Dynamite explosion in gold mine killed 11 persons.
- Oct. 8 Near Middelburg, U. of S.Af. Gas explosion in coal mine killed 11 persons.
- Oct. 18 Herrin, Ill. Explosion of propane gas killed 8 persons, injured 4 others.

Marine

- Nov. 6 Off Fiji Islands. Launch, apparently struck by ship, found drifting in South seas; 25 persons were missing and presumed dead.
- Nov. 11 Pacific ocean. U.S. navy bomber crashed into destroyer "U.S.S. Hopewell" off Southern California coast killing 5 sailors, injuring 5 others.
- Dec. 31 Near Nandabi, Ken. Launch capsized in Lake Victoria during storm; 24 persons perished.
- Jan. 12 Samchonpo, S. Kor. Estimated 71 persons perished when ship "Taishin-Ho" burned at dock.
- Jan. 18 Lake Charles, La. Oil tanker exploded and burned in Calcasieu river; 4 persons were killed, 8 injured and 14 missing and presumed dead.
- Feb. 12 Near Mansoura, Eg. Ferryboat capsized in Nile river; 22 persons were killed.
- March 1 Near Alesund, Nor. Fishing boat capsized; 19 of 20 persons aboard were killed.
- March 16 Off Bajo Rapel, Chile. Fishing boat with 16 persons aboard foundered; 2 persons were killed, 14 missing and presumed dead.
- April 7 Badagri, Nig. Motor launch sank outside harbour, killing 28 persons.
- April 8 Parris Island, S.C. During military manoeuvres in swamp, 6 U.S. marines drowned.
- April 20 Off Shikoku Island, Jap. Ferryboat capsized; 16 persons were killed.
- May 13 Java sea. Overloaded launch capsized off Tegal, Java; 73 persons drowned.
- May 30 Rio de Janeiro, Braz. Ship and barge collided killing 10 persons.
- June 2 Bay of Bengal. Coastal steamer capsized between Chittagong, E. Pak., and Sandwip Island during monsoon; a reported 199 of 206 persons aboard were drowned.
- July 12 Chenab river, Pak. Boat sank about 80 mi. N.W. of Lahore; 95 persons were reportedly drowned.
- July 25 Atlantic ocean. Two trans-Atlantic liners, the Italian "Andrea Doria" and the Swedish "Stockholm," collided about 60 mi. south of Nantucket, Mass. The "Andrea Doria" sank but the "Stockholm" made port under her own power. Of 1,709 persons aboard both ships 50 were killed.
- July 28 Near Kuopio, Fin. Bus rolled off ferryboat and sank; 15 persons were drowned.
- Aug. 22 Near Baghazar, India. Ferryboat capsized in flooded Ganges river; 14 persons perished.
- Sept. 15 Near Lofoten Islands, Nor. U.S. freighter "Pelagia" sank in storm off Bodo, Nor.; 32 of 37 persons aboard died.
- Oct. 4 Off Ijmuiden, Neth. Polish fishing boat "Cyranka" sank; 10 trapped persons died.
- Oct. 31 Off Ishinomaki, Jap. Fishing boat "Hyohei Maru" capsized during storm; 38 of 45 crew members perished.

Miscellaneous

- Nov. 5 Paris, Fr. Faulty stove flues, supposedly clogged by heavy fog, asphyxiated a reported 15 persons.
- Nov. 17 Istanbul, Tur. Apartment house collapse killed a reported 15 persons.
- Dec. 25 Tampico, Mex. Panic in theatre caused deaths of 13 persons.
- Jan. 1 Niigata, Jap. Wall collapsed at shrine during New Year's festivities; 124 persons were killed.
- Feb. 13 Rio de Janeiro, Braz. Two-day pre-Lenten festivities left 13 persons dead, 437 injured.
- Feb. 19 La Paz, Bol. During Lenten season activities 31 persons fell into a sewer and were killed.
- Feb. 22 Kosti, Sudan. Imprisoned in a small jail, 194 farmers were suffocated and 8 injured.
- March 17 Kafr Saqr, Eg. Balcony in theatre collapsed; 12 persons were killed, 50 injured.
- March 23 Rawalpindi, Pak. Crowd en route to celebrate Pakistan's Republic day stampeded on bridge; 35 persons were killed, more than 60 injured.
- April 21 Granada, Sp. Falling of cavern roof killed 20 persons.
- June 8 Madrid, Sp. Floor collapsed during wedding dance; 17 persons were killed, 30 injured.
- June 12 Brooklyn, N.Y. Six children were killed when sand bank in which they were playing caved in.
- Aug. 6 Genova, Col. Ferris wheel collapsed killing 6 persons, injuring 30.
- Oct. 22 Karachi, Pak. A reported 48 workers were killed, 28 injured when concrete girder fell on them.

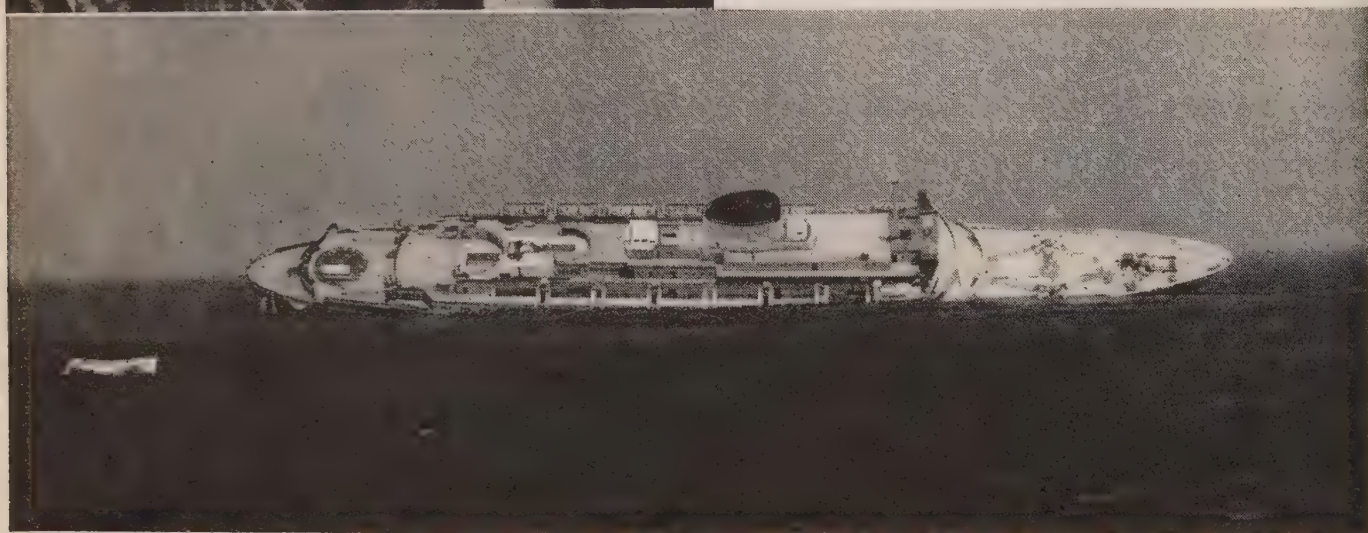
Natural

- Nov. 30 Mindanao-Visayan area, Phil. A reported 93 persons died in rainstorms.
- Dec. 2 Madras, India. Rainstorm and resultant 3-day floods, killed a reported 120 persons.
- Dec. 18 Tripoli area, Leb. Floods killed a reported 140 persons; 300 were missing and presumed dead.
- Dec. 27 Northern California-Oregon area. Nine-day rains and resulting floods killed a reported 74 persons, and caused property damage estimated at more than \$150,000,000. Hardest hit was Yuba City (Calif.) area.
- Jan. 10 Florida. Storm and low temperatures caused more than \$10,000,000 damage to crops.
- Feb. 4 Texas. Snowstorm swept entire state and killed a reported 18 persons.
- Feb. 9 Toyama, Jap. Avalanche killed 40 persons.
- Feb. 25 Illinois, Missouri, Indiana. Tornado killed 6 persons in Illinois, injured many others and caused property damage estimated at more than \$3,000,000.
- Feb. 26 Europe. Four-week intense cold wave, which swept over entire continent, killed a reported 907 persons and caused crop damage estimated at more than \$2,000,000,000.
- March 2 Near Seoul, Kor. Snow avalanche engulfed South Korean army barracks; 79 persons were killed, 36 injured and 24 missing.
- March 2 Santos, Braz. Cloudburst and resultant landslide killed 30 persons.
- March 16 Southern Lebanon. Series of earthquakes killed 145 persons, injured more than 200.
- March 20 Northeastern U.S. Four-day snowstorm extending northward from West Virginia to Maine killed a reported 162 persons and caused property damage of more than \$150,000,000.
- March 25 Santos, Braz. Heavy rains followed by landslide caused deaths of 36 persons.
- April 2-3 Midwestern-Southern U.S. Tornadoes killed 45 persons, injured 375 and caused property damage in 13 states estimated at more than \$15,000,000.
- April 11 Nampula-Niassa districts, Port. E.Af. Cyclone killed 107 persons.
- April 15 Near Birmingham, Ala. Tornado killed 22 persons, injured more than 800.
- May 12 Michigan-Ohio. Heavy wind, rainstorms and tornadoes killed 10 persons, injured more than 135; hardest hit was Cleveland, O., area.
- June 10-17 Kabul, Afg. A reported 2,000 casualties, 100 reported dead in week-long period of earthquakes.
- July 6 Central Philippine Islands. Tropical storm killed a reported 39 persons; 11 others missing and presumed dead.
- July 9 Thera, Gr. Earthquake, tidal wave and volcanic eruption killed 48 persons, injured 92.
- July 21 Kutch area, India. Earthquake killed 113 persons, injured 219; city of Anjar devastated.
- July 23-24 Kashan and Isfahan area, Iran. Floods killed a reported 450 persons and caused property damage estimated at \$60,000,000.
- July 26 Kandahar area, Afg. Floods caused by heavy rains killed a reported 51 persons.
- Aug. 2 Hangchow, China. Hurricane killed a reported 83 persons, injured 300.
- Aug. 4-5 Southwestern Pennsylvania. Floods following violent rainstorms killed 15 persons.
- Aug. 1-7 Chekiang, Hopeh and Honan provinces, China. Floods following typhoon "Wanda" caused deaths of a reported 2,161 persons, injured thousands more.
- Aug. 17-18 Northern Japan and Okinawa. Typhoon "Babs" killed 30 persons, left 16 others missing, injured 168.
- Aug. 22 West Pakistan. Flood in villages resulted in deaths of at least 70 persons, with hundreds missing.
- Aug. 22-23 Adjejan province, Tur. Flash floods caused by heavy rains killed 138 persons.
- Sept. 10 Okinawa, Japan, S. Korea and Philippine Is. Typhoon "Emma" killed a reported 55 persons and caused property damage estimated at more than \$2,000,000.



Above: SERIOUSLY INJURED passengers being comforted by relatives and other persons after interurban train overturned in Los Angeles, Calif., on Jan. 22, 1956

Above, left: WEARY SURVIVORS of collision between the passenger ships "Andrea Doria" and "Stockholm" on July 25, 1956. Below is the "Andrea Doria," listing to starboard shortly before sinking about 60 mi. from Nantucket, Mass., at 10:15 a.m., July 26



DISASTERS

Left: CHARRED GROUND in lower part of photograph marks remains of one of two airliners that collided in flight over the Grand Canyon in Arizona on June 30, 1956

Below: BELGIAN SOLDIERS, called to emergency duty, waiting for bodies to be carried up from coal mine disaster at Marcinelle. Short-circuited cable started fire 3,000 ft. below surface Aug. 8, 1956



Natural—Continued

- Sept. 17 Nemours, Alg. Cyclone killed at least 21 persons, injured 40.
 Sept. 26—Okinawa-Japan area. Typhoon "Harriet" killed a reported 23 persons.
 Sept. 27 Near Anasol, India. Flood in coal mine killed 28 workers.
 Sept. 30 Darbhanga, N. Bihar, India. Flash floods along Gandak river the previous week killed a reported 100 persons.
 Oct. 11 Near Manizales, Col. Twenty truck drivers died when landslides buried trucks.
 Oct. 14 Near New Delhi, India. Floods on Jumna river caused deaths of a reported 50 persons and property damage estimated at more than \$30,000,000.
 Oct. 20 Near Bampa, Garhwal, India. Avalanches killed 27 persons.
 Oct. 30 Honshu, Jap. Rainstorms caused deaths of 44 persons.

Railway

- Nov. 20 Near Didcot, Eng. Derailment of train killed 10 persons, injured 99.
 Dec. 2 Barnes, Eng. Commuter train struck stopped freight train; 13 persons were killed, 50 injured.
 Jan. 13 Near Kopparberg, Swed. Collision of rail bus and ore train killed 20 persons.
 Jan. 22 Los Angeles, Calif. Passenger train overturned after jumping track; 30 persons were killed, estimated 150 injured.
 Feb. 14 Near Santiago, Chile. Two trains collided; 21 persons were killed, 114 injured.
 Feb. 23 Near Odenton, Md. Broken axle caused train to jump track; 6 persons were killed, more than 100 injured.
 Feb. 25 Bornitz, E. Ger. Collision of two trains killed 32 persons, injured 40.
 Feb. 28 Near Swampscott, Mass. Train crashed into rear of another stopped at station; 13 persons were killed, 100 injured.
 Mar. 1 Near Ixaca, Mex. Train wreck caused deaths of 15 persons, injured 61.
 Sept. 2 Near Mahbubnagar, Hyderabad, India. At least 121 persons were killed when bridge collapsed and caused train section to drop into flooded stream.
 Sept. 5 Springer, N.M. Switching error by worker caused collision of 2 trains; 20 persons were killed, 10 injured.
 Oct. 15 Near Tsu, Jap. Collision of two trains caused deaths of 36 persons, injured 36.

Traffic

- Dec. 23—U.S. Deaths in auto accidents over 4-day Christmas weekend totalled 609 persons; a record.
 Dec. 26 United States. Traffic death toll over 3-day New Year weekend numbered 364 persons.
 Jan. 2 Near La Paz, Bol. Workers' truck crashed on mountain road killing 19 persons, injuring 14.
 Jan. 4 Near Karachi, Pak. Thirty-one of 51 persons aboard drowned when bus was swept away by rain-swollen river.
 Jan. 5 U.S. Deaths attributed to traffic mishaps over 30-hr. Independence day period totalled 137 persons.
 Aug. 5 Near Silay, Philippine Is. Collision of two buses killed 20 persons, injured 27.
 Sept. 4 U.S. Traffic deaths over Labor day weekend, as reported by the *Associated Press*, numbered 435 persons.
 Oct. 4 Near Virden, Man., Can. Head-on collision of two automobiles killed 10 persons, injured one.
 Oct. 25 Sigourney, Ia. Train-auto collision killed 8 car passengers, injured one.

Disciples of Christ.

Total membership of the Disciples of Christ in the United States and Canada in 1956 was 1,921,000; the world membership was 2,050,000; net increase in membership for the year was 30,321; local congregations in the world numbered 8,940; in the United States and Canada, 8,059. The total world number of ministers was 6,680. In the United States, Missouri had the largest number of local congregations and Indiana the largest membership. Total contributions for the United States and Canada were \$80,400,000. Missionary and benevolent giving exceeded \$25,000,000. Unified Promotion, the central receiving agency for missionary funds, raised \$4,238,156.21 during 1956. This represented a gain of 97.31% during the past five years. The 1956 Assembly of the International Convention of Disciples of Christ was held in Des Moines, Ia., Sept. 28-Oct. 3. The registration of 9,641 was the largest in history. The theme of this convention was "Spokesmen for God," highlighting the Year of the Ministry," which was the 1956 annual emphasis of the long-range program now in effect among Disciples of Christ. The program recognized the shortage of qualified ministers, and special effort was being made to recruit, educate and sustain the local ministry. Actions taken at the Des Moines assembly included a revision

of the pension plan to provide more liberal benefits to its members; establishment of new congregations, with special attention to the needs in New York city; emphasis on the urgency of interracial membership in local congregations; encouragement of continuance of fraternal visits between churchmen of the United States and the U.S.S.R.; an appeal for the extension of the refugee program; urging of more stringent laws for adoption of homeless children; and authorization of negotiations with other religious bodies in the formation of the United Church.

Missionary work during the year was conducted in 11 fields outside the United States: South Africa, Argentina, India, Jamaica, Japan, Mexico, Paraguay, the Philippines, Puerto Rico, Thailand and the Belgian Congo; 235 missionaries and 2,019 national leaders were serving under the United Christian Missionary society. Baptisms in overseas missions numbered 6,462. The membership of mission churches was 111,663, with a net gain in membership of 1,690.

The pension fund of Disciples of Christ reported a total active membership of 4,660 with 1,203 beneficiaries. This fund had total assets of \$21,166,186.07.

The National Benevolent Association of the Christian Church was in process of reorganization. There were 15 benevolent homes served by this organization, with an annual budget of \$1,500,000.

The Disciples of Christ are active members of the World Council of Churches and the National Council of the Churches of Christ in the U.S.A. Christian unity is their major objective.

The 1957 Assembly of the International Convention of Christian Churches (Disciples of Christ) was to be held in Cleveland, O., Oct. 11-16.

(See also CHURCH MEMBERSHIP.)

(G. M. CK.)

Displaced Persons: see REFUGEES.

District of Columbia: see WASHINGTON, D.C.

Divorce: see MARRIAGE AND DIVORCE.

Dog Shows: see SHOWS.

Dominica: see WINDWARD ISLANDS.

Dominican Republic. The eastern two-thirds of the island of Hispaniola is occupied by the Dominican Republic. Area: 18,682 sq.mi.; pop.: (1950 census) 2,135,872, (1956 est.) 2,463,000. The western one-third of the island comprises the republic of Haiti. The capital of the Dominican Republic is Ciudad Trujillo (known from the beginning of the 16th until the second quarter of the 20th century as Santo Domingo, whence the name of the nation); it has a population in excess of 200,000 (1953 est.). The 1950 census gave the largest cities as follows: Barahona 14,654; Ciudad Trujillo 181,553; La Romana 14,074; La Vega 14,200; Puerto Plata 14,843; San Francisco de Macoris 16,083; San Pedro de Macoris 19,876; and Santiago 56,558. The president in 1956 was Gen. Hector B. Trujillo y Molina.

History.—International relations were not seriously disturbed by some minor controversies with Cuba. The disappearance of a Spanish republican refugee named J. Galindez from his usual circle of activity in New York city, on the eve of the publication of a book adverse to the controlling regime in the Dominican Republic, where Galindez had once lived while working for that government, was the occasion of a campaign of charges in the United States against President Trujillo and his brother, the former president, Gen. Rafael Trujillo.

The international fair early in 1956, which cost the government more than \$30,000,000, was a substantial success, not only promoting a tourist influx, but bringing about also some stimulation of imports of manufactured goods. The establishment of a free zone was proposed as a proper use of the grounds and

buildings of the fair, and was under consideration late in the year. The value of exports, however, dropped in 1956, as in the preceding year, but there were slight increases in the volume of sugar, cacao and coffee sold abroad. Prices of consumers' goods changed very little in 1956. Budget receipts in 1956 were expected to exceed \$122,000,000, and expenditures to amount to \$120,000,000; but as the year progressed it became evident that outgo would exceed \$130,000,000, and income might attain that figure.

The investment of capital in the development of mineral resources proceeded rapidly during 1956. The mechanization of the gypsum mines promised an increase in the exportation of this product in 1957. The bauxite mines of the Aluminum company began operation at the end of 1956. The shipyard known as Astilleros Dominicanos Gibbs was pushed to completion, and was expected to receive its first repair jobs early in 1957.

European immigration continued at the same rate as in 1955; approximately 6,000 settlers (chiefly from Spain) entered the country during the two years. (C. E. Mc.)

Education.—In 1954 there were 2,641 schools (including 1,250 emergency schools), all of which were maintained by the state except 112 semiofficial (state-aided) and 169 private schools. The total number of pupils enrolled was 246,734. There were also 3,568 centres for combating illiteracy with 78,709 students enrolled. The University of Santo Domingo had 2,560 students. According to the 1950 census, 56.7% of those 10 years of age and over were illiterate.

Finance.—The monetary unit is the peso, officially pegged at par with the U.S. dollar. The 1956 budget estimated revenue at \$122,729,500 and expenditure at \$119,972,890. Revenue in 1955 was \$129,680,682. There was no public debt. Currency in circulation (June 30, 1956) totalled \$40,370,000; demand deposits, \$39,000,000. The U.S. department of commerce estimated U.S. direct private investments in 1955 at \$134,000,000. The cost-of-living index (Ciudad Trujillo) stood at 99 in June 1956 (1953=100). The gross national product at market prices in 1955 totalled \$527,700,000.

Trade and Communications.—Exports in 1955 totalled \$114,849,773; imports were \$99,278,688. Leading exports were sugar (36%), coffee (25%), cacao (15%), chocolate (6%) and tobacco (4%). Leading customers were the U.S. (53%), the United Kingdom (21%), the Netherlands (5%), Belgium (3%) and Puerto Rico (3%); leading suppliers, the U.S. (66%), the Netherlands Antilles (6%), Germany (4%), Canada (4%) and the U.K. (3%).

In 1951 there were 152 mi. of public railway, all owned and operated by the government, and 748 mi. of industrial railway, operated mainly by the sugar companies. Road mileage in 1950 was placed at 1,966, of which 694 mi. were classified as first-class all-weather, 1,027 secondary and 245 third-class. On Jan. 1, 1955, there were 11,308 motor vehicles, including 5,794 automobiles, 5,034 trucks and 480 buses. Telephones (Jan. 1, 1955) numbered 8,900, of which 85.6% were automatic.

Agriculture.—In the 1955-56 season 662,000 metric tons of sugar were produced; in 1955, 574,500 tons were exported. Production of other important crops in 1955-56 (preliminary) included coffee 595,000 bags of 132 lb. each (exports 1955: 408,000 bags); cacao 60,186,000 lb.; rice 220,000,000 lb.; tobacco (1955) 45,532,000 lb. In 1953 there were 857,000 cattle, 888,000 pigs, 125,000 horses and 121,000 mules and asses.

Manufactures.—In 1954 there were 3,416 industrial establishments with capital of \$166,567,172, 66,299 employees and sales amounting to \$162,516,994. Important products included sugar, cotton textiles, cement, beer, edible oils and chocolate. Installed electric energy capacity (Dec. 31, 1955) was estimated at 60,000 kw. (J. W. Mw.)

Donations and Bequests. Philanthropy in the United States apparently reached a record high in dollar volume in 1956. While official statistics of giving, recorded in both individual and corporate income tax returns, were not available beyond 1953, preliminary estimates indicated that total giving in the United States in 1956 considerably exceeded \$6,000,000,000. For 1953, the internal revenue service reports showed contributions by business and individuals estimated at \$5,275,000,000.

A record of benefactions of \$100,000 and over, announced in ten large urban areas (New York, N.Y.; Baltimore, Md.; Boston, Mass.; Chicago, Ill.; Houston, Tex.; Los Angeles, Calif.; Philadelphia, Pa.; Pittsburgh, Pa.; St. Louis, Mo.; and Washington, D.C.), during the first six months of 1956 totalled \$443,242,746 for 269 such gifts. The two largest recipients were colleges and universities, \$242,845,574, and hospitals and health agencies, \$129,551,025.

Corporate income tax returns for 1953 showed deductions for philanthropic giving totalled \$494,517,000, an increase of \$96,-

000,000 over 1952. According to the American Association of Fund-Raising Counsel, 1955 corporate giving totalled an estimated \$528,460,000. With the increasing number of business firms setting up programs for charitable contributions, the 1956 estimate exceeded \$625,000,000.

Estimates for religious giving which, for the most part, is by individuals exceeded \$3,000,000,000 for 1956.

The greatest increase in dollar volume of giving in 1956 apparently was in the foundation field, where estimates of grants and appropriations ranged from \$750,000,000 to \$950,000,000. The Ford foundation, on three appropriations made in 1955, totalling \$560,000,000 to the nation's privately supported universities, medical schools and hospitals, paid out in 1956 more than \$246,000,000.

According to a study of giving to 50 leading colleges and universities, 15 returning the 1955-56 questionnaire reported that total giving was running 38% ahead of 1954-55, not including first payments on the Ford foundation endowment and accomplishment grants. If Ford foundation grants were included, giving to those 15 institutions was more than 50% ahead of the 1954-55 fiscal year.

(See also COMMUNITY CHEST—UNITED FUND; EDUCATION; SOCIETIES AND ASSOCIATIONS, U.S.) (J. P. J.)

Draft: see SELECTIVE SERVICE, U.S.

Drama: see THEATRE.

Dress: see WOMEN'S FASHIONS.

Drought: see METEOROLOGY; SOIL CONSERVATION.

Drug Administration, U.S. The 50th anniversary of the federal drug control, which began with the Food and Drugs act of 1906, was celebrated throughout 1956, focusing attention on past achievements and future needs. Rewritten and strengthened in 1938 as the Federal Food, Drug and Cosmetic act, it is enforced by the Food and Drug administration (FDA), a unit of the department of health, education and welfare.

All aspects of the medical program relate to safety. Purity, quality, identity and labelling, including therapeutic claims, are required to measure up to safety requirements.

Research in medicine and pharmacology led to the development of many new drugs which the 1938 act required to be tested for safety, with supporting evidence evaluated by the Food and Drug administration. Applications for 520 new drugs were submitted during the fiscal year 1956, including 438 for human use and 82 for veterinary use. In the same period, 407 were allowed to become effective, 346 for human use. Many supplementary applications were received and 2,492 went into effect, half for veterinary preparations.

Some of the drugs considered during the year were tranquillizing agents, some nonbarbiturate hypnotics and sedatives, two general anaesthetics administered by intravenous injection, an antibiotic useful in staphylococcal and protein infections resistant to other agents, and others.

The pilot study initiated in 1955 for reporting adverse effects of drugs on some patients was expanded to include 11 leading hospitals, in collaboration with national medical and hospital groups. The preliminary study indicated that safety tests in the laboratory or conducted on limited groups were not sufficient. Results from a larger group would be more effective for evaluating any risks involved.

Growing awareness and concern over the hazards connected with careless storage of many household products resulted in a campaign in co-operation with other public health groups. While 12 caustic poisons were required to bear a poison label, many other products in common household use, such as some silver

polishes, cleaners, detergents, insecticides and drugs, can also be poisonous. A leaflet warning against accidental poisonings was issued by the FDA and given wide distribution. An advisory ruling was issued recommending that manufacturers label aspirin and other salicylates with warnings to keep them out of the reach of small children, and the drug industry responded commendably.

Congress made a special appropriation to the FDA to maintain surveillance over national distribution of the Salk polio vaccine in 1955 when the supply was short. From Aug. 1955 to June 1956, inspections were made of manufacturers, wholesalers and retailers to audit distribution records. No major abnormalities developed. As the supply increased, it appeared that the special program would not be required for the 1957 fiscal year and that surveillance could be maintained as part of normal drug operations.

Twenty drug recalls were supervised during the year, for deviations from the labelled potency, contamination of injectables and an eye medicine, corrections in dosage directions and expiration dates, dangerous pressure in bottles after shipment and toxicity to experimental animals.

Illegal sales of drugs continued to account for the majority of drug prosecutions. Cases were filed against 114 drugstores, pharmacists, lunch counter and tavern operators and employees, filling station operators and peddlers. Twenty-two of the actions, involving 42 defendants, were developed from complaints that truck drivers were using illegally obtained "stay awake" pills and were jeopardizing highway safety.

False and misleading claims were the causes of other actions. A public warning was issued with regard to a cancer clinic which had been enjoined previously from shipment of misbranded drugs. Two brothers were fined and placed on probation for the mail-order distribution of an inert glandular product, misrepresented as to origin and misbranded with sex rejuvenation claims.

The manufacturer and distributor who continued shipments of "orgone energy" devices after an injunction were prosecuted for criminal contempt, sentenced to jail and fined. The distributor of a misbranded ulcer remedy, who had contested a seizure and continued the misbranding after the case was decided in favour of the government, was fined and the responsible officers placed on probation.

Among the 51 medicines seized for false and misleading claims were articles composed of dried alfalfa, cereal grass, apple derivatives, buckwheat flowers, powdered pumice, phosphates, sulphates, papaya, royal jelly or an irrational mixture of one or more of these with vitamins and minerals. Among these medicines, claims could be found for the treatment or prevention of almost any disease known to man.

Twelve veterinary medicinals were seized for misbranding or for violation of the new-drug and antibiotic certification requirements.

Domestic drug and device shipments seized totalled 142 actions, based on 286 violative samples. Three injunction and 30 criminal prosecution actions were recommended for federal court action. Inspections were made of 3,215 drug and device establishments and 7,822 samples were collected. Of 3,429 import drug shipments inspected, 2,409 were refused entry because of failure to meet U.S. requirements.

During the fiscal year, 337 batches of insulin and insulin products and 18,183 batches of antibiotics were certified after passing tests for purity, potency and stability. Also certified were 776 batches of coal-tar colours, representing more than 5,000,000 lb. for use in foods, drugs and cosmetics. (G. P. L.)

Drug Production and Sales.—A rise of almost 20% from the preceding year in the volume of drug production in 1955 was

Table I.—U.S. Production and Sales of Medicinals

	1954	1955
Production	65,884,000 lb.	78,227,000 lb.
Sales		
Quantity	53,232,000 lb.	68,533,000 lb.
Value	\$425,835,000	\$465,121,000
Average value per lb.	\$8.15	\$6.79

Source: U.S. Tariff Commission, *Synthetic Organic Chemicals, U.S. Production and Sale of Medicinals, 1955.*

Table II.—Value of Medicines Shipped by U.S. Manufacturers

	1953	1954
Pharmaceutical preparations	\$1,514,234,000	\$1,584,697,000
Medicinal chemicals	363,390,000	273,461,000
Inorganic and organic medicinals (bulk type)	346,800,000	266,035,000
Drugs of animal origin (uncompounded)	16,590,000	6,832,000
Biological products	69,565,000	79,822,000

Source: U.S. Bureau of the Census, *Annual Survey of Manufactures, 1953 and 1954 Census of Manufactures*, preliminary report.

Table III.—U.S. Consumer Expenditures for Prescriptions, Other Medicines and Auxiliary Health Aids*

	1954	1955
Physicians' prescriptions		
Number:		
Drug store	484,300,000	529,000,000
Other retail stores	10,400,000	10,400,000
Total	494,700,000	539,400,000
Amount:		
Drug store	\$1,069,000,000	\$1,233,600,000
Other retail stores	23,000,000	24,200,000
Total	1,092,000,000	1,257,800,000
Other medicines		
Drug store	\$ 588,020,000	\$ 627,390,000
Other retail stores	330,700,000	373,360,000
Total	918,720,000	1,000,750,000
Auxiliary health aids*		
Drug store	\$ 277,010,000	\$ 288,620,000
Other retail stores	258,870,000	278,930,000
Total	535,880,000	567,550,000
Total for prescriptions, other medicines, and auxiliary health aids*		
Drug store	\$1,934,030,000	\$2,149,610,000
Other retail stores	612,570,000	676,490,000
Total	2,546,600,000	2,826,100,000

*Includes prescription accessories, first-aid products, foot preparations, veterinary medicines, feminine and baby medicaments.
Source: *Drug Topics* (March 5 and Aug. 6, 1956).

revealed in the reports of the U.S. Tariff commission. Sales were up nearly 29% in quantity, but the increase in the value of these sales was slightly more than 9%. As a result, the average per pound value of drug sales dropped from \$8.15 in 1954 to \$6.79 in 1955.

Expenditures for physicians' prescriptions were up more than 15% in 1955. The number of these prescriptions increased more than 9%, and the average price per prescription rose from \$2.21 in 1954 to \$2.33 in 1955. Approximately 98% of physicians' prescriptions were filled in the 53,500 drug stores in the United States.

Sales of nonprescription packaged medicines were up nearly 8% to set a record for the year. Sales of auxiliary health aids also increased, by almost 6%. Articles in this category include prescription accessories, first-aid products, foot preparations, veterinary medicines and feminine and baby medicaments.

In the export market, trade barriers, currency and foreign exchange restrictions, quota limitations and other restrictions imposed by foreign governments continued to restrict greatly and even to stop altogether the sales of U.S. drug exporters in some of their overseas markets. (P. C. O.)

Drugs: see AGRICULTURAL RESEARCH SERVICE; ALLERGY; BIOCHEMISTRY; BLOOD, DISEASES OF THE; CHEMISTRY; CHEMOTHERAPY; DERMATOLOGY; DRUG ADMINISTRATION, U.S.; ENDOCRINOLOGY; MEDICINE; NARCOTICS; PUBLIC HEALTH SERVICE, U.S.; STOMACH AND INTESTINES, DISEASES OF THE; VETERINARY MEDICINE. See also articles on specific diseases, such as CANCER; DIABETES; etc.

Drug Traffic: see NARCOTICS.

Drunkenness: see INTOXICATION, ALCOHOLIC.

Duke Endowment: see SOCIETIES AND ASSOCIATIONS, U.S.

Dulles, John Foster (1888–), U.S. cabinet member, was born on Feb. 25 in Washington, D.C. He graduated from Princeton university, Princeton, N.J., in 1908 and was awarded a law degree at the George Washington university law school, Washington, D.C., in 1911. In World War I he served as a major on the army general staff, and after that war went to the Paris peace conference as U.S. counsel on reparations and other financial matters. Between the two wars he became a prominent international lawyer. In 1945 he was a member of the U.S. delegation to the conference to organize the United Nations at San Francisco, Calif.

In 1951, as U.S. ambassador-at-large, he travelled to both Asia and Europe to arrange for agreement among the World War II Allies, the U.S.S.R. excepted, to a peace treaty with Japan, which was signed on Sept. 8 by Japan and 48 noncommunist nations. Dulles prepared the foreign-policy plank of the Republican party platform in 1952 and after the national election of that year was designated Pres. Dwight D. Eisenhower's new secretary of state. He was sworn into office Jan. 21, 1953.

Dulles created a minor political furor in Jan. 1956 with his published "brink" statement that "the ability to get to the verge (of war) without getting into the war is the necessary art. . . . If . . . you are scared to go to the brink, you are lost." He continued his extensive travels during the year, attending another SEATO (Southeast Asia Treaty organization) conference in Karachi, Pak., in March, and later visiting Formosa, Korea and Japan.

Dulles played a major role in the conferences and negotiations that followed Egypt's nationalization of the Suez canal July 26, 1956. It was at his suggestion that the Suez Canal Users' association of western nations was organized, after he had declared that the United States did not "intend to shoot (its) way" through the canal. Shortly after the outbreak of Israeli-Egyptian hostilities Oct. 29, 1956, Dulles was hospitalized for major surgery.

Dutch Guiana: see SURINAM.

Dutch Overseas Territories: see NETHERLANDS ANTILLES NETHERLANDS NEW GUINEA; SURINAM.

Dyes. The discovery of mauve, the first synthetic dye, by Sir William Henry Perkin in 1856 was honoured throughout the chemical world during 1956, culminating in a week-long celebration in New York. This event was sponsored by the American Association of Textile Chemists and Colorists with the cooperation of 27 technical, chemical and scientific societies.

The United States dye industry continued to maintain a high level of production during 1956 despite a slight downward trend of approximately 10%. This anticipated falling off was primarily caused by fluctuations in textile activity, while other colour-consuming industries remained relatively stable. The increasing number of numerous synthetic fibres being developed continued to claim the attention of dye research.

Sales of U.S. dyes in the export field were down to the same degree as domestic, caused by intensified activities of European producers in world markets and their lower production costs. No significant changes in the price structure of U.S. dyes occurred.

According to official figures released by the U.S. tariff commission, production of all types of dyes in 1955 amounted to 167,472,000 lb., an increase of 17.1% over the 142,982,000 lb. produced in 1954. Sales of all dyes in 1955 totalled 155,458,000 lb. valued at \$180,909,000, compared with 137,463,000 lb. value at \$160,302,000, an increase of 13% in quantity and 12.8% in value. The average unit value of all dyes sold was \$1.16 per pound in 1955, a one cent reduction from the previous year. The vat-colour group continued to maintain the lead in both production and sales, accounting for 33% of the 1955 production and 31.7% of the poundage sold; direct dyes represented 19.1%, sulphur dyes 15.3% and acid dyes 8.9%.

Four chemical classes of dyes represented 83.7% of the total production in 1955: azo dyes accounted for 35.6%, anthraquinone vat dyes 23.5%, sulphur dyes 15.2% and indigoid and thioindigoid 9.4%. These classes also showed considerably increased production over the previous year: the output of anthraquinone vat colours was 26.6% higher, azo dyes increased 14%, indigoid and thioindigoid dyes 12.4% and sulphur dyes were 13.1% higher.

Sales of vat dyes other than indigo amounted to \$49,234,000, direct dyes \$41,368,000, acid dyes \$20,429,000 and sulphur colours \$6,639,000. Foreign invoice value of U.S. dye imports in 1955 was higher than in 1954. Switzerland regained top position with 50.33% of total imports, West Germany was next with 45.13% and the United Kingdom accounted for 4.02% of the total.

(A. G. BR.)

Other Countries.—A working party of the Organization for European Economic Cooperation reported that the demand for dyestuffs, in the short-term, was expected to be stable although some fluctuations in export demand were possible. In the medium term, the working party considered that the activity of the textile industry would ensure a slightly increasing demand for dyestuffs on home markets. The development of the textile industry in overseas countries and the rising standard of living also suggested a slightly increasing demand for dyestuffs. Leaders of the industry tended to be less optimistic about the long-term prospects. They referred to increased competition, pressure on prices, the building up of the dye industry in countries which formerly had imported their requirements, import quotas and other obstacles.

An International Fastness Label association was formed in Zürich, Switz., to promote interest in dyes of high fastness to light, washing and weather. It was proposed to introduce an international label bearing the name Felisol to denote textile dyed with approved dyes according to prescribed methods.



"THOSE HATS MAKE GOOD TARGETS," a 1956 cartoon by Justus of the Minneapolis Star (Minn.)

An important development was the introduction in the United Kingdom by Imperial Chemical Industries of an entirely new type of dyestuffs, the procions, which, unlike any other dyes, reacted with cellulosic fibres.

Further progress was made with plans to manufacture dyestuffs on a large scale in India. Indian dye output in the first half of 1956 was reported to be about 50% greater than in the corresponding period of 1955. (L. E. Ms.)

Ear, Nose and Throat, Diseases of. Surgical Restoration of Impaired Hearing.—

A "simplified" technique for the restoration of certain types of hearing loss was proposed during 1956 by Samuel Rosen and endorsed by many other otologic surgeons who had followed the surgical principles of the mobilization of the fixed stapedial footplate. This is the tiny ossicle or ear bone of the middle ear which is shaped like a stirrup and which becomes immobile through the replacement of a small holding ligament by bony tissue.

During recent years several operative procedures had been developed for certain types of hearing loss resulting from middle ear disease. These included:

1. Fenestration by the creation of a new window connecting the middle ear with the inner ear, as a substitute for the normal oval window. The operation is used in cases where the stapes or stirrup bone of the middle ear is held down (ankylosed) by a bony growth in a condition called otosclerosis.

2. Tympanoplasty by the microscopically controlled removal of adhesions (scars), proud flesh and dead bone, for partial relief of hearing loss resulting from chronic inflammatory middle ear infections.

3. Stapes mobilization, which is also an operation for otosclerosis. The principle of this procedure is to loosen the stapes footplate from its fixed position in the oval window while leaving the ossicular chain intact.

It is unfortunate that the idea had been expressed that otosclerosis is a very common cause of impaired hearing and that stapes mobilization for otosclerosis is a "simple" operation. Neither of these notions is correct, according to Milos Baskak and E. P. Fowler, Jr. Stapes mobilization is admittedly less time-consuming for the surgeon, less costly to the patient, than, for example, fenestration, and there is rarely troublesome post-operative care.

A study by Rosen of the cases in which the attempt to mobilize the footplate did not result in improved hearing suggested the following possible explanations: (1) an extreme degree of fixation of the footplate which does not yield; (2) thin and fragile crura which fracture under the force required to mobilize the footplate; (3) faulty technique; and (4) still unknown factors.

Hypometabolism in Relation to Ear, Nose and Throat Disorders.—A. R. Hollender called attention to the fact that in ear, nose and throat practice, as in medicine in general, modern concepts of endocrinology had diverted attention from older knowledge. These revised concepts had often totally disregarded the significance of other pertinent factors, especially those related to the problem of metabolism. Hollender's feelings were shared by Jerome A. Hilger, who discussed hypometabolism and its relation to otolaryngology.

From the facts presented by both Hollender and Hilger, it seemed that in certain otolaryngologic disorders even a mild hypometabolic state may be the influencing factor. Sneezing, rhinorrhea, nasal discharge, hearing loss, headache and numerous other signs and symptoms have been ascribed to hypometabolism. Because the symptoms and signs are not clear-cut and easily recognized, the likelihood of endocrine dysfunction is rarely

considered. Experience had demonstrated that many clinicians regarded "subclinical" hypothyroidism to be of minor significance. Yet some degree of thyroid dysfunction may be present despite the fact that measured thyroid activity is normal. Results of therapeutic tests often serve as convincing evidence of functional irregularities.

The test most commonly employed in the past, and even at present, yields the determination of the basal metabolic rate (BMR). It remains the ideal method for most practical purposes, and while it is subject to inaccuracies from various influences, correctly and carefully performed it serves a highly useful purpose. More recently, use was made of the blood protein-bound iodine test (PBI).

This is a delicate test with definite advantages under certain circumstances over the basal metabolism test. In hypothyroidism, the result may be low or low normal.

Some confusion exists concerning the terminology employed to designate the subclinical form of hypothyroidism—hypometabolism—in which classical myxoedematous signs and symptoms fail to manifest themselves. Between the clinically obvious hypothyroid state and the normal there is a kind of no man's land in which the true or effective level of thyroid activity is not easily decided. In persons in whom a low basal metabolic rate is the only indication of hypothyroidism, clinical symptoms being absent, the dysfunction is probably a secondary process.

Nonmyxoedematous hypothyroidism—hypometabolism—produces definite changes in the nasal mucosa; is, according to Hollender, one of the underlying causes of vasomotor rhinitis; and frequently accounts for persistent postnasal discharge and, occasionally, for refractoriness of tubal obstruction, deafness and tinnitus. In growth of pharyngeal lymphoid tissue and in some headaches, alterations in metabolism sometimes play a prominent aetiological role.

Contrary to the general belief, patients with subclinical hypothyroidism do not become resistant to thyroid therapy; in fact, the drug can be withdrawn without disturbing effects if the causes of the hypometabolism are eliminated or corrected.

Lack of appreciation of the part played by endocrine dysfunction, more especially hypometabolism, in certain ear, nose and throat disorders could logically explain the futility of some time-honoured local procedures.

The Problem of Headache.—Head pain, which includes headache and neuralgias, is, according to Francis L. Lederer, to be regarded as a medical orphan. The patient complaining of headache deserves a complete physical, neurologic and ophthalmologic examination. Laboratory tests should be performed as necessary.

Howard D. Fabing discussed in detail tension headache as primarily caused by pull on the neck muscles. These cases require more than prescriptions. Careful history taking and a thorough physical examination should be followed by reassurance and explanation. Posttraumatic headache is regarded as similar to psychoneurotic headache, differing in that it follows a trauma to the head, usually severe enough to produce unconsciousness; it is frequently associated with sensitivity to noise and a subjective sensation of vertigo, usually brought about by a sudden change of the position of the head. Fabing found that migraine sufferers were driving persons with high ambitions and that their headaches were readily touched off by trivialities. These persons were characteristically perfectionists who complained of "bilious attacks," "sick headaches," "weak stomachs" and so on.

Paul S. Pentecost and John Adriani described an atypical head and face pain which may originate in the neck and can be diagnosed as well as controlled by blocking the nerves in the cervical plexus. According to A. Curtis Jones, Jr., headaches can be caused

by hypothyroid states and can be relieved by the administration of thyroid extract.

Functional Swallowing Disturbances.—Conditions affecting the function of swallowing but not the organ structure were discussed by John R. Lindsay. Changes in muscle action, alterations in innervation (nerve supply to the muscles) or disturbances of psychic (emotional) control are the common causes of functional swallowing disorders. The muscles of the soft palate, the constrictors and elevators of the pharynx and the muscles that close the upper aperture of the larynx (voice box) propel food through the pharynx. The action of these muscles is readily observed by direct examination with instruments, and symptoms of weakness or failure to function may be recognized. After the patient swallows a thick barium (radiopaque) mixture the action of the pharyngeal constrictor muscles and the cricopharyngeal sphincter muscle may be demonstrated on fluoroscopic examination or with spot X-ray films, special positions and manipulations. X-ray studies plus the use of parasympathetic-acting drugs were employed by Stanley H. Lorber and Harry Shay to differentiate spasm and irregularity of action of the oesophagus and to provide a basis for treatment.

Symptoms of choking, dryness, burning, irritation, pain or a lump in the throat often denote psychic (emotional) disturbances. Such a disorder occasionally may be associated with organic disease, since severe anxiety or depression may be prominent with early malignant conditions. Psychogenic difficulty in swallowing (dysphagia) differs widely in severity, and X-ray and endoscopic (wherein a tube is passed down into the oesophagus through the mouth to reveal the entire passage) examinations are essential to exclude organic causes such as tumours, ulcers and the like.

In severe cases of neurosis, hysteria and even psychosis, psychiatric therapy may be required.

(See also HEARING.)

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Earnings, Company: see BUSINESS REVIEW.

Earthquakes: see DISASTERS; SEISMOLOGY.

East Africa, British: see BRITISH EAST AFRICA.

East Indies, Dutch: see INDONESIA; NETHERLANDS NEW GUINEA.

Eclipses of the Sun and Moon, 1957: see CALENDAR, 1957 (page 64).

Economics. Economic and industrial developments in 1956, the world around, continued to direct the attention of a sizable group of economists toward the subjects of growth patterns of backward areas, regional economics, locational analysis and the significance of technological change. The shift away from concern over the concepts and the models of static equilibrium and economic maturity continued through the first three-quarters of the year in both publication titles and research agenda. In view of the increased importance of cer-

tain newly significant raw materials, not ordinarily found in the highly industrialized areas, the old and oversimple distinction between the "have" and "have not" nations was disappearing. At the same time the so-called "backward" countries were providing useful laboratories for the observation of accelerated economic dynamism.

Population increases, rising standards of living, technological advances and continued high governmental expenditures kept aggregate incomes high in nearly the entire western world. In Britain, for example, the situation throughout the first half of 1956 could be described as one of more than full employment with moderately essential jobs going unfilled because of lack of man power. In the United States, in spite of a serious inventory cycle in the automotive industry, the gross national product again broke records at an annual rate of more than \$400,000,000,000 by the third quarter of 1956. This prolongation of postwar prosperity for another year led to a further reconsideration of theories with reference to the business cycle and economic fluctuations.

Theorists of the more nearly traditional stripe commented that western capitalism was the lucky beneficiary of the failure of dynamic depressants since the war to cause serious trouble. Difficulties had appeared but had always been counteracted effectively.

Optimists hoped that this dynamic pattern might continue. Pessimists saw no reason to rule out the possibility of a developing conjuncture of local depressants. They pointed to the possibility of inventory trouble appearing simultaneously in several important industries, expressed concern over the unprecedented volume of consumer and residential mortgage indebtedness, predicted some downward readjustments in stock market prices and were fearful about the effects of tightened bank money lending policies. They were sceptical about a prosperity built largely on the demand for durable consumables, high private investment and high governmental expenditures continuing indefinitely. Even these pessimists, however, saw nothing in the situation forecasting a repetition of the early 1930s. The dominant attitude was one of cautious optimism.

More forward looking theorists re-examined the depression-born work of J. M. Keynes to find the keys to continued prosperity, and the ideas of Joseph Schumpeter with his emphasis on dynamism and innovation. Developments in collective bargaining stimulated concern over certain aspects of wage theory. Statisticians continued to provide improved materials for induction, and abstract theorists, chiefly the econometricians, continued to sharpen the tools of deductive logic.

In 1956 as in 1955 price theorists, especially in their role as assistants in policy-making, were less concerned over the tradition-bound concepts of competition, oligopoly and monopoly and more interested in possible workable compromises between competition and oligopoly—workable total situations in markets containing elements which theorists of a few decades ago would have classified as monopoloid. Such objectives as the provision of cheap and plentiful goods for consumers, the insurance of continuity of production and the setting-up of a system of incentives for rational, careful and persistent innovation seemed to many modern price theorists to be more rational than those relating to maintaining specific market structures consistent with the competitive models of earlier times. The phrases "counter-vailing power," "workable competition" and "workable oligopoly" suggested this new emphasis. (See also BUDGET NATIONAL; BUSINESS REVIEW; CONSUMER CREDIT; DEBT, NATIONAL; EMPLOYMENT; FOREIGN AID PROGRAMS, U.S.; FOREIGN INVESTMENTS; INCOME AND PRODUCT, U.S.; INTERNATIONAL TRADE; STOCKS AND BONDS; WEALTH AND INCOME, DISTRIBUTION OF.) (G. J. C.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*The Basic Elements of Production* (1954); *Big Enterprise and the Competitive System* (1954); *Competition and Big Business* (1953); *Inflation* (1953); *Planning Our Foreign Policy* (Problems of the Middle East) (1955); *Productivity: Key to Plenty* (1949); *Round Trip: The U.S.A. in World Trade* (1952); *Working Together* (1952); *World Trade for Better Living* (1951).

Ecuador. A republic on the west coast of South America, straddling the equator, after which it was named. Ecuador is bounded on the north and east by Colombia, on the east and south by Peru and on the west by the Pacific ocean. It has an area of 105,743 sq.mi. (including the Galápagos Islands, a dependency of 3,029 sq.mi.) and a population (1950 census) of 3,202,757; (1955 official estimate) 3,675,000. About 60% of this figure represents Indians, 30% mestizos, 9% "whites" and 1% Negroes. Quito (pop. 1950 census, 209,932, 1954 est., 212,873) is the capital; other major cities (with 1950 census, 1954 est. in parentheses) are Guayaquil, the main port, 258,966; Cuenca 39,983 (53,871); Riobamba 29,830; Jipijapa 7,759 (8,000); Vinces 3,748; Chone 8,046 (10,000); Ambato 31,312; Loja 15,399 (18,000); and Latacunga 10,389 (18,000). The predominant religion is Roman Catholic. Presidents in 1956: José María Velasco Ibarra until Aug. 21; thereafter Camilo Ponce Enríquez.

History.—Pres. José María Velasco Ibarra, finishing his first full term in 1956, relinquished the office to Camilo Ponce Enríquez, the first Conservative to win the presidency in 60 years. The Conservative victory in the election on June 3 did not represent a marked increase in party support, the Liberal vote being split between three strong candidates.

The presidential campaign began in earnest in January and February, when the various parties convened to select slates. The Conservatives' Ponce Enríquez was expected to have a strong following, but the Frente Democrático Nacional and the Concentración de Fuerzas Populares appeared to have somewhat better prospects of winning. The Frente, a coalition of Liberals, Socialists and independents, selected Raúl Clemente Huerta as standard bearer after prolonged convention balloting. Carlos Guevara Moreno was the C. F. P. candidate. An independent who entered the race with the support of moderate Conservatives and Liberals, and for whom the followers of Velasco Ibarra later declared themselves, was José Chiriboga Villagómez, former ambassador to the United States.

Clemente Huerta seemed to be the strong contender as the campaigning neared its climax. However, Velasco Ibarra, an important factor, revealed a preference for Conservative Ponce Enríquez shortly before the election. The margin of victory was small; Ponce Enríquez received more than 178,000 votes, Clemente Huerta in excess of 175,000 votes, Guevara Moreno nearly 150,000 votes and Chiriboga Villagómez more than 110,000 votes.

Serious threats to the continuity of orderly government occurred on June 29 and Aug. 8. President Velasco Ibarra was advised while en route to Riobamba that a garrison revolt was pending upon his arrival. He turned back to Quito in his plane, and loyal troops arrested officers who had conspired to exile the president and to replace him with Col. Reinaldo Varea Donoso, a former defense minister. A more subtle diversion by disgruntled opponents of the Conservative president-elect was a boycott by deputies of the inaugural session of the lower house. It was designed to prevent the chamber from approving his inauguration. Faced with the prospect of losing certain privileges of office, however, the opposition became more tractable, and the ceremony took place on the scheduled day of Aug. 21. His cabinet appointments reflected the delicate position in which Ponce Enríquez, as a minority-party president, had been thrust. It was composed of Liberals, Social Christians and Conservatives.

Normal relations were re-established with Peru in February, when both countries agreed to exchange ambassadors. The border problem was unsettled, but no incidents disturbed the peace. Foreign petroleum companies were granted exploratory rights near the Colombian border and new concessions on the Santa Elena peninsula. (R. HN.)

Education.—In 1952 there were 3,706 primary schools with 7,487 teachers and 352,396 pupils and 182 secondary schools with 1,031 teachers and 32,390 pupils. Institutions of higher learning included four public universities, the Catholic university of Quito and the polytechnical school; they had a total of 411 teachers and 4,562 students in 1952. According to the 1950 census, 43.7% of those 10 years of age and over were illiterate.

Finance.—The monetary unit is the sucre, valued during 1956 at 6.6 cents U.S. currency, official rate, and on Oct. 15, 1956, at 5.17 cents, free rate. Ordinary revenue in 1955 was 730,270,000 sucres; ordinary expenditure, 665,735,000 sucres. The foreign debt on Dec. 31, 1955, was \$37,087,000; internal, 337,407,000 sucres. Currency in circulation (Sept. 30, 1956) was 740,000,000 sucres; demand deposits, 619,000,000 sucres. The U.S. department of commerce estimated U.S. direct private investments in 1955 at \$25,000,000. The cost-of-living index (Quito) stood at 99 in Sept. 1956 (1953=100). National income was estimated at 9,100,000,000 sucres in 1955.

Trade and Communications.—Exports in 1955 (Ecuadorian ports) totalled \$89,663,000; imports through the port of Guayaquil, \$88,751,000. Chief exports were bananas (41%), coffee (26%), cacao (21%), rice (3%) and crude petroleum (1%). Important imports included machinery, instruments and vehicles (32%), food, drink and tobacco (13%), metals and manufactures (13%) and textiles (12%). Leading customers were the U.S. (61%), western Germany (9%), Colombia (6%), Belgium (4%) and Italy (3%); leading suppliers, the U.S. (52%), western Germany (11%), the U.K. (6%), Belgium (6%) and Canada (5%).

Railway mileage is 698; in 1955 the railroads carried 553,818 metric tons of freight and 2,678,566 passengers. Mileage of roads suitable for motor vehicles was estimated in 1955 at 6,000–6,500. On Jan. 1, 1954, there were 5,500 automobiles, 10,000 trucks and 2,300 buses. Telephones (Jan. 1, 1955) numbered 12,000, 60.8% of which were automatic.

Agriculture.—Production estimates for the 1955–56 crop year included coffee 375,000 bags of 132 lb. each; cotton 15,000 bales of 480 lb. each; cacao 60,000,000 lb.; rice (rough) 250,000,000 lb. Exports in 1955 included bananas 26,150,000 count bunches (50 lb. each); coffee 384,000 bags; cacao 24,409 metric tons; rice 20,749 tons. Unofficial estimates placed the number of cattle at more than 2,000,000 and the number of sheep and goats at 2,000,000 in 1952. Forest exports in 1955 included tagua nuts 6,428 metric tons; balsa wood 3,999 tons. No rubber was exported in 1953–5.

Manufactures.—Production estimates for 1955 included sugar 70,478 metric tons; cement 146,287 tons; salt 49,965 tons; beer 56,974,000 bottles. Exports of *toquilla* (Panamá) hats totalled 1,285,000. Installed electric energy capacity (Dec. 31, 1955) was 63,000 kw.; production in 1955 (public use only) was about 212,000,000 kw.hr.

Minerals.—Production in 1955 included gold 15,289 troy oz.; silver 47,500 oz.; copper 15,289 kg.; lead 157 metric tons; crude petroleum 3,530,600 bbl. (J. W. Mw.)

Eczema: see DERMATOLOGY.

Eden, Sir (Robert) Anthony (1897–). British statesman, was born at Windlestone hall, near Bishop Auckland, Durham, Eng., June 12, and was educated at Eton college and at Christ Church, Oxford. In 1923 he was elected to the house of commons. In 1931 he became undersecretary of state for foreign affairs. He was made lord privy seal in 1934 and minister for League of Nations affairs a year later. Eden became foreign secretary in 1935 but resigned in 1938 because of disagreement with Neville Chamberlain's policy toward Italy. At the outbreak of World War II he returned to government as dominions secretary, and when Winston Churchill became prime minister in 1940 Eden was appointed secretary of state for war and, later that same year, foreign secretary. He was appointed deputy prime minister and foreign secretary in 1951, and on April 6, 1955, he was appointed prime minister.

Eden arrived in the United States on Jan. 30, 1956 with foreign secretary Selwyn Lloyd and, after meetings with Pres. Dwight D. Eisenhower and John Foster Dulles, secretary of state, he flew to Ottawa, Ont., for discussions with the Canadian prime minister, Louis St. Laurent.

In a debate on March 12 Eden was put on the defensive by Hugh Gaitskell concerning the alleged mishandling of middle eastern affairs; at this time his prestige as a statesman seemed to be diminishing even in the eyes of his supporters.

He presided at the conference of Commonwealth prime minis-

ters, June 28–July 6. After Pres. Gamal Abdel Nasser's announcement on July 26 of the nationalization of the Suez canal, Eden said to parliament on Aug. 2 that various "precautionary measures of a military nature" were being taken. In a radio and television broadcast on Aug. 8 he declared "we do not seek a solution by force, but the broadest possible international agreement."

After the outbreak of larger-scale hostilities between Israel and Egypt (Oct. 29), Eden announced to parliament the Anglo-French ultimatum to the combatants. The next day followed Anglo-French military action against Egypt which, he declared, was not war but "armed conflict." The general assembly of the UN having voted overwhelmingly (Nov. 2) against the attack, Eden made a radio and television broadcast in which he stated that the invasion of Egypt was "police action" and declared that "if the United Nations would take over the police action we would welcome it." Events and world opinion seemed to be too much for Eden and he ordered a cease fire to take effect from Nov. 6. He was visibly a tired man and on Nov. 19 he was persuaded by his medical advisers to take a rest and flew to Jamaica for a holiday on Nov. 23.

Besides many foreign indications of disapproval of his policy, he had to face at home the resignations of two junior ministers; allegations in the press that R. A. Butler was in strong disagreement with him; and newspaper and opposition demands for his resignation. Nevertheless he was still considered to have considerable support for his actions.

Education. The outstanding events in education in the U.S. from Oct. 15, 1955, to Oct. 15, 1956, included the following: (1) the persistence of the shortage of qualified teachers, sufficient funds for educational activities and adequate school buildings; (2) the consistent rise in school attendance for the 12th year in a row; (3) the White House Conference on Education, which drew attention to the need for more and better schools; (4) the defeat in congress of a bill for federal aid to education; (5) the constant rise of the number of college students, indicating the beginning of the tidal wave expected for 1960; (6) the continuing slow progress of racial integration in education in the face of active opposition in some southern and border states; (7) the end of the G.I. Bill of Rights, which provided opportunities in education on the secondary and higher levels to large numbers; (8) the growing recognition of the shortage of brain power, especially scientists and engineers, and the factors associated with limited enrolments in those fields, such as poor teaching; (9) the increasing concern in educational, governmental and other circles over the education of the gifted child and youth; and (10) the rapid growth of the movement for the use of television in teaching on all scholastic levels.

Statistics.—Early in September the U.S. office of education of the department of health, education and welfare released its annual estimate of enrolment for the year 1956–57 as follows: kindergarten through grade 8, public, private and parochial, 29,618,000, an increase of 1,103,800 over the previous year; secondary schools (grades 9 through 12), public, private and parochial, 8,111,600, a rise of 364,500; higher education, 3,232,000, or 236,000 more than in 1955–56; private commercial and nurse training schools, 591,400, or 50,000 over the figure of the previous year. The grand total of 41,553,000 marked an increase of 1,754,300 and represented 24.9% of the entire population of the U.S.

The office of education also reported the following significant facts: a shortage of 51,400 classrooms in the elementary and secondary schools to accommodate increased attendance; the need for 120,700 additional qualified teachers, which would have to be supplied by emergency teachers, the return of former teachers and overcrowding of the classes; and predicted increase

in enrolment of 30% from 1956 to 1965.

Federal Participation in Education.—The White House Conference on Education, which had been called by Pres. Dwight D. Eisenhower in an effort to obtain information about the school crisis, took place in Washington during Nov. 28–Dec. 1, 1955. About 1,700 delegates, representing 48 states and five territories, arrived to deliberate on six major questions of importance to education in the U.S.: (1) What should our schools accomplish? (2) In what ways can we organize our school systems more efficiently and economically? (3) What are our school building needs? (4) How can we get enough good teachers—and keep them? (5) How can we finance our schools—build and operate them? (6) How can we obtain a continuing public interest in education? The most dramatic outcome of the conference was the approval by the delegates, by a vote of more than two to one, of the principle that the federal government should increase its financial participation in public education, in particular for the construction of school buildings. Significantly, the delegates voted almost unanimously to oppose any attempt by the federal government to control the money granted to local schools other than to require a fiscal accounting by the states. The final report of the Committee for the White House Conference on Education to the president, on April 6, 1956, was less enthusiastic about the principle of federal aid. Its point of view was that federal funds "should be provided under the philosophy of encouraging greater use of state and local funds for school purposes"; that "the best schools can be produced by continuing to assign to the states and local districts primary responsibility for financing, organizing, administering and controlling the public schools"; and that federal aid "to all the states can be justified . . . only on a temporary basis to meet an emergency situation such as the present school building emergency."

In his special educational message to congress, Jan. 12, President Eisenhower strongly urged annual federal grants of \$250,000,000 a year for five years "to supplement local construction efforts in the neediest school districts," as well as a total of \$750,000,000 in federal credits over the same period of five years to stimulate local school authorities to construct the estimated 470,000 needed classrooms. When action on the school construction bill was still being held up by the house of representatives, the president, in his letter of May 14 to Neil McElroy, chairman of the Committee for the White House Conference on Education, made a special plea for a congressional law to furnish federal aid to help meet the school emergency. He pointed up this need for federal aid to education as "one of the major goals" of his administration.

After much delay, the Kelley bill (H.R. 7535), which differed in details from the president's plan, came up on July 5 for a vote before the house of representatives. The situation had become even more controversial than usual because of the Powell amendment, which specified that no funds were to be given to states which failed to comply with decisions of the supreme court. This was an obvious reference to the attitude of many southern states to the supreme court decision declaring unconstitutional the practice of racial segregation in the public schools. The complication was illustrated in the voting: 148 Republicans and 77 Democrats supported the Powell amendment, and 140 Democrats and 46 Republicans opposed it; 119 Democrats and 75 Republicans favoured the Kelley bill (including the Powell amendment), while 119 Republicans and 105 Democrats voted against it.

The following months saw charges and countercharges by both political parties as to the responsibility for the defeat of the bill. The major outcome of the congressional struggle over federal aid to education was that no positive action was taken.

during the year. Educators and interested laymen were beginning to wonder if there was any possibility for legislation for any kind of federal aid to school construction, let alone for the broader programs of federal educational aid.

Congress passed several laws of concern to education during 1955-56. Public law 597 (June 1956) provided a five-year program of federal grants up to \$7,500,000 each year to the states for the improvement of library services in the rural parts of the country. Public law 465 (April 1956) extended and increased the special school milk program through 1958. Other acts were the extension until 1958 of public laws 815 and 874 (81st congress), which offer funds for the construction and operation of schools in localities affected by federal activities, and grants for the education of nurses and public health specialists.

President Eisenhower appointed in April a National Committee for the Development of Scientists and Engineers "to foster the development of more highly qualified technological manpower." Later in the same month he set up a Committee on Education Beyond the High School to study the problems of higher education, professional education and adult education and to recommend policies for federal action.

Elementary and Secondary Education.—Late in Nov. 1955 the National Manpower council issued a report, "Improving the Work Skills of the Nation," in which it urged the nation to improve its high schools by stressing the fundamental subjects and work habits, so that there would be an adequate supply of skilled manpower to meet the technical competition of the U.S.S.R. All through the year, educators and other specialists continued to assess the teaching of specific subjects in the schools. At the February meeting of the American Association of School Administrators, various leaders admitted the shortcomings of the schools' instructional program, but insisted that the children of today can spell, read and write as well as their parents can. Defenses of educational work were previously made, in November, by two bodies of teachers. The National Council of Teachers of English upheld the current procedures used in the teaching of reading, while the National Council for the Social Studies praised the teachers and the pupils of the nation for the children's interest and alertness in national and world affairs. The New York state education department announced in June that 45% of the high schools require two years of United States history, as compared with 25% in 1946. Of further interest to the teaching of the social studies was the suggestion by President Eisenhower in September that the schools teach the facts of communism, so that the children could "discriminate between truth and falsehood . . . between the American form of government and the Soviet form."

Much attention was showered upon the teaching of science and mathematics during 1955-56. In many instances, comments upon the insufficient number of pupils in these subjects were accompanied by warnings that the U.S.S.R. was forging ahead in scientific and technical education. One scientific authority, Pres. A. DuBridge of the California Institute of Technology, claimed in July that improper teaching and inadequately prepared teachers were responsible for the avoidance of science and mathematics by high school pupils. Several weeks earlier, in June, DuBridge had stressed the importance of a larger and better supply of scientific personnel, but urged that Americans should not get hysterical over statements that "the Russians are getting ahead of us." A survey reported by Purdue university in September revealed that high school pupils were not interested as a rule in careers in the field of science. Only two days later the National Association of Secondary School Principals announced the results of a survey which indicated that many of the current high school graduates about to enter college were attracted to careers in engineering and science. Other



TWELVE-YEAR OLD HARVARD FRESHMAN, Fred Safer, Jr. (right), registering for classes at the opening of the 1956 fall term. Safer was given a scholarship after making a perfect mark in advanced mathematics in his college entrance examination

items of interest were the results of a survey by the Educational Testing service, reported in June, showing that teachers of mathematics were poor in knowledge and teaching ability; and the announcement by the office of education, also in June, that enrolments "in mathematics and in principal science courses in high school are larger now than they were 20 years ago." While there was an apparent lack of agreement about the facts of the situation, it was evident that some concrete steps were being taken by educational authorities to improve the situation in the teaching of science and mathematics in the high schools of the country.

There was some action during the year to encourage gifted children and youth. More than 60,000 selected high school seniors in 10,800 schools all over the country in Oct. 1955 took tests to determine the 445 winners of college scholarships under the new national merit scholarship program. The highest scorers on the first test took subsequent tests after the start of the new year, and the successful candidates were named in the spring. Late in November Charles C. Cole, Jr., assistant dean of Columbia college, Columbia university, proposed on the basis of a survey published several months later, an annual program of 100,000 scholarships costing \$200,000,000 to make it possible for gifted young persons to go to college.

The use of television in education was greatly stepped up in 1955-56. In Dec. 1955 the Ford foundation made grants totaling \$6,493,840 to the Educational Television and Radio centre and the Joint Council on Educational Television, located at Ann Arbor, Mich., and Washington, D.C., respectively, for the co-ordination and expansion of educational television. The council reported in June 1956 that there were 25 stations on the air and that seven more communities were expected to set up stations for the transmission of television programs devoted to education. Schools in various communities and colleges all over the country made use of closed circuit television programs in

their educational work. Much attention was given in the press to the project in Hagerstown, Md., which began in September to teach the basic and other subjects in the curriculum by means of regular television lessons. Opinion was divided among educators as to the role of television in classroom instruction.

Higher Education.—The continuous increase in higher educational enrolments was shown in the estimate revealed in Dec. 1955 by the U.S. office of education, 2,716,000, or 8.6% greater than the previous year, "an all-time record," according to Commissioner Samuel M. Brownell; and in the figure published by Raymond Walters in *School and Society* (Dec. 10, 1955), 1,612,225 full-time students in 886 approved colleges and universities, a 9% rise over 1954. The Veterans administration reported in November an attendance of 341,000 college students under the Korean G.I. Bill of Rights, 50% more than in 1954.

On July 25 the G.I. Bill of Rights for World War II veterans was concluded, except for the voluntary enlistees of the year Oct. 1945 to Oct. 1946. Since 1944 more than 7,800,000 veterans, or 50% of those who had served during the war, had taken advantage of the law giving them educational benefits, with large numbers attending colleges.

Some improvement took place during the year with regard to professors' salaries. Increases were announced by a number of institutions, in some cases up to 25%.

The foundations were active in allocating financial grants to colleges and universities. Late in Dec. 1955 the Council for Financial Aid to Education estimated a total of \$507,000,000 in grants and gifts to all types of institution during the fiscal year 1954-55. The council also reported in Sept. 1956 that 49 business firms gave almost \$25,000,000 for higher education in 1955. In June seven noted private universities adopted an eight-point guide for soliciting unrestricted gifts from industry for independent teaching and research.

The Ford foundation gave the largest sums to the most institutions: Dec. 1955, \$1,600,000 for the revision of the Yale law school curriculum, \$210,000,000 to raise the salaries of professors in private liberal arts colleges and \$90,000,000 to improve instruction in private medical colleges; April 1956, \$296,000 to expand international law studies at Cornell university; June, \$1,275,000 for international relations studies at Columbia university; September, \$570,000 for fellowships in economics and business administration to encourage teaching and research in these fields; and October, \$1,725,000 for a five-year program to stimulate and support the publication of scholarly studies in the humanities and the social sciences. Other grants were as follows: Fund for the Advancement of Education, \$502,000 to 34 public and private colleges for improving their teaching resources as enrolments mount (April); Carnegie corporation, \$1,500,000 to the Institute of International Education (February), \$750,000 for research institutes in higher education at the University of California and at Teachers college of Columbia university (May) and \$375,000 for a centre on higher educational statistics at the American Council on Education (May); U.S. Steel foundation, more than \$1,000,000 to more than 500 higher educational institutions (April); Commonwealth fund, \$7,150,000 for medical education (Nov. 1955); and Sealantic fund, \$10,375,000 for theological education (Dec. 1955).

The importance of providing opportunities for higher education to all who are capable of it was frequently stressed during the year, especially in a statement prepared in March by the American Council on Education for the use of the President's Committee on Education Beyond the High School. This was published later in the form of a 125-page book, *The Strength to Meet Our National Need*. The enrolment pinch was already beginning to be felt in 1955-56 all over the nation. *New York*

Times surveys in June showed qualified students were denied admission to colleges in New York state because of the shortage of facilities and that most state universities were limiting the number of students from other states.

The problem of enrolments and instruction in science and engineering was the object of much concern during the year. In January the Massachusetts Institute of Technology announced that it would establish a school for advanced study for advanced theoretical studies and research in the sciences, while the Rockefeller institute revealed plans for the opening of a graduate school to develop research experts in the natural sciences. With reference to enrolments, numerous speakers and writers reminded the nation of the insufficient scientists and engineers being trained. Very often comparisons were made with the production of scientists and engineers in the U.S.S.R. Thus, the National Science foundation reported in August that Soviet institutions graduated twice as many scientists in 1955 as did those in the U.S. On the other hand, some warned of the dangers of unlimited expansion in these fields. In the spring, the Engineering Manpower commission of the Engineers Joint council disclosed that engineering enrolments were rising so rapidly as to outstrip available funds, facilities and faculties in the professional schools. More particularly, the American Society for Engineering Education stated late in June that there would be a shortage of 1,300 engineering teachers for 1956-57 enrolments. Warnings that too much stress on the need for scientific personnel and pressure for students to enrol in science courses would result in the weakening of the humanities and the social sciences were made at the Oct. 1956 conference of the American Council on Education.

In spite of the fact that there was a record number of students of medicine, as reported by the American Medical association—28,639 in about 80 schools—there were demands in medical circles for the solution of the "critical" shortage of physicians. The financial plight of the dental schools was pointed up in the Oct. 1956 convention of the American Dental association.

Other events in higher education during 1955-56 included the following: the placing on probation, in May 1956, of Texas Agricultural and Mechanical college, the University of Kansas, Mississippi college, Alabama Polytechnic institute, the University of Louisville and the University of Florida by the National Collegiate Athletic association for violation of rules of athletic competition; the penalization and placing on probation also in May, of the University of Washington and the University of California at Los Angeles by the Pacific Coast conference, and the approval of these decisions by the N.C.A.A. in August; the decision by the University of Illinois in Dec. 1955 to discontinue the teaching of remedial English in 1960; and the establishment in Oct. 1956 of a clearinghouse of private and public colleges for the co-ordination of research projects and for the co-operative use of faculty members.

The Teacher Situation.—The ninth annual report on teacher supply and demand by the National Education association, released in April 1956, indicated that 96,000 new teachers (38,731 for elementary schools and 57,348 for high schools) would be graduated in June. This was an increase of 9.9% over the figure for the previous year. Nevertheless, there was a shortage of 190,000 teachers, according to the report.

The salary question involving teachers played an important role in many communities. Some, such as Long Beach, N.Y., raised the maximum salary for teachers to \$9,500 a year. In May the teachers of Irvington, N.J., went on strike for a day to emphasize their need for salary increases. The board of education of New York city voted in May to raise the salaries of the teachers and to compensate high school teachers for extra-

curricular activities after school hours, but dissatisfaction remained and the boycott of such activities was not called off.

Other developments in teacher circles included the decision by the N.E.A. in July to campaign strongly in behalf of federal aid to education, the ruling by the American Federation of Teachers in August to expel eight southern chapters if they did not end racial segregation of teachers by the end of 1957, and the announcement in January by the U.S. department of labour of plans to recruit retired army officers and other former military personnel to teach in high schools.

Adult Education.—In June 1956 President Eisenhower signed public law 597, which granted \$7,500,000 a year for five years to libraries in rural communities having fewer than 10,000 persons. The president stated that the new law "shows promise of leading to a significant enrichment of the lives of millions of Americans." Another action which was expected to benefit adult education was the establishment in September of the Council on Library Resources with a \$5,000,000 grant from the Ford foundation. The aim of this new organization was to search for new procedures and devices to enable the libraries to give better and faster service, especially in connection with research activities. A survey by the New York state education department revealed on Oct. 13, 1956, that more than 1,000,000 inhabitants lived in communities that had no public libraries, that almost 400,000 lived too far from the libraries in their towns or districts and that several hundreds of thousands more lived in villages which supported libraries failing to meet the minimum standards of library service.

Academic Freedom.—In April the U.S. supreme court, in a five-to-four decision, ruled that the board of higher education of New York city did not have the right to dismiss Harry Slochower, associate professor of German at Brooklyn college, for invoking the privilege of the 5th amendment against self-incrimination in regard to membership in the Communist party. The court stated in the majority opinion, "At the outset we must condemn the practice of imputing a sinister meaning to the exercise of a person's constitutional right under the Fifth Amendment." Subsequently, near the end of May, the supreme court refused to hear the appeal of New York city, in spite of the fact that it was supported by the supreme courts of eight states and Hawaii.

There were several developments involving the issue of communism in education and related questions. The federal district court in Washington, D.C., acquitted Barrows Dunham, former professor of philosophy at Temple university, on Oct. 19, 1955, of charges of contempt of congress with regard to the use of the 5th amendment. The trustees of American university, late in Oct. 1955, dismissed Herbert Fuchs, professor of law, who had admitted to a congressional committee that he had once been a communist. In Nov. 1955 the New York state court of appeals ordered that a court trial be given to Charles W. Hughes, who had been dismissed from the faculty of Hunter college for refusing to give information about alleged communist affiliations. The state circuit court of Illinois in March 1956 upheld as constitutional the Broyles law, which requires teachers to take an oath that they are not communists.

On April 13 the federal district court in Washington, D.C., found Marcus Singer, professor of zoology at Cornell university, guilty of contempt of congress for not wishing to identify former communist colleagues. On the other hand, on the same day, the federal district court in Dayton, O., freed Lee Lorch, a professor at Fisk university, from charges of contempt of congress for not answering questions by the house committee on un-American activities. Commissioner Frederick M. Raubinger of the New Jersey state department of education in May ordered the board of education of Newark to reopen the cases of three teachers who had invoked the 5th amendment. In June the trustees of

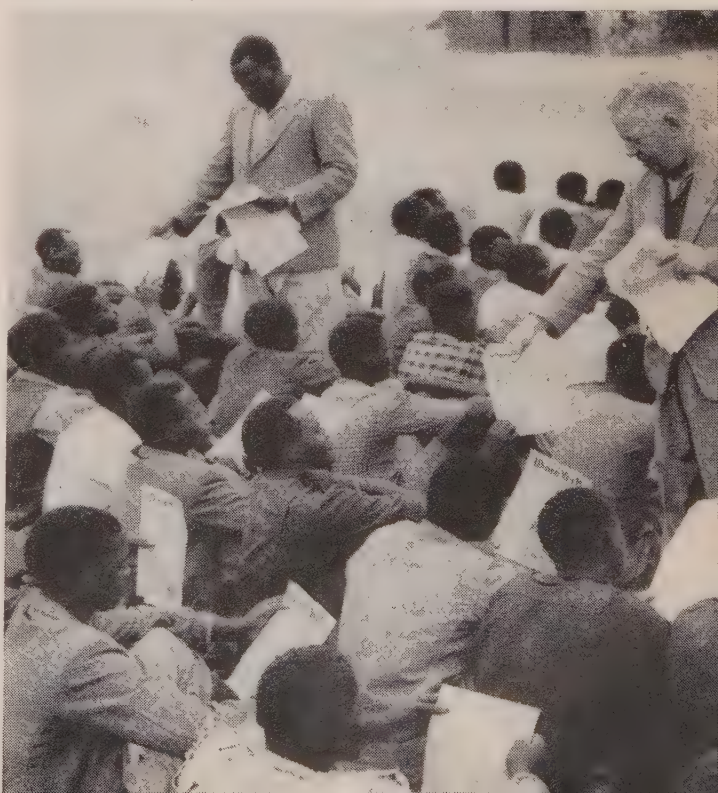
Dickinson college dismissed Laurent R. LaVallee because of his refusal to answer the questions of the house committee on un-American activities. The Pennsylvania state supreme court, also in June, ruled that teachers may be discharged on grounds of incompetency if they do not want to say whether or not they have ever been communists.

Commissioner James E. Allen, Jr., of the New York state department of education handed down a ruling in August which stated that teachers could not be forced to mention the names of other teachers who were or had been affiliated with the Communist party. A bitter controversy was ended in August with the approval by the New Jersey senate of John O. Bigelow as a member of the board of governors of Rutgers university. Judge Bigelow had been opposed by some senators because, in his capacity as a lawyer, he had represented a client who had invoked the 5th amendment and because he had doubted that a teacher should be discharged on the sole ground of pleading the 5th amendment at a congressional investigation.

The Race Problem.—The issue of integration of the races in the schools of the south was a very complicated one during 1955-56. Early in Oct. 1956 the Southern Education Reporting service revealed that 650 out of 3,711 school districts with Negro children in the 17 southern states (plus the District of Columbia) had completed or had begun the process of integrating the public schools. This involved the educational contact of 319,184 Negro children with nearly 2,000,000 white pupils, leaving about 2,400,000 Negroes in districts that were still segregated. The current figure of integrated Negro pupils represented an increase of about 60,000 over that of 1955. There was a net increase of 208 school districts engaged in the integrating process since the start of the 1955 school year. There was no desegregation at all in Alabama, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina or Virginia. The only area that had completely integrated its public school system was the District of Columbia, but integration of about 85% of the Negro pupils was under way in Maryland and Missouri.

On the level of higher education, the Southern Education Re-

FORMER MAU MAU TERRORISTS, detained in a Kenya work camp, being issued news sheets printed in the vernacular, part of the re-education program carried on in 1956 by British colonial officials for Kikuyu tribesmen



porting service stated that 110 out of 208 tax-supported colleges and universities in the southern states either admitted Negroes or were willing to do so.

Negro students were actually in attendance in about 100 institutions in 12 of the 17 states and in the District of Columbia, but they were still barred from the white public institutions of higher education in Alabama, Florida, Georgia, Mississippi and South Carolina.

From the statistical standpoint, there was evident progress in the campaign toward integrated schools. By way of contrast, there were signs which indicated that resistance to efforts at desegregation would continue. Thus, at the beginning of the 1956-57 school year, violence resulted when Negro children entered white schools in Kentucky, Tennessee and Texas, while less serious demonstrations of opposition took place in Maryland and West Virginia. Prosegregation laws were enacted in Virginia, and some states made attempts to ban through court action the National Association for the Advancement of Colored People.

The U.S. supreme court on March 5 unanimously affirmed the decision of a federal court prohibiting racial segregation in tax-supported colleges and universities, thus extending to higher education the principle laid down in the decision of May 17, 1954. The following week, the supreme court ordered the law school of the University of Florida to admit Virgil D. Hawkins, a Negro, without delay. When the case remanded to the supreme court of Florida, the state's attorney general requested the court to delay the Negro applicant's admission to the university, in spite of the U.S. supreme court decision. Early in May the U.S. supreme court upheld a lower court decision compelling Louisiana State university to admit a Negro applicant to its undergraduate college.

Because of the previous rulings by the supreme court against racial segregation in the public schools, and no doubt because of anticipated similar decisions in the future, there developed a demand among congressmen and states attorneys general to curb the court's power to invalidate state laws in conflict with national legislation.

In apparent disagreement with the statement by President Eisenhower on March 21 that "it is incumbent on all the South to show some progress" toward compliance with the policy of racial integration in the public schools, some of the southern states not only did not show any progress but also took steps to make segregation as strong as possible. In Alabama a Negro student, Autherine J. Lucy, who had been admitted to the school of education of the University of Alabama in February, was suspended after violence developed. After the federal district court of Birmingham ordered the reinstatement of Miss Lucy, the university expelled her for having made accusations against the institution in her court appeal. This expulsion was not overruled when the Negro student appealed once more in August to the federal court.

Among the other significant events affecting the racial issue in education were the following: students at the Georgia Institute of Technology forced the authorities to allow the football team to play an intersectional game in January with the University of Pittsburgh, despite the presence of a Negro player on the latter team; national attention was given by President Eisenhower and the press to the successful start by Louisville, Ky., in integrating its public schools; violence directed against desegregation in August and September at Mansfield, Tex., Clinton, Tenn., and at Clay and Sturgis, Ky., attracted the attention of the press in the U.S. and in many foreign countries; in February Mississippi joined the states which declared legislatively that the U.S. supreme court decisions against segregation were "invalid"; Texas Southern university, a Negro



STATE POLICE ESCORTING NEGRO STUDENTS to school at Sturgis, Ky., after mob violence protesting the racial integration of public schools in 1956

institution, enrolled several white students in September, but a violent crowd prevented two Negroes during the same month from entering Texarkana (Tex.) Junior college; despite picketing, in Oct. 1956, Negroes continued to attend the Lamar State College of Technology, Beaumont, Tex.; threats of violence forced a Negro Methodist church school of Camden, S.C., to discontinue an integrated class in July; Virginia adopted in September a program which would deny state funds to integrated public schools; in September the investigation of integration in the public schools of the District of Columbia by a house of representatives subcommittee led to charges of unfairness; West Virginia State college, a former Negro college, announced in Nov. 1955 that white students made up a third of its student body; the gap in educational achievement between white and Negro pupils was attributed by many educators to inferior school facilities; and a new journal, *Race Relations Law Reporter*, appeared in February with full and impartial documentation on all aspects of the controversial issue of racial segregation.

International Educational Relations.—The annual survey by the Institute of International Education showed 43,309 foreign citizens (36,494 students, 6,033 physicians and 782 teachers and research workers) from 132 nations, 9% more than in the previous year, were engaged in educational work during 1955-56 in 1,660 colleges and universities in the U.S. The institute received in July a ten-year grant totalling \$3,500,000 from the Ford foundation. The National Council on Asian Affairs was formed in Nov. 1955 to promote teaching and research about the nations of Asia. President Eisenhower in May urged that private foundations and universities open scientific and cultural centres to aid foreign nations and promote peace. The Fulbright act for the exchange of students and teachers abroad completed ten years of existence.

The United Nations Educational, Scientific and Cultural organization (UNESCO) had 77 member nations with the admittance of Bulgaria in May, Rumania in July and Finland in Oct. 1956. Late in Oct. 1955 the highest administrative tribunal of the United Nations ordered UNESCO to reinstate four American employees who had been discharged because they had refused to co-operate with a U.S. loyalty investigating board. The Economic and Social council of the United Nations in Dec. 1955 rejected the application by east Germany to join UNESCO on an equal basis with west Germany. Among UNESCO's achievements during the year were the publication in December of *World Survey of*

Education, a source of information on school organization and statistics; the joint sponsorship with the International Bureau of Education in July 1956 of the 19th International Conference on Public Education at Geneva, Switz., with 74 nations discussing problems of school inspection and the teaching of mathematics; and the setting up in August of an international agreement for the protection of artistic and other cultural treasures in time of war.

With ratification by the Netherlands in August, the number of nations signing the Council of Europe's convention on the equivalence of university entrance requirements reached 12. Also in August, the fourth assembly of the World Confederation of Organizations of the Teaching Profession, meeting in Manila, Phil., forced two European teachers' groups to give up their affiliation with the World Federation of Teachers Unions, located in east Germany.

World Trends.—The ministry of education of England and Wales stated in its annual report, released in July, that there were more than 6,500,000 pupils in publicly supported primary and secondary schools. Late in February the national assembly of France voted for the time being to defer consideration of a bill to end state aid to private school, including church school, students. In Belgium there was a controversy between those who wished to preserve and those who desired to weaken the study of Latin and Greek in the secondary schools and universities. In Dec. 1955, 80,000 secondary school teachers went on strike in Italy because of dissatisfaction with the amount of salary increases. In Cyprus primary school children joined violent demonstrations against the British in Feb. 1956, but in September Gov. Sir John Harding permitted the reopening of the island's secondary schools, which had been closed since the previous year because of the students' conduct. University students in Czechoslovakia submitted in May a resolution to the ministry of education in behalf of greater political freedom.

Much attention was given during the year by the U.S.S.R. to the training of scientific and engineering personnel, with full details and figures offered in Nicholas DeWitt's *Soviet Professional Manpower*, published by the U.S. government on Nov. 14, 1955. A U.S.S.R. official report in July indicated that schoolchildren were spending at least one-fifth of their time at school in the study of mathematics, since this subject was considered of the greatest importance for the discovery of special talents for advanced technical and scientific training. The constant stress on science and mathematics led to the protest during the winter by some Russian scholars that the classical studies were being neglected. The de-emphasis of Stalin was carried out by the publication of new textbooks and directives in history. In July the U.S.S.R. announced that a course in Communist party history, plus courses in political economy and historical and dialectical materialism, would be introduced in the fall in all institutions of higher education. The Tass news agency of the U.S.S.R. in January reported an attendance of 1,865,000 students, or 140,000 more than the previous year, in the universities. Also of interest in Soviet education were the announcements in March that church schools were being permitted on Sunday, and in June that a system of boarding schools would be set up and that school fees would be abolished in higher educational institutions and in the highest three years of the secondary schools.

In Dec. 1955 the Argentine government restored the autonomy withdrawn by former Pres. Juan D. Peron to the country's six universities. Ryukyu university in Okinawa in Aug. 1956 expelled six students on "charges of instigating anti-American activities." The Singapore government in Oct. 1956 closed two Communist-dominated Chinese schools and expelled students and

teachers.

In June the Japanese diet abolished the popular election of local school board members and placed the selection of textbooks under the authority of the ministry of education, thus reversing the school reforms introduced by the U.S. after World War II, in view of the fact that these policies had operated in favour of pro-Communist teachers. (W. W. BN.)

Canada.—Enrolment in Canadian public elementary and secondary schools in June 1955 totalled 3,012,700, almost 190,000 more than in June 1954. The number of teachers rose by 6,851 during the same period, to a total of 112,060. Full-time enrolment in institutions of higher education was estimated by the dominion bureau of statistics as 71,600 in Dec. 1955, an increase of 6.2% over Dec. 1954.

Problems arising from the increasing school enrolment continued to constitute a major concern of educational authorities, both provincial and local. The supply of fully trained teachers remained inadequate, despite a noteworthy rise in enrolment in teacher-training institutions. The shortage was becoming acute in secondary schools, where the percentage of increase in enrolment was almost twice as great as that in elementary schools. Several provinces undertook extensive revision of teacher-training plans, partly aimed at securing better integration of elementary and secondary programs; this would facilitate the improvement of professional qualifications of teachers in service who were unable to complete a full university course but who could now qualify as secondary school teachers through a series of steps.

In British Columbia the training of all teachers was placed under the authority of a college of education of the university, replacing the former system of one-year normal college courses for elementary school teachers. Emergency summer training courses were also being employed to improve the supply of secondary school teachers. A plan of this nature in Ontario provided professional training courses in two successive years for persons who were already university graduates.

Another emergency scheme in Quebec enabled "permit" teachers to qualify through summer courses for teaching certificates at either the elementary or secondary school level; previously, full-time attendance at a teacher-training institution had been a prerequisite.

In the field of educational finance, the Quebec provincial government for the second time assumed responsibility for long-term debts of school boards. In 1946 this government assumed such debts, amounting to more than \$100,000,000. Under the new legislation the government would pay half the capital and interest on all long-term debts contracted by school boards in the province since that time, except in two cities.

In Ontario and Alberta major studies were being made of methods of identifying at an early stage high school students most likely to succeed in university courses. Both studies sought to determine whether existing university selection and admission procedures were adequate to locate and encourage potential students, who were urgently needed for the best development of Canada's rapidly expanding economy. (F. K. S.)

(See also BLIND, EDUCATION OF THE; CENSUS, U.S.; CHILD WELFARE; HOME ECONOMICS; LIBRARIES; MOTION PICTURES; NEGROES, AMERICAN; RADIO AND TELEVISION. For statistics of institutions see UNIVERSITIES AND COLLEGES; see also under various states and countries.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Bring the World to the Classroom* (1938); *Horace Mann* (1951); *Making Films That Teach* (1954); *Mental Health* (keeping mentally fit) (1952); *New Tools for Learning* (1952); *Practicing Democracy in the Classroom* (1953); *Schoolhouse in the Red* (1949); *Using the Classroom Film* (1945); *Why Vandalism?* (1955).

Education, Religious: see RELIGIOUS EDUCATION.

Education, U.S. Office of: see EDUCATION.

Eggs. Production of chicken eggs in the United States in 1956 exceeded the record 67,000,000,000 eggs of 1955 and provided fully 365 eggs per capita for food consumption, 23% more than pre-World War II. In October production was 4% above a year earlier and one-fifth above the ten-year average.

As of Jan. 1, 1956, there were 382,218,000 chickens on farms as compared with 390,708,000 a year earlier and 449,649,000 average for the previous decade; potential layers numbered 359,696,000, a 3% decline as compared with Jan. 1955. Nevertheless, March egg production was 2% larger than a year earlier, in spite of the fact that the flocks contained an uncommonly large proportion of older hens. The replacement hatch was large and early; by October there were 1% more layers than in 1955, and all parts of the country showed record rates of lay per hen.

Egg prices declined as much as ten cents per dozen early in the year but remained above the levels of a year earlier until late spring. In October producers received an average price of 38.1 cents per dozen as compared with 42.9 cents per dozen in Oct. 1955. The poultry ration increased in price during the latter part of the year but remained slightly below 1955 levels. The usual autumnal seasonal rise in egg prices was earlier and less pronounced than in 1955 when prices to producers reached 47.1 cents per dozen. Export of shell eggs, which amounted to 50,000,000 doz. valued at \$20,000,000 in 1955, an all-time high, increased in 1956. (J. K. R.)

Egypt. A republic of northeast Africa, Egypt is bounded north by the Mediterranean, south by the Sudan, east by Israel and the Red sea, west by Libya. Area: 386,100 sq.mi. Pop.: (1947 census) 19,021,840; (1955 est.) 22,934,000. Language: 97% Arabic, with minorities speaking Greek, Italian, Armenian, etc. Religion: Moslem (mainly Sunni) 91.4%; Christian (mainly Copt) 8.19%; Jewish 0.4%. Chief towns (pop., 1947 census, 1952 estimate in parentheses): Cairo (cap.) 2,090,654 (2,367,900); Alexandria 919,024 (1,070,100); Port Said 177,703 (186,300); Tanta 139,926 (147,800); Mehalla el-Kubra 115,758 (131,000); Suez 107,244 (115,200); Mansura 101,965 (118,100). President of the republic and chief executive in 1956: Gamal Abdel Nasser.

History.—The first half of 1956 was largely taken up with preparations, procedural and psychological, for the plebiscite of June 23. Two issues were to be presented to the electors: the confirmation of Col. Gamal Abdel Nasser as president (no other candidate for the presidency was standing), and the approval of the draft constitution announced in January. This constitution purported to safeguard the basic freedoms of speech, worship, association and private ownership. It provided for a unicameral legislature and made the president both chief of state and head of the executive with a six-year term of office. Future presidents were to be nominated by the national assembly (the elected legislature) and confirmed by a popular referendum. All laws were to be approved by the national assembly, which was also to have the power to override the president's veto, to question ministers and remove them by a vote of no confidence and to impeach the president and ministers for high treason. It was to consist of 350 members and to be convened in November. Thus, on the face of it, the constitution was to be the basis of a new democratic life for Egypt, but the democracy it offered was qualified in certain important respects. Many of the paragraphs guaranteeing democratic freedoms ended with the vague phrase "as prescribed by law." Moreover, the candidates for the national assembly were to be hand-picked men, chosen by a nebulous "national union" representing all citizens and organized in a form decided upon by the president.

However, a number of measures were taken before the plebiscite to relax the dictatorship and create a certain feeling of

freedom among the electors; martial law was abolished, press censorship was lifted, a number of political detainees were released and the military junta, the Revolution Command council, was dissolved. Voting was made compulsory for men and optional for women. The results of the poll as announced on June 25 were: for Nasser 5,496,965 votes; against, 2,857; for the constitution 5,488,225; against, 10,046.

Egypt's campaign in the Arab world against Iraq and the Baghdad pact was vigorously pursued during the first half of the year. Nasser's prestige grew steadily throughout the Arab world and his influence became strongly established over Syria, Saudi Arabia and, particularly after the dismissal of Lieut. Gen. J. B. Glubb, in Jordan. In March King Saud and Shukri el-Kuwatli, the president of Syria, met Nasser in Cairo and the three affirmed their identity of views. Later in the year it was announced that Egypt, Syria and Jordan had agreed to a unified army command, to be headed by the Egyptian commander in chief. Toward the Arab league Egypt was increasingly adopting the attitude that that association had proved its bankruptcy and should be replaced by a much closer form of union between the Arab states grouped around Egypt.

In July there was an abrupt and dramatic change of scene from internal Egyptian and Egypto-Arab affairs to an international crisis of the first magnitude. The crisis began with Nasser's announcement in the second half of July that Egypt had decided to accept help from Great Britain, the United States and the International Bank for Reconstruction and Development for the execution of the Aswan dam scheme (this came after several months of uncertainty, following a reported Soviet offer to finance the building of the dam, as to whether Egypt would accept the western or the Soviet offer). No sooner had Nasser announced his decision than the U.S. secretary of state, John Foster Dulles, made a statement to the effect that the United States was no longer willing to give the help it had offered because of doubts regarding the economic soundness of the scheme and Egypt's ability to make an adequate contribution toward it. Another reason for the U.S. change of policy was said to have been that Egypt had been establishing close relations with the U.S.S.R. and had recognized Communist China. The U.S. announcement was followed by similar decisions by Great Britain and the International bank.

To this rebuff from the west Nasser replied by announcing, on July 26, that the Egyptian government had nationalized the Suez Canal company and would use the annual revenue from the canal (about £36,000,000, he said) to build the dam. Shareholders of the company would be compensated in accordance with the last closing prices for canal shares on the Paris Bourse.

Britain and France reacted with extreme vigour to the Egyptian government's action which was described in British notes of protest as an arbitrary action which constituted a serious threat to the freedom of navigation on a waterway of vital international importance. Financial measures were taken by the treasury to freeze Egyptian accounts in the United Kingdom; similar action was taken by France. On July 31 the two governments began taking military and naval measures which were described as precautionary. British and French residents were advised to leave Egypt. The U.S. government froze Egyptian government and Suez canal assets. Discussions in London between representatives of the British, French and U.S. governments resulted, on Aug. 2, in a decision to summon a conference of 24 countries to meet in London on Aug. 16 to consider the establishment of an international body or agency for the Suez canal to ensure that freedom and security of passage were preserved. The 24 countries were the following: Egypt, France, Italy, the Netherlands, Spain, Turkey, the United Kingdom, the U.S.S.R., Australia, Ceylon, Denmark, Ethiopia, the German Federal Republic,

Greece, India, Indonesia, Iran, Japan, New Zealand, Norway, Pakistan, Portugal, Sweden and the United States. They were selected because they were either parties to the 1888 convention guaranteeing freedom of passage through the canal, or because their ships represented an important proportion of the tonnage using the canal or because their geographical position gave them a special interest in it.

At the London conference, which Egypt and Greece declined to attend, the United States put forward a plan for international control of the canal. This plan, slightly amended by Pakistan, Ethiopia, Iran and Turkey, was supported by 18 nations: the five just mentioned as well as Australia, Denmark, France, the German Federal Republic, Italy, Japan, the Netherlands, New Zealand, Norway, Portugal, Spain, Sweden and the United Kingdom.

Another plan was put forward by India for the operation of the canal by Egypt, assisted by an international advisory body representing users of the canal. This was supported by the U.S.S.R., Indonesia and Ceylon.

The 18 nations supporting the majority plan decided to send a five-nation committee headed by the Australian prime minister, R. G. Menzies, to present the plan to Nasser and try to obtain his agreement to it. The committee was received by the president but he rejected the plan, taking his stand on Egypt's sovereignty and the right to nationalize what he considered to be an Egyptian company, while declaring his willingness to respect the 1888 convention and offering to negotiate on such matters as technical advice to Egypt, a "ceiling" for dues, etc.

In mid-September the British government announced that it had, in conjunction with the United States and France, decided to set up a provisional Canal Users' association which other countries would be invited to join and which, it was hoped, would prepare the way for a permanent settlement. A second conference (consisting of representatives of the same 18 countries) met in London during Sept. 19-21 to discuss this plan.

From the beginning, however, it was clear that there were serious differences between the U.S. and the Anglo-French interpretations of the functions of the association. The United States was not willing to use the association as an instrument of coercion against Egypt, whereas Britain and France wanted to use it to establish international control of the canal. However, the association was formally inaugurated on Oct. 1, when 15 of the 18 governments agreed to join it. The U.S.S.R. denounced it. India criticized it.

In the meantime, on Sept. 23, Britain and France asked the Security council of the United Nations to consider the canal dispute. Egypt forthwith brought a countercomplaint. The Security council met on Oct. 5 to consider both complaints. The debate ended on Oct. 14 when the U.S.S.R. vetoed the Anglo-French resolution asking the Security council to approve the Canal Users' association and urging Egypt to co-operate with it. During the debate Egypt made some concessions but did not concede international control.

Deadlock ensued again. Then on Oct. 29 Israeli forces launched a sudden attack on Egypt in the Gaza strip and the Sinai peninsula. On Oct. 30 Britain and France addressed an ultimatum to both sides calling on them to cease all warlike operations and withdraw their forces to a distance of ten miles from the canal, failing which, Anglo-French forces would intervene within 12 hours to stop the fighting and protect the canal. World opinion, revealed in almost every capital and at the UN headquarters, suspected that this ultimatum was a pretext to impose on Egypt the Suez solution which, in their view, Britain and France had since July desired, failing agreement, to enforce by military means. Some observers, indeed, went beyond this. To them the real issue was not the Suez canal but the survival of Nasser; the aim of Britain and France, they considered, was to over-

throw him as a dangerous leader of Arab nationalism both in North Africa and the middle east.

At an emergency meeting of the Security council held immediately after the launching of the Israeli attack, Britain and France vetoed a resolution which called upon the Israelis to withdraw to the armistice line and on all UN members to refrain from the use of force. Egypt rejected the ultimatum and the Anglo-French attack was launched. In New York, to circumvent the Security council veto, the UN general assembly itself was convened in emergency session. On Nov. 2 it passed a first resolution by 64 votes to 5 (only a two-thirds majority was required) calling for an immediate cease fire and the withdrawal of the Israelis to the armistice line. This resolution was defied by Great Britain, France and Israel. The Israelis captured the Gaza strip and pushed their advance deep into the Sinai desert. Meanwhile, after the steady bombing for several days of airfields and other targets in Egypt, Anglo-French troops began to land on Nov. 5 in and around Port Said by sea and air. A second emergency session of the UN general assembly had passed a resolution on Nov. 4 by 57 votes to none (19 abstentions) ordering an immediate cease fire and the creation of a UN police force to keep the peace between Israel and Egypt and bring about a resumption of navigation through the canal, which had been heavily blocked by the Egyptians at several points. This cease fire had been observed by all the parties concerned by midnight of Nov. 6 and the UN police force began to arrive in Egypt shortly afterward.

During the brief period of hostilities quantities of modern Soviet military equipment were captured from the Egyptian forces.

On Dec. 3 the British and French governments announced that they would withdraw their troops from the canal zone and the withdrawals began immediately. British and French salvage equipment had speedily cleared channels for shipping at the Port Said end of the canal and negotiations were opened by the UN authorities for the hiring of salvage ships and equipment to clear the remainder of the canal which was blocked with sunken ships and other obstructions. The last French and British troops re-embarked on Dec. 22. (See also IRAQ; SUDAN; SUEZ CANAL CONFLICT; UNITED NATIONS.)

(E. S. AH.)

Education.—State schools (1953-54): primary 7,492, pupils (1955-56) 1,860,819; secondary (including preparatory) 595, pupils (1955-56) 436,082; vocational 85, pupils (1955-56) 36,398. Teachers' training colleges (1953-54) 80, students 23,051. Institutions of higher education (1955-56) 5 (of which 3 state universities with 60,376 students in 1955-56), students 67,435.

Finance and Banking.—Monetary unit: Egyptian pound with an exchange rate of £E0.348 to the U.S. dollar. Budget: (1953-54 actual) revenue £E206,400,000, expenditure £E199,700,000; (1956-57 est.) balanced at £E326,000,000. Currency circulation (Dec. 1954) £E189,000,000, (Dec. 1955) £E186,100,000. Deposit money (Dec. 1954) £E170,000,000, (Dec. 1955) £E183,000,000. Gold and foreign exchange (Dec. 1954) \$746,000,000 U.S., (Dec. 1955) \$653,000,000 U.S.

Foreign Trade.—(Excluding trade with Sudan, 1955.) Imports £E194,160,000; exports £E140,100,000. Main sources of imports: U.K. 13%; other sterling area 9%; Germany 10%; Italy 8%; other continental E.P.U. (European Payments union countries) 18%; U.S. and Canada 12%; Soviet area 7%. Main destinations of exports: Soviet area 21%; France 9%; Germany 6%; Italy 5%; other continental E.P.U. 12%; U.K. 6%; other sterling area 12%; U.S. and Canada 7%. Main exports: cotton 77%; rice 5%.

Transport and Communications.—Roads (1954) 23,960 km. Motor vehicles in use (Dec. 1954): passenger (including taxis) 71,029, commercial (including buses) 20,487. Railways (1954) 5,797 km. Shipping, merchant vessels, 100 gross tons and over (July 1955) 68; total tonnage 130,571. Telephones (Jan. 1955) 141,320. Radio receiving sets (1954) 650,000.

Agriculture.—Main crops (metric tons, 1955; 1954 in parentheses): maize 1,713,000 (1,753,000); wheat 1,451,000 (1,729,000); barley 127,000 (116,000); rice 1,268,000 (1,118,000); sugar, raw value, 300,000 (262,000); broad beans 262,000 (239,000); lentils 49,000 (60,000); cotton, lint 334,000 (348,000); cottonseed 733,000 (673,000); onions (est.) 791,505 (746,415); potatoes 182,000 (225,000). Livestock (Sept. 1955): cattle 1,362,000; horses 42,000; mules 10,000; asses 927,000; sheep 1,237,000; buffaloes 1,323,000. Fish landed (1954) 23,400 metric tons.

Industry.—Production (metric tons, 1955): crude oil 1,824,000; cement 1,371,600; cotton yarn 73,080; woven cotton fabrics (70% total production) 246,000,000 m.; phosphate rock (1954) 527,000 metric tons; manganese ore (1954) 51,000 metric tons; salt (1954) 450,000 metric tons.

Eire: see IRELAND, REPUBLIC OF.

Eisenhower, Dwight D. (1890–), 34th president of the United States, was born at Denison, Tex., Oct. 14; his parents moved to Abilene, Kan., when he was a year old. He was graduated from the U.S. Military academy at West Point, N.Y., in 1915. (See also his biography in *Encyclopædia Britannica*.) In June 1942, during World War II, he was named Allied commander of the European theatre of operations and headed the invasions of North Africa and Germany that led to defeat of Italy and Germany.

After serving as chief of the army staff at the end of the war, he resigned from active service on Feb. 7, 1948, to become president of Columbia university, New York city. He was recalled to active duty in Dec. 1950 as head of the North Atlantic treaty forces in Europe. He resigned that post as of June 1, 1952, to campaign for the Republican presidential nomination. He was nominated on July 11, and with his running mate, Sen. Richard M. Nixon of California, elected on Nov. 4. He was re-elected along with Nixon on Nov. 6, 1956, in what was generally regarded as a great personal tribute, for the Democrats captured congress in the face of his electoral and popular landslide.

For a while during 1956, there were doubts that Eisenhower would be able to seek a second term because of his Sept. 1955 heart attack. But on Feb. 11, 1956, after numerous medical tests, he announced his decision to run again, adding that his physicians had given him assurance of an "active life for five or ten years." Some prominent Democrats disagreed with this verdict, and publicly deplored the fact that, if re-elected, he would be only a "part-time president."

Eisenhower's health worried Republicans again in June 1956, when he was hurriedly operated on at Walter Reed hospital for an intestinal obstruction, an ailment known as ileitis. But his physicians again pronounced his postoperative condition as excellent, and doubted that there would be any serious recurrences. On the weekend before election, he underwent a two-day medical examination, and on Oct. 28 his physicians reported in an unprecedented and detailed diagnosis that "he gives every appearance of being in excellent health." There arose again in the press a politico-medical controversy over his capacity to perform his full presidential duties, and this issue was injected into the re-election contest, but without any evident effect.

Eisenhower returned to the White House in mid-July after a two weeks' rest at his Gettysburg (Pa.) farm. From July 21 to 23 he attended a conference of American presidents in Panamá, and showed no ill effects from his exertions.

Eisenhower was relatively successful in dealing with a Democratic congress, largely because he eschewed bitter personal or political controversy. His request of \$4,300,000,000 for foreign aid was cut to \$4,100,000,000, a compromise which he accepted. Besides providing \$41,500,000,000 for national defense, congressional Democrats forced an additional \$900,000,000 on him for heavy bombers.

He vetoed a Democratic farm bill because it provided for rigid 90% price supports, but congress passed his measure for lower and flexible payments. He obtained a \$33,000,000,000 highway construction program. There was no action on his five year, \$2,000,000,000 school building project because of northern Democrats' insistence that federal funds be withheld from communities which failed to abolish segregation.

He accepted two Democratic proposals. Although he favoured raising the hourly minimum wage from 75 to 90 cents, he approved the opposition's \$1 figure. He also agreed to their amendments lowering to 62 years the age at which women become eligible for Social Security benefits, and to 50 the age when totally disabled persons may collect federal payments. Although he approved its basic principle, he vetoed a natural gas act relieving that industry of federal control because of the questionable be-



MRS. DWIGHT D. EISENHOWER AND SON, Maj. John Eisenhower, arriving at Walter Reed Army hospital, Washington, D.C., after learning of President Eisenhower's attack of ileitis in June 1956

haviour of the "natural gas lobby."

On foreign affairs, Eisenhower sought to cement the free world against the Communist menace. He rejected Soviet Premier N. A. Bulganin's proposal for a 20-year peace treaty because of the postwar failure of the U.S.S.R. to keep previous promises. After a visit from British Prime Minister Anthony Eden in February, the two issued a communiqué reaffirming U.S.-British belief in the "self-determination of peoples." They also cautioned free nations against reliance on the U.S.S.R. for economic or political aid lest they mortgage their independence. Other foreign visitors in 1956 included Pres. John Costello of Ireland, Pres. Giovanni Gronchi of Italy, Pres. Sukarno of Indonesia, Chancellor Konrad Adenauer of Germany and numerous South American statesmen.

Eisenhower proposed to Bulganin that the U.S. and U.S.S.R. join in ending production of nuclear weapons for war, but without success because of Soviet opposition to an international inspection system. But at the year's end 82 nations had agreed to the president's earlier proposal for an international atomic pool devoted to peacetime use.

Eisenhower gave considerable thought to improving relations with western hemisphere neighbours. In March he spent several days at White Sulphur Springs, W. Va., in informal conferences with Pres. Ruis Cortines of Mexico and Canadian Prime Minister Louis Stephen St. Laurent. At the Panamá conference in July he urged the "beneficial use of nuclear forces for peaceful purposes throughout the Western Hemisphere." With the other American presidents, he signed a "declaration of ideals" which advocated devotion to freedom, opposition to totalitarianism and full economic development of the western hemisphere resources.

In accepting renomination at San Francisco, Calif., Eisenhower pledged that the G.O.P. would be "the party of the future," and

he waged his campaign on that basis. He again declared his purpose of "liberalizing" and "modernizing" it. His principal appeal to the voters was that his administration had brought "peace, progress and prosperity" without war activities or expenditures. He stressed the fact that he had ended the Korean conflict, and had emerged from such crises as those in Indochina and Formosa, the Israeli-Arab dispute and Suez canal controversy without war.

He also emphasized that national income, wages, employment and other economic indexes were at a record figure. Travelling more extensively and speaking more frequently than he had originally intended, on television and in countryside appearances, he proved to the people and politicians that he was far more popular than the party he headed.

Eisenhower undoubtedly benefited from overseas events in the closing weeks of the campaign. He sponsored United Nations resolutions condemning the U.S.S.R.'s brutal behaviour in Poland and Hungary. He expressed his firm disagreement with Israel and the major U.S. allies in Europe, Britain and France, when they invaded Egypt. He promised that there would be "no American involvement" in that conflict. He characterized Adlai E. Stevenson's proposal to end the draft and H-bomb tests as "incredible folly."

In accord with his relaxed routine, the president spent many weekends at his Gettysburg farm with other short visits to his Augusta Country Club cottage and to Sec. George M. Humphrey's Georgia plantation, where he fished and hunted.

The only important changes in his official family during the year were the substitution of former Sen. Fred A. Seaton of Nebraska for Douglas McKay of Oregon as Secretary of the Interior, and the appointment of Justice William J. Brennan, a New Jersey Democrat, to the supreme court. He succeeded Justice Sherman Minton of Indiana, who resigned because of ill health. (See also ELECTIONS, U.S.; POLITICAL PARTIES, U.S.; UNITED STATES.) (R. TU.)

Eisenhower, Milton Stover (1899–), U.S. educator, brother of Pres. Dwight D. Eisenhower and one of the latter's closest advisers, was born at Abilene, Kan., on Sept. 15. He took his bachelor's degree at Kansas State college in 1924. While in college he was city editor of the *Abilene Daily Reflector*, and after graduation was for a time assistant professor of journalism at Kansas State college.

Eisenhower was U.S. vice-consul at Edinburgh, Scot., 1924–26, after which he served in a series of government posts—assistant Secretary of Agriculture William M. Jardine in the Coolidge administration; public relations director of the department of agriculture, 1928–40; land use co-ordinator, 1937–42; director of the War Relocation authority, 1942; and associate director of the office of war information, 1942–43. From 1943 to 1950 he was president of Kansas State college, then for the next six years president of Pennsylvania State university; in 1956 he was named president of Johns Hopkins university. He also served on a number of official and semiofficial federal commissions and boards, and from 1953 was President Eisenhower's personal representative for Latin-American affairs; in the summer of that year he made an extensive tour of South America as a special presidential envoy.

Elections, U.S. Pres. Dwight D. Eisenhower rolled up an unprecedented total of about 35,500,000 votes to win a second and final term in the presidency in the Nov. 1956 elections. Automatically elected with him was Vice-Pres. Richard M. Nixon. Defeated by about 9,500,000 votes, Adlai E. Stevenson, the Democratic nominee, and his vice-presidential running

mate, Sen. Estes Kefauver of Tennessee, carried only seven states.

In carrying 41 states, including several in the south and the political border areas, Eisenhower received 457 electoral votes, 191 more than the 266 needed for election. Stevenson got a total of 73¹ from the seven states he carried—Alabama, Arkansas, Georgia, Mississippi, Missouri, North Carolina and South Carolina. It was the worst defeat for a presidential candidate since Franklin D. Roosevelt's 523-to-8 electoral vote landslide over Republican Alfred M. Landon of Kansas in 1936.

Riding a wave of personal popularity that carried into every corner of the country, Eisenhower won about 57% of the two-party vote for president. This compared with the 55.4% of the vote he got against Stevenson in 1952 when Eisenhower won 15 fewer electoral votes.

But despite the president's tremendous political sweep, Democrats retained control of congress and gained a net of two governorships in 30 ballot contests, including that in Maine in September when Democratic Gov. Edmund S. Muskie won re-election. The 1956 election results provided the first instance since 1848 that a president had not carried his party along with him to control of at least one of the houses.

In the Nov. 1956 voting, Democrats retained numerical control of the senate by the same margin they had had in the 84th congress, 49 Democrats to 47 Republicans. Sen. Lyndon B. Johnson of Texas, the Democratic majority leader, had predicted that his party would retain control of the body, despite some indications that Republicans might benefit by absences of members when the organization test came or might gain strength through the resignation from the senate of Sen. Price Daniel to become governor of Texas in Jan. 1957.

The party standoff in the election came through the exchange of eight contested seats. Democrats took over Republican senate

Table I.—Senators Elected by States, 1956

Alabama	Democrat	*Lister Hill
Arizona	Democrat	*Carl Hayden
Arkansas	Democrat	*James W. Fulbright
California	Republican	*Thomas H. Kuchel
Colorado	Democrat	John A. Carroll
Connecticut	Republican	*Prescott Bush
Florida	Democrat	*George A. Smathers
Georgia	Democrat	Herman E. Talmadge
Idaho	Democrat	Frank Church
Illinois	Republican	*Everett M. Dirksen
Indiana	Republican	*Homer E. Capehart
Iowa	Republican	*Bourke B. Hickenlooper
Kansas	Republican	*Frank Carlson
Kentucky	Republican	John S. Cooper (short term)
Louisiana	Democrat	Thurston B. Morton
Maryland	Republican	*Russell B. Long
Missouri	Democrat	*John M. Butler
Nevada	Democrat	*Thomas C. Hennings, Jr.
New Hampshire	Republican	*Alan Bible
New York	Republican	*Norris Cotton
North Carolina	Democrat	Jacob K. Javits
North Dakota	Republican	*Sam J. Ervin, Jr.
Ohio	Democrat	*Milton R. Young
Oklahoma	Democrat	Frank J. Lausche
Oregon	Democrat	*A. S. Mike Monroney
Pennsylvania	Democrat	*Wayne Morse
South Carolina	Democrat	Joseph Clark, Jr.
South Dakota	Republican	J. Strom Thurmond (short term)
Utah	Republican	*Olin D. Johnston
Vermont	Republican	*Francis Case
Washington	Democrat	*Wallace F. Bennett
West Virginia	Republican	*George D. Aiken
Wisconsin	Republican	*Warren G. Magnuson
		Chapman Revercomb
		*Alexander Wiley

*Re-elected.

seats in Ohio, Idaho, Pennsylvania and Colorado, defeating Republican incumbents in all except Colorado, where Sen. Eugene Millikin had retired in favour of another G.O.P. nominee, former Gov. Dan Thornton. Aided in some instances by Eisenhower's landslide, Republicans captured Democratic seats in New York, West Virginia and two in Kentucky.

Including vacancies caused by deaths and resignations, there were 35 senate seats at stake in 33 states in the November voting. South Carolina and Kentucky each filled two seats, and

¹ One of Alabama's 11 electoral voters cast his vote for Walter B. Jones of Montgomery, Ala.

NINETY-SIX YEARS OF PRESIDENTIAL ELECTIONS

Electoral Vote by States for 1956		1860	1864	1868	1872	1876	1880	1884	1888	1892	1896	1900	1904	1908	1912	1916	1920	1924	1928	1932	1936	1940	1944	1948	1952	1956	
11	ALABAMA	9	No vote	8	10	10	10	10	10	11	11	11	11	11	12	12	12	12	12	12	11	11	11	11	11	110	
4	ARIZONA	ADMITTED 1912																									
8	ARKANSAS	4	No vote	5	6	6	6	7	7	8	8	8	9	9	9	9	9	9	9	9	9	9	9	9	8	8	
32	CALIFORNIA	4	5	5	6	15	8	8	18	18	18	9	10	10	21	13	13	13	13	22	22	22	25	25	32	32	
6	COLORADO	ADMITTED 1876																									
8	CONNECTICUT	6	6	6	6	6	6	6	6	6	6	6	7	7	7	7	7	7	7	8	8	8	8	8	8	8	
3	DELAWARE	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	
10	FLORIDA	3	No vote	3	4	4	4	4	4	4	4	4	5	5	6	6	6	6	6	6	7	7	7	8	8	10	
12	GEORGIA	10	No vote	9	8	11	11	12	12	13	13	13	13	13	14	14	14	14	14	14	12	12	12	12	12	12	
4	IDAHO	ADMITTED 1890																									
27	ILLINOIS	11	16	16	21	21	21	22	22	24	24	24	27	27	29	29	29	29	29	29	29	29	28	28	27	27	
13	INDIANA	13	13	13	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	14	14	14	13	13	13	
10	IOWA	4	8	8	11	11	11	13	13	13	13	13	13	13	13	13	13	13	13	13	11	11	11	10	10	10	
8	KANSAS	ADMITTED 1861	3	3	5	5	5	9	9	10	10	10	10	10	10	10	10	10	10	10	9	9	8	8	8	8	
10	KENTUCKY	12	11	11	12	12	12	13	13	13	12	13	13	13	13	13	13	13	13	13	11	11	11	11	10	10	
10	LOUISIANA	6	No vote	7	8	8	8	8	8	8	8	8	9	9	10	10	10	10	10	10	10	10	10	10	10	10	
5	MAINE	8	7	7	7	7	7	6	6	6	6	6	6	6	6	6	6	6	6	6	5	5	5	5	5	5	
9	MARYLAND	8	7	7	8	8	8	8	8	8	8	8	17	26	8	8	8	8	8	8	8	8	8	8	9	9	
16	MASSACHUSETTS	13	12	12	13	13	13	14	14	15	15	15	16	16	18	18	18	18	18	17	17	17	16	16	16	16	
20	MICHIGAN	6	8	8	11	11	11	13	13	15	14	14	14	14	15	15	15	15	15	19	19	19	19	19	20	20	
11	MINNESOTA	4	4	4	5	5	5	7	7	9	9	9	11	11	12	12	12	12	12	11	11	11	11	11	11	11	
8	MISSISSIPPI	7	No vote	8	8	8	8	9	9	9	9	9	10	10	10	10	10	10	10	9	9	9	9	9	8	8	
13	MISSOURI	9	11	11	15	15	15	16	16	17	17	17	18	18	18	18	18	18	18	15	15	15	15	15	13	13	
4	MONTANA	ADMITTED 1889																									
6	NEBRASKA	ADMITTED 1867	3	3	3	3	3	3	3	3	3	3	3	3	4	4	4	4	4	4	4	4	4	4	4	6	

West Virginia filled one out of the regular order because of the death of Democratic Sen. Harley M. Kilgore. Of the total of 35, Democrats had held 18 seats and the Republicans 17. Demo-

Table II.—Party Distribution in the House of Representatives by States, Resulting From the 1956 Election

State	Democrats	Republicans	State	Democrats	Republicans
Alabama	9	0	Nebraska	0	4
Arizona	1	1	Nevada	1	0
Arkansas	6	0	New Hampshire	0	2
California	13	17	New Jersey	4	10
Colorado	2	2	New Mexico	2	0
Connecticut	0	1	New York	17	26
Delaware	7	1	North Carolina	11	1
Florida	10	0	North Dakota	0	2
Georgia	1	1	Ohio	6	17
Idaho	11	14	Oklahoma	5	1
Illinois	2	9	Oregon	3	1
Indiana	1	7	Pennsylvania	13	17
Iowa	1	5	Rhode Island	2	0
Kansas	6	2	South Carolina	6	0
Kentucky	8	0	South Dakota	1	1
Louisiana	1	2*	Tennessee	7	2
Maine	4	3	Texas	21	1
Maryland	7	7	Utah	0	2
Massachusetts	6	12	Vermont	0	1
Michigan	5	4	Virginia	8	2
Minnesota	6	0	Washington	1	6
Mississippi	10	1	West Virginia	4	2
Missouri	2	0	Wisconsin	3	7
Montana			Wyoming	0	1
			Totals	234	201*

*One seat contested.

cratic nominees were unopposed in the general election in five states in the south.

Despite the Eisenhower avalanche that rolled over 41 states, Democrats increased their strength in the house of representatives. In the preceding congress the house had been divided 230 Democrats, 201 Republicans and 4 vacancies, of which each party had held two. In the November balloting, Democrats elected 234 members, one of whom died immediately after the election. The Republicans elected 201 members, one of whose seat was being contested at the end of the year in Maine. This gave the Democrats a slightly greater working majority, with some shift in their strength from the big industrial states, where they lost some seats to the Republicans, toward the agricultural midwest and the natural-resources-conscious far west.

The division of strength in the new house is shown in Table II.

Table III.—Governors Elected by States, 1956

Arizona	Democrat	*Ernest W. McFarland
Arkansas	Democrat	*Orval Faubus
Colorado	Democrat	Stephen L. R. McNichols
Delaware	Republican	*J. Caleb Boggs
Florida	Democrat	*LeRoy Collins
Illinois	Republican	*William G. Stratton
Indiana	Republican	Harold W. Handley
Iowa	Democrat	Herschel C. Loveless
Kansas	Democrat	George Docking
Maine	Democrat	*Edmund S. Muskie
Massachusetts	Democrat	Foster Furcolo
Michigan	Democrat	*G. Mennen Williams
Minnesota	Democrat	*Orville L. Freeman
Missouri	Democrat	James T. Blair, Jr.
Montana	Republican	*J. Hugo Aronson
Nebraska	Republican	*Victor E. Anderson
New Hampshire	Republican	*Lane Dwinell
New Mexico	Republican	Edwin L. Mechem
North Carolina	Democrat	*Luther H. Hodges
North Dakota	Republican	John E. Davis
Ohio	Republican	C. William O'Neill
Oregon	Democrat	Robert D. Holmes
Rhode Island	Democrat	*Dennis J. Roberts
South Dakota	Republican	*Joe Foss
Texas	Democrat	Price Daniel
Utah	Republican	George D. Clyde
Vermont	Republican	*Joseph B. Johnson
Washington	Democrat	Albert D. Rosellini
West Virginia	Republican	Cecil H. Underwood
Wisconsin	Republican	Vernon W. Thomson

*Incumbent.

In the gubernatorial contests, the Democrats increased from 27 to 29 their dominance of the statehouses. Republicans, who had held 21 governor's posts, wound up with 19.

Democrats replaced Republican governors in Iowa, Kansas, Massachusetts, Oregon and Washington. Republicans ousted Democrats in New Mexico, Ohio and West Virginia. In the other states, either governors were re-elected or members of their own party succeeded them.

Although there were a number of tickets entered, the outcome

of the presidential race was unexpected only in the extent of President Eisenhower's margin over Stevenson. Only in South Carolina did a third-party ticket have any measurable effect on the outcome. In that state, an independent slate which endorsed Democratic Sen. Harry F. Byrd of Virginia polled sufficient votes so that Stevenson won the state by a plurality rather than by a majority of the votes cast.

In all, there were eight presidential and vice-presidential tickets on the ballot in various states. In addition, the Greenback party depended on write-in votes, and independent groups endorsed Byrd in Kentucky and Mississippi, as well as in South Carolina.

The presidential and vice-presidential tickets were these:

Republican—Dwight D. Eisenhower of Pennsylvania and Richard M. Nixon of California.

Democratic—Adlai E. Stevenson of Illinois and Sen. Estes Kefauver of Tennessee.

States' Rights—T. Coleman Andrews of Virginia and Thomas H. Werdell of California.

Prohibition—Enoch A. Holtwick of Illinois and Herbert C. Holdridge of California.

Socialist—Darlington Hoopes of Pennsylvania and Samuel H. Friedman of New York.

Socialist Labor—Eric Hass of New York and Georgia Cozzini of Wisconsin.

Socialist Workers—Farrell Dobbs of New York and Myra Tanner Weiss of New York.

Poor Man's—Henry Krajewski of New Jersey and Ann Marie Yezo of New Jersey.

Greenback—Fred C. Proehl of Washington and Edward Kirby Meador of Massachusetts.

Democrats built their presidential campaign primarily on two assumptions: that they could hold what once was the solidly Democratic south, and that local Democratic strength elsewhere would be sufficient to overcome the admitted popularity of Eisenhower. They felt that the U.S. voter would give much more weight than he evidently did to the fact that Eisenhower had suffered a heart attack on Sept. 24, 1955, and had undergone a serious abdominal operation on June 9, 1956.

Instead of solidifying behind Stevenson, the south broke wider apart for Eisenhower than it had done in 1952. As he had four years previously, the president carried Florida, Tennessee, Virginia and Texas. In the November balloting he added Louisiana to his list of southern conquests. In the political border states, Eisenhower added Kentucky and West Virginia to Oklahoma, which he had won in 1952.

Stevenson was able to reverse the results of 1952 in only one state, Missouri. There former Pres. Harry S. Truman, who fought Stevenson's nomination at the party's Chicago convention, said that despite the adverse results his party's nominee had made "a good campaign, much better in every way than in 1952." Truman saw the Democrats' retention of congressional control as a sign that the nation was still Democratic.

There was no serious dispute of this contention from the Republican strategists, despite the president's far-reaching victory. They conceded that Eisenhower had won re-election primarily on personal popularity, plus the impetus given his candidacy by the explosive events in the middle east in the week before the election.

Sen. Lyndon B. Johnson of Texas, the senate Democratic leader, said that "the people rallied around the president in a time of crisis, as they always do." On the other hand, Johnson said that "the record of the Democratic congress is popular and the people don't want to change parties in congress." Clayton Fritchey, Stevenson's press secretary, said that there was a "prevailing belief that this [presidential contest] was a horse race until this [middle east] foreign policy crisis arose." The net effect seemed to be that, while Stevenson had charged the Eisenhower administration had blundered its way into a bad mess in the middle east, when the crisis arose the voters turned to Eisenhower rather than to Stevenson.

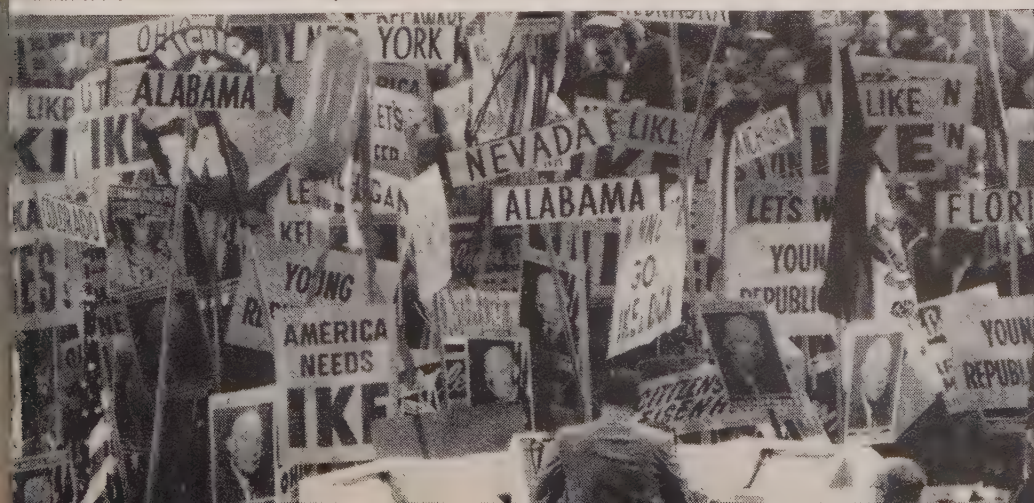


Above: CLOUD OF BALLOONS released at Republican national convention, San Francisco, Calif., Aug. 23, 1956, as delegates greeted party nominee, Pres. Dwight D. Eisenhower

Below: JOE SMITHS of the Democratic party gathered at Harrisburg, Pa., for campaign rally Sept. 13. "Joe Smith" was a fictitious Republican proposed as a vice-presidential candidate at the Republican national convention



Below: BANNERS FOR IKE going up at Republican convention after President Eisenhower's name was placed in nomination. Convention chairman Joseph Martin is shown at the rostrum



Above: DEMOCRATIC LEADERS greeting the convention at Chicago, Ill., Aug. 17. From left to right, former president Harry S. Truman, presidential nominee Adlai E. Stevenson, Gov. Averell Harriman of New York and Sen. Estes Kefauver of Tennessee, vice-presidential candidate



Above: REPUBLICAN CAMPAIGN was aided by a Florida yachtsman who suspended a photograph of President Eisenhower alongside his mainsail and attached the words "I Like Ike" to his jib and mizzen

Below: REP. JOHN W. McCORMACK, chairman of the Democratic party platform committee, urging convention to adopt compromise civil rights program



Eisenhower said in an election-night victory statement that the results represented a victory for the principles for which his administration stood, rather than for himself as an individual. He said the vote proved that the people approved of what he called "modern Republicanism"—a view that few politicians seemed to share.

Although he had set out to refashion his party and to elect Republicans who shared his "moderate progressive" views, Eisenhower had no signal success in attaining this objective in a 13,614-mi. campaign that took him into 13 pivotal states. He campaigned in California, Colorado, Florida, Illinois, Iowa, Kentucky, Minnesota, New York, Ohio, Oregon, Pennsylvania, Virginia and Washington. Because he thought "barnstorming" and "whistle-stopping" beneath the dignity of a president, Eisenhower cut his campaign far short of the 51,000-mi. range in which he visited 45 states in 1952.

Everywhere he went the president drew large crowds which cheered his famous grin and his upraised arms. But, as in the experience of some presidents before him, Eisenhower found that his popularity did not rub off on other Republican candidates.

Despite his efforts in their behalf, the Republican senators George H. Bender of Ohio, Herman Welker of Idaho and James H. Duff of Pennsylvania met defeat. A frequent presidential golfing partner, former Gov. Dan Thornton of Colorado, was beaten in his try for a senate seat. Two of the president's hand-picked senatorial candidates also were rejected by the voters. They were former Secretary of the Interior Douglas McKay, beaten in Oregon by Democratic Sen. Wayne Morse; and Gov. Arthur B. Langlie, who failed to beat Democratic Sen. Warren G. Magnuson in Washington.

Eisenhower had some success in this field, however. His 1,500,000-vote margin in New York state helped elect the state attorney general, Jacob K. Javits, to the senate over his Democratic rival, Mayor Robert F. Wagner, Jr., of New York city. In Kentucky Eisenhower's margin over Stevenson helped bring into the senate two Republicans—John Sherman Cooper, former ambassador to India and a former senator, and Thruston B. Morton, former assistant secretary of state and a former member of the house of representatives.

Stevenson, who travelled 37,619 mi. through 32 states in the campaign, carried the attack to Eisenhower on the "part-time president" issue. The Democratic nominee also was extremely critical of the G.O.P. administration's foreign policies. At the close of the campaign, he summed up the presidential health issue with the declaration that Eisenhower "has never had the inclination and now lacks the energy for full-time work at the world's toughest job."

Stevenson's two principal proposals in the campaign—both criticized severely by Eisenhower—were that the United States move toward the abolition of hydrogen bomb tests and that it reassess its military manpower needs with the idea of eliminating the draft. Neither appeared to have caught on as an issue among voters likely to consider the five-star general president the top authority on such questions.

Early in the campaign, Stevenson appealed for the Democratic vote with a program for what he called the "new America." He attacked the tight money policies of the Eisenhower administration and said that small businessmen were being squeezed and the farmer betrayed while the G.O.P. was pampering big business. He criticized what he called Eisenhower's failure to provide leadership in the fields of civil rights, school construction and social security advances.

But Stevenson's primary contention was that there was no real peace in the world. He said that the prestige of the United States abroad had dropped to a low point, that Eisenhower and Secretary of State John Foster Dulles either did not know what

was going on in the world or were withholding the truth from the American people.

Eisenhower generally maintained a restrained attitude toward his rival's charges. The president never mentioned Stevenson by

Table IV.—The Vote for President by States, 1952

State	Republican	Popular vote		Electoral vote	
		Republican	Democratic	Other	Republican
Alabama*	194,883	279,982	20,147	—	10*
Arizona	176,990	112,880	303	4	—
Arkansas	186,287	213,277	7,008	—	8
California	3,027,668	2,420,135	17,902	32	—
Colorado	394,479	263,997	4,598	6	—
Connecticut	711,837	405,079	205	8	—
Delaware	98,057	79,421	510	3	—
Florida	643,849	480,371	1,481	10	—
Georgia†	222,874	445,925	2,185	—	12
Idaho	166,979	105,868	126	4	—
Illinois	2,623,327	1,775,682	8,342	27	—
Indiana	1,182,811	783,908	7,888	13	—
Iowa	729,187	501,858	3,535	10	—
Kansas	566,878	296,317	3,048	8	—
Kentucky	572,192	476,453	5,160	10	—
Louisiana	329,047	243,977	44,520	—	—
Maine	249,238	102,468	—	5	—
Maryland	559,737	372,603	177	9	—
Massachusetts	1,393,197	948,190	7,119	16	—
Michigan	1,713,647	1,359,898	6,923	20	—
Minnesota	719,302	617,525	3,178	11	—
Mississippi	56,372	144,498	47,279	—	8
Missouri	914,486	919,187	—	13	—
Montana	154,933	116,238	—	4	—
Nebraska	378,108	199,029	—	6	—
Nevada	56,049	40,640	—	3	—
New Hampshire	176,519	90,364	134	4	—
New Jersey	1,606,942	850,337	27,033	16	—
New Mexico	146,778	106,098	1,040	4	—
New York§	4,340,340	2,750,769	2,307	45	—
North Carolina	575,062	590,530	—	14	—
North Dakota	156,766	96,742	483	4	—
Ohio	2,262,610	1,439,655	—	25	—
Oklahoma	473,769	385,581	—	8	—
Oregon	406,393	329,204	289	6	—
Pennsylvania	2,585,252	1,981,769	9,974	32	—
Rhode Island	229,677	163,521	—	4	—
South Carolina	75,513	137,820	88,346	—	8
South Dakota	171,569	122,288	—	4	—
Tennessee	462,288	456,507	20,609	11	—
Texas	1,080,619	859,958	14,968	24	—
Utah	215,631	118,364	—	4	—
Vermont	110,390	42,549	39	3	—
Virginia	386,459	267,760	43,759	12	—
Washington	620,430	523,002	7,457	9	—
West Virginia	449,297	381,534	—	8	—
Wisconsin	954,844	586,768	8,946	12	—
Wyoming	74,573	49,554	72	3	—
Total	35,584,135	26,036,080	417,090	457	73*

*One of Alabama's 11 electors cast his vote for Walter B. Jones, of Montgomery, Ala. †Ticket splitting caused much confusion. Many voters marked some individual elector candidates and not others on the same slate, and the secretary of state's office certified only consolidated county returns. These showed Stevenson 441,094, Eisenhower 416,652. However, using the highest vote for individual electors in five counties listing no total vote for Stevenson or Eisenhower, the figures show Stevenson 445,925, Eisenhower 222,874. The complicated ballot in Georgia lists names of presidential nominees plus those of 12 electors for each party.

‡Republican figure of 56,372 was for Mississippi Republican party or "Lily White" electors for Eisenhower. A separate Eisenhower slate under the Grand Old Party or "Black and Tan" label polled 4,313. Since the two cannot be combined, the latter figure is placed in the "Other" column along with 42,966 States' Rights ticket votes.

§Democratic vote includes 292,557 Liberal party votes for Stevenson.

Source: Associated Press.

name during the campaign. A few times he lashed out in reply to accusations that had been made against him, once calling Stevenson's charges "wicked nonsense." If he was supremely confident of his own re-election throughout the campaign, as he appeared to be, Eisenhower seemed to have been justified by the results. Likewise, his confident running mate, Vice-President Nixon, shared in the overwhelming verdict that returned both to second terms.

Nixon had been designated by the Republican national chairman, Leonard W. Hall, as the work horse of the G.O.P. campaign. The vice-president, more restrained and consequently less controversial than he had been in the 1952 and 1954 campaigns, topped the 34,000-mi. mark in his travels. His principal thesis was that "the people are happy because they are getting the kind of government they want." He added that what the people really wanted was a "government that can keep the peace."

Senator Kefauver shook uncounted thousands of hands in a campaign tour that took him, by his own calculation, the equivalent of 2½ times around the world. Although it had many variations, Kefauver's main theme was that the Democratic party was more interested in the individual than was the Republican party.

Whether all of the appeals, by television or in person, altered many votes remained a matter of conjecture. But the fact was that, no matter how he did it, Eisenhower's vote was very large in many states where such a result had not been expected. The final Associated Press tabulation of the official vote by states is shown in Table IV.

(See also DEMOCRACY; POLITICAL PARTIES, U.S.; UNITED STATES CONGRESS; and under various states.) (J. L. BE.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Political Parties* (1952); *Presidential Elections* (1952); *Pressure Groups* (1952); *Public Opinion* (1946).

Electrical Industries. Sales of energy by electric utilities in the United States rose 10.0% during 1956 to a total of 529,600,000,000 kw.hr. Industry was the largest user, consuming 355,400,000,000 kw.hr. Of this amount, 274,900,000,000 kw.hr. was purchased from utilities and 80,500,000,000 kw.hr. was generated by industrial plants for their own use. The 274,900,000,000 kw.hr. purchased by industry was 51.9% of all the energy sold by utilities.

During 1956 the use of electric energy in manufacturing reached 228,400,000,000 kw.hr., a 4.5% increase over the previous year. Added to manufacturing consumption was the purchase of 58,500,000,000 kw.hr. for use by Atomic Energy commission installations. This was more than four times the amount purchased by the AEC in 1953. Other industries, including aluminum and magnesium, used 68,500,000,000 kw.hr. The 228,400,000,000 kw.hr. used by manufacturing, 58,500,000,000 kw.hr. by the AEC and 68,500,000,000 kw.hr. by other industries made up the total industrial use of 355,400,000,000 kw.hr.

Sales to Residential Customers.—During 1956 the use of energy by the average residential customer showed a record increase of 244 kw.hr. This brought consumption by the average customer to 2,995 kw.hr. per year. Electric utilities also added 1,200,000 new residential customers during the year, bringing the total number of customers to 45,600,000. These 45,600,000 customers purchased 134,800,000,000 kw.hr., an increase of 12.0% over 1955 and representing 25.5% of all the energy sold by the electric utilities. The customers paid an average of 2.60 cents per kilowatt-hour for this energy, and at this price the average customer's use of 2,995 kw.hr. cost him \$77.87. The total cost of the energy used by all residential customers amounted to \$3,504,000,000.

Sales to Commerce.—Sales of energy to customers classified as small light and power showed a 10.0% gain during 1956. This again brought the total use by commercial establishments to 88,400,000,000 kw.hr., or 16.7% of the total sold by utilities. Air conditioning of office buildings and commercial establishments was a prime cause of the increase, although other factors such as lighting and commercial cooking also contributed to it.

Sales to other less important classifications, 5.9% of the total, rose 3.3% to 31,400,000,000 kw.hr. during 1956. The increase of 10.2% in industrial sales, 12.0% in residential, 10.0% in commercial and 3.3% to other classifications brought total sales to 29,600,000,000 kw.hr., and the total gain over 1955 sales to 10.0%. To meet this demand for energy the nation's major electric utilities (classified as class I electric systems) made available 600,300,000,000 kw.hr. To do this they used 122,000,000 kw. of generating capacity. This equipment experienced a non-coincident peak load of 106,700,000 kw. As a result these systems showed a gross margin (generating capability over peak load) of 15,300,000 kw., or 14.4% of peak load.

Private companies owned approximately 80% of the nation's generating capacity. Ownership of the remaining capacity was divided among rural electric co-operatives, municipalities, public power districts, state agencies and the federal government.

Electrical Manufacturing.—Manufacture of heavy electric

power equipment continued at a high rate during 1956. Although deliveries of steel, particularly heavy plate, lengthened, no serious problems were created. Copper, on the other hand, was in short supply earlier in the year and as a result its price rose drastically. Later in the year price declined as supplies improved. Production manpower was ample but a shortage of technical and engineering talent threatened to become a bottleneck.

The production of electric generating equipment both thermal and hydraulic scheduled for shipment during 1956 was about 9,100,000 kw. A lengthy strike at one of the major manufacturers delayed production of many units. Of the equipment produced, 7,800,000 kw. was scheduled for shipment to U.S. electric power systems. The remainder was scheduled for export or for U.S. industrial plants. Of the 9,100,000 kw. scheduled for shipment nearly 8,000,000 kw. was thermal. The remaining 1,100,000 kw. were hydraulic turbine generators.

Steam generators (450 lb. per square inch pressure and higher) capable of delivering almost 91,000,000 lb. of steam per hour, were scheduled for shipment in 1956.

Late in 1956, nine nuclear power plants of 10,000 kw. or larger were moving forward beyond the development stage. These had an aggregate capacity of more than 1,000,000 kw. All of these projects were of a developmental character and it was not expected that these first installations would produce power at a cost less than the cost of production in modern thermal plants. It was expected that these projects would, however, contribute materially to the technology of atomic reactor design. Experience gained would permit ultimate development of nuclear power plants which would be competitive with conventional plants.

The production of nearly 60,000,000 kva. of power transformer capacity in 1954 was the highest on record. Production for 1955 was only 44,000,000 kva. During 1956 scheduled shipments rose to 58,000,000 kva.

Appliance Sales.—Sales of electrical appliances during 1956 were generally slightly below those of 1955. During the first eight months of 1956 manufacturers of electric refrigerators sold nearly 2,600,000 units. Sales during the same period in 1955 totalled 2,900,000 units.

During the first eight months of 1956 about 4,400,000 television sets were sold. Total sales during the same period in 1955 amounted to 4,800,000 units.

Sales of electric ranges during the first eight months of 1956 were 970,000 units. Of these 190,000 were "built-in's." Sales during the first eight months of 1955 were 977,000. Of these, only 98,000 were "built-in's." Washing machine sales during the first nine months of 1956 totalled 2,469,000, an increase of 8.8% over the same period in 1955, and sales of electric clothes dryers during the first nine months of 1956 were 776,000 units, a 16.2% increase over the same period in 1955 when manufacturers sold 688,000.

During 1956 retail sales of air conditioners amounted to 1,600,000 units as compared with 1,290,000 units during 1955.

(See also FEDERAL POWER COMMISSION; PUBLIC UTILITIES; RURAL ELECTRIFICATION ADMINISTRATION; TENNESSEE VALLEY AUTHORITY.) (AR. Mo.)

Canada.—During 1955, 804,000 kw. of new generating capacity was brought into operation in Canada, raising the total to 13,905,000 kw. Hydro generation accounted for 12,150,000 kw. and thermal generation for 1,753,000 kw. The steady growth of thermal capacity had been a significant development of recent years. In 1950 thermal generation accounted for only 641,000 kw. or 7% of the total, while in 1955 it accounted for 12.6% of the total. Of a total generating capacity of 19,339,000 kw. contemplated by 1959, 2,981,000 kw. or 15.4% would be thermal generated. Of the presently developed generated capacity, 40%

was located in the province of Quebec, 32% in Ontario and 12% in British Columbia.

Firm energy requirements in 1955 were 72,603,000,000 kw.hr. against 65,978,000,000 kw.hr. in 1954. Requirements for 1959 were estimated at 101,508,000,000 kw.hr.

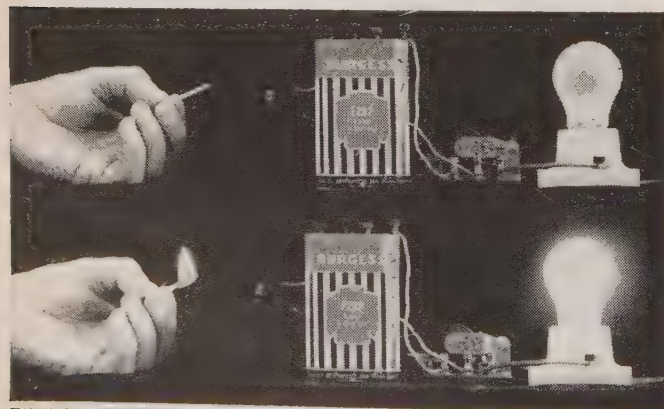
Major new developments under construction during 1956 included the joint Canadian-U.S. St. Lawrence river project (600,000 kw. for Canada) built in conjunction with the St. Lawrence seaway; the Bersimis river project in Quebec, which upon completion would provide 1,500,000 kw.; a program of the Aluminum Company of Canada which would result in the installation of an additional 450,000 h.p. in British Columbia, and of 1,000,000 h.p. on the Upper Peribonka river in Quebec, the first power to become available in 1959. Two gigantic power sites in Canada's north country, the "North West Power" project in the Yukon Territory and the Hamilton river project in Newfoundland, remained in the surveying stage.

Contracts had been let for Canada's first \$16,000,000 atomic power plant near St. Joachim, Ont., which was a joint undertaking of the federal government, the Hydro Electric Power commission of Ontario, and Canadian General Electric company. The plant was expected to produce 20,000 kw. in 1959. The Ontario Power commission assumed in its planning that by 1965 "nuclear fuel-electric stations will be more economical for base load operation than conventional fuel-electric generation." (R. RR.)

Other Countries.—Following on the Geneva atomic energy conference in the summer of 1955, there were in June 1956 the Conférence Internationale des Grands Réseaux Electriques in Paris and the World Power conference, in Vienna, which all produced a mass of information on the latest practice in electric power generation.

The total capacity of nuclear reactors planned in Canada, France, Sweden, Switzerland, the United Kingdom, the United States and the U.S.S.R. was about 2,300 Mw. The first to operate was Calder Hall (in 1956) and it was estimated that, in Britain, nuclear energy would contribute 16% of the total in 1965.

Most countries were actively examining the possibilities of nuclear energy to fulfil their future needs but there was general agreement that about 20 years must elapse before this source could make a significant contribution to the total energy required. Coal would remain as the most important source of thermally generated energy for several decades to come. Oil as a fuel increased in importance, but world political conditions threw some doubt on the dependability of this source. Hydroelectric schemes of ever-increasing magnitude were being studied. The World Power conference at Vienna reviewed national resources of energy and plans for development.



TINY TRANSISTOR capable of operating an electrical relay which will turn on a light bulb by reacting to the light generated by a match. The transistor, about the size of a pencil eraser, was developed by Westinghouse Electric Corp. and demonstrated in Dec. 1955

World Output of Electric Power*

	(In millions of kilowatt-hours)				
	1951	1952	1953	1954	1955
World total†	1,057,200	1,139,200	1,246,600	1,344,300	1,448,400
United States	433,358	463,055	514,169	471,684	546,408
U.S.S.R.	103,000	117,000	132,000	149,400	170,040
United Kingdom‡ . . .	59,568	61,992	65,508	72,900	80,148
Canada†	61,447	66,104	65,484	69,132	76,296
German Federal Republic	51,848	56,781	61,071	67,872	75,780
Japan	47,729	51,647	55,698	59,604	63,564
France	38,288	40,849	41,556	42,768	46,668
Italy	29,223	30,843	32,619	35,580	38,124
German Democratic Republic	20,700	22,400	23,700	25,952	28,972
Sweden	19,348	20,545	22,430	23,952	24,972
Norway	17,750	18,866	19,622	21,780	22,272
Poland	10,600	12,000	13,600	15,500	16,356
Union of South Africa	11,664	12,528	13,344	14,640	16,140
Australia	10,860	11,700	12,948	14,472	16,068
Czechoslovakia	10,400	11,700	12,400	13,800	15,144
Switzerland‡	10,248	10,848	11,124	11,244	12,432
Spain	8,287	9,416	10,116	10,476	11,196
Belgium	9,498	9,468	9,806	10,572	11,184
Netherlands	7,911	8,599	9,060	10,584	11,184
India‡	5,856	6,120	6,624	7,524	8,484
Austria	7,375	8,032	8,764	7,716	8,388
Mexico	4,908	5,337	5,703	6,300	6,996
Finland	4,610	4,769	5,403	5,688	6,744

*Only countries with an output exceeding 6,000,000,000 kw.hr. in 1955 are included. †Total output, i.e., including that by industrial establishments generating primarily for own use, if not otherwise stated. ‡Excluding China. §Production by enterprises generating primarily for public use. ¶Excluding Northern Ireland and Lochaber Power Co. ||Excluding electricity generated by the federal railways. ¶Coverage incomplete, about 95% of total production.

Europe.—Two reports of the Organization for European Economic Cooperation (O.E.E.C.), *The Electricity Supply Industry in Europe* and *Europe's Energy*, gave a comprehensive survey of progress and future requirements. Consumption of electrical energy rose by 10% in both 1954 and 1955 and although difficulties in financing new construction were still serious in some countries, as a whole they were much reduced. Forecasts for the future were that electricity production would rise from a total (for O.E.E.C. member countries) of 350,000,000,000 units a year in 1955 to 480,000,000,000 in 1960 and between 1,050,000,000,000 and 1,400,000,000,000 in 1975, by which date nuclear production might amount to 200,000,000,000 units as compared with 350,000,000,000 from hydro power and 850,000,000,000 from thermal plant. (E. W. G.)

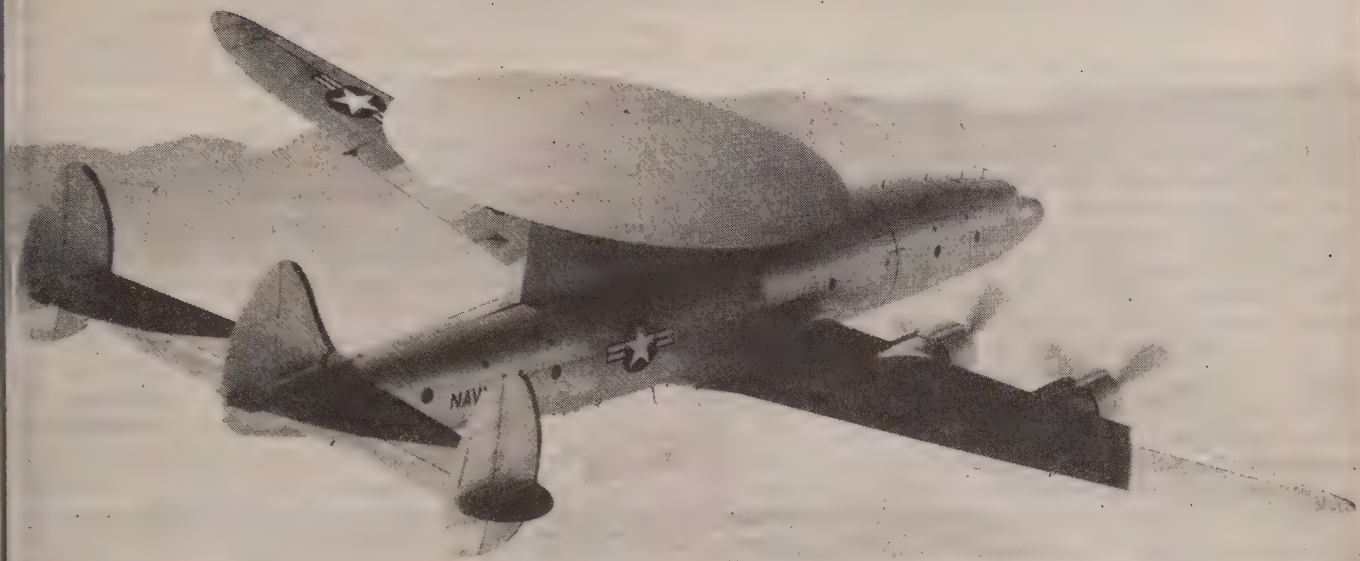
ENCYCLOPEDIA BRITANNICA FILMS.—*Light and Power* (1955); *Water Power* (1937).

Electric Transportation: see URBAN TRANSPORTATION, U.S.
Electrification, Rural: see RURAL ELECTRIFICATION ADMINISTRATION.

Electronics. During 1956 earlier and more reliable warning of storms were foreseen for the United States with the aid of a network of 31 specially designed weather radar sets to be installed by the U.S. weather bureau at strategic points along the eastern and Gulf coasts, as well as inland. Each of these would be able to detect hurricanes, tornadoes and other storms as far as 250 mi. away, relay the data from one station to the next and thereby provide meteorologists with a continuous check on storm progress and development.

Weather radar is based on the fact that rain and clouds reflect radar waves. Following World War II, the weather bureau used military equipment, with a range of 150 mi. or less, to track storms with an accuracy not previously possible. It was planned that as new sets became available early in 1958 from the manufacturer, Raytheon Manufacturing company, at the rate of about five per month, the old equipment would be reconditioned for installation at weather bureau stations along the coast and inland which were now without radar.

One feature of the new sets was that they would be convertible, operating at frequencies of 9,300, 5,600 or 2,800 megacycles, enabling operators to select the frequency best suited for the weather conditions anticipated. Because it would be possible to study the entire life cycle of a storm, and to analyze its structure from the time it formed until it disappeared, the new



AIR-BORNE RADAR DOME, resembling a "flying saucer," mounted on a U.S. navy Super Constellation plane, an aircraft development by Lockheed Aircraft Corp. in 1956. The radar plane was to be used for fleet protection and patrol of open ocean areas

Equipment was expected to be a valuable research tool, providing perhaps not only earlier and more reliable warning of storms but also clues as to the best ways of coping with these destructive conditions.

Radar for military application continued to appear, and the U.S. air force announced a new, lightweight, mobile set of long range and novel design which had been developed by the Westinghouse Electric corporation. Its principal feature is the antenna, designed to focus the radio waves into a beam like that of a searchlight, which sweeps around until it encounters an aeroplane. As the echo comes back, it is picked up by the antenna, which then acts as a telescope.

The antenna of the new set consists of two paraboloids, made of vinyl-coated Fiberglas fabric, which are joined at their rims and inflated. One surface is coated on the inside with aluminum so that it can reflect the radio waves and is called the Paraballoon antenna. The antenna and other equipment are covered by a flexible "radome," also supported by air pressure inside. Blowers maintain pressure slightly higher in the Paraballoon than just under the radome, which, however, is still higher than that of the air outside. If necessary, the entire radar set may be dropped from an aeroplane. A trained crew of 20 men can erect it in two hours.

A system that would save considerable time in transmitting intercept information to fighter aircraft was disclosed in an announcement of air-borne "data link" radio units to be built for the U.S. air force by the General Electric company. Data would be fed from a network of air-borne, shipboard and land-based radars to a ground-control centre complete with electronic computers. Intercept information would be automatically coded for transmission to the units on the fighter aircraft, which would select the proper message for that particular aircraft and convert it for display on a cockpit indicator. The same data could also be fed into the plane's automatic pilot or transmitted to guided missiles.

An electronic system known as Low Altitude Bombing, developed by the Minneapolis-Honeywell Regulator company, permits "loft bombing," whereby the rapid movement of the plane itself hurls the bomb into the air so that it falls on the target. The

bombing pilot heads for a landmark a little short of the target. As he approaches it, the preset electronic system takes over control and pulls up the plane into a steep climb. At the proper instant the bomb is released, with a speed comparable with that of a shell from an 81-mm. mortar, which has a range of two miles. Since it may take nearly a minute for the bomb to reach the target, as it climbs and then falls, the pilot is able to roll his plane over to an upright position and fly to safety before the explosion.

Structures inside the human body, such as the pancreas, may be "photographed" with high-frequency, ultrasonic waves, using a new diagnostic device developed by E. E. Suckling of the State University of New York college of medicine and William R. MacLean of the Polytechnic Institute of Brooklyn, N.Y. The sonic camera comprises a plastic tank filled with water, in which the object to be viewed is placed, a source of the ultra-sound, and a sonic lens that forms an image of the object on a piezoelectric crystal. This converts the waves into varying electrical charges, which are scanned, amplified and displayed on a screen like that of a television receiver, thereby presenting an image that can be viewed or photographed. With the waves only one-fiftieth of an inch long, objects about as small as that could be detected. This suggests that nerves, veins, arteries and small lesions in the body might be photographed.

An instrument that might provide an automatic analysis of brain waves recorded on the electroencephalograph and permit faster and more accurate analysis of the men who have to stand the stresses of jet flight was developed jointly by the Aero Medical laboratory of the air research and development command, Wright Air Development centre, and the Mechanics Research department of the American Machine and Foundry company. The data developed by this Period Analyzer proved to be a sensitive measure of physiological changes which affect the shape and frequency of the recorded brain waves. It seemed to be more sensitive than methods presently used in distinguishing degrees of sleep and wakefulness in the subjects. Since it could also correlate the pattern of brain waves more precisely with oxygen

deficiency in the blood, it was anticipated that it might lead to an automatic device which would correct this condition in pilots by switching on more oxygen as soon as a deficiency appeared.

A device somewhat analogous to the electroencephalograph, the electrogastrograph, which detects waves of electrical activity in the stomach, was developed and studied by a research team headed by Edmund N. Goodman at Presbyterian hospital, New York city. Minute electrodes make contact with the mucous membrane lining the stomach. After examination of more than 1,000 subjects, Goodman found a basic pattern for the normal stomach, consisting of three waves per minute. A strikingly different pattern was found in 70% of a group of patients with stomach cancer, which suggested that the device might give early warning of such malignant conditions.

At ocean depths of 2,000 ft., where the illumination is about one-trillionth of 1% of the full sunlight at the surface, light measurements can be made with a new instrument called the bathyphotometer, developed by George L. Clark and Gunther K. Wertheim, of Harvard university. The limit of most instruments previously used for such measurements was about 0.01% of full sunlight, at depths of less than 600 ft.

When the bathyphotometer was lowered into the sea on a moonless night, it was found that the light fell off rapidly until it reached a depth of about 600 ft., where flashes of light were encountered. Below this the flashing increased, becoming constant at 900 ft. At 1,800 ft. there was no difference in the amount of light at day or night. This illumination was attributed to luminescent organisms at these depths.

The light-recording equipment consisted of two parts. One was an underwater unit, carrying the photomultiplier tube, which detected the light and amplified it, and a pressure gauge to determine the depth. The other was the deck unit, which recorded the measurements. Tests of the equipment were made from research vessels of the Woods Hole (Mass.) Oceanographic institution.

Another electronic device for seeing in the dark, announced during 1956, was the ebicon, a development of two Westinghouse scientists, R. J. Schneeberger and R. W. Decker. The name comes from the initials of the phrase "electron bombardment induced conductivity," the effect basic to its operation. As light strikes the tube, electrons are produced, and are then accelerated by a potential of about 20,000 v. Hitting a storage target, consisting of a small aluminum-coated metal screen and a selenium semiconductor, these electrons are both stored and multiplied. This produces a signal large enough to operate conventional multipliers. The ebicon gave promise of operating at light levels far lower than the human eye can detect, so that it would show a scene where the darkness seems complete.

Slowed-down motion pictures of the inside of an aircraft engine while it is running are possible with an X-ray motion-picture technique called strobioradiography, announced by the General Electric company's X-ray department. A betatron, operated at 5,000,000-15,000,000 v., provides pulses of highly penetrating X-radiation, lasting but a few millionths of a second, to make the radiograph. The exposure may be accurately synchronized with the motion of the machine and repeated a number of times at the same stage of the cycle in order to produce a fully exposed picture. To obtain slow-motion movies, such X-ray still pictures are taken, for example, at various points in the travel of a piston, and the exposures are spliced together to show the complete operation.

The gears used in an automatic transmission for an automobile must be very accurate, necessitating careful inspection and gauging. This is done automatically with an electronic gear gauge, developed for the Plymouth transmission plant by the Airborne

Instruments Laboratory, Inc., at Mineola, N.Y. Each gear is automatically inspected as it comes from the hobber where it is machined. If the gear is not right, it is set aside, and a control signal is sent to the machine to adjust it and correct the error. Moreover, the unacceptable gears are automatically divided into two groups, those that can be salvaged and those that are unsalvageable.

An electronic banker that is able to perform the daily bookkeeping tasks for 55,000 commercial checking accounts was developed by the Stanford Research institute, of California, and was to be constructed for the Bank of America by the General Electric company. The device was called erma (electronic recording machine—accounting). It was described by banking officials as being capable, when operated by a staff of eight operators and clerks on a two-shift basis, of sorting checks and deposit slips and entering the amounts in the individual accounts of each customer. It could remember details of all transactions, maintain customers' correct balances, accept stop-payment orders and immediately notify the operator of an overdrawn balance. (J. Sto.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Receiving Radio Messages* (1943); *Sending Radio Messages* (1943); *Sound Recording and Reproduction* (1943); *Vacuum Tubes* (1943).

Elementary Education: see EDUCATION.

Elements: see PHYSICS.

Elizabeth II

(ELIZABETH ALEXANDRA MARY) (1926–) queen of Great Britain, was born at London April 21. She spent her early years at the London home of her father, then duke of York, at Windsor and at Balmoral castle. She was educated by her governess, Marion Crawford, and Sir Henry Marten, later vice-provost of Eton. During World War II she joined the Mechanical Transport Training centre, Aldershot. In 1947 she visited South Africa with the king and queen and Princess Margaret, and from there on her 21st birthday she broadcast to the empire, promising "My whole life shall be devoted to your service." Her engagement to Prince Philip of Greece (who later became the duke of Edinburgh) was announced in July 1947; they were married in Westminster abbey on Nov. 20. Prince Charles was born on Nov. 14, 1948; Prince Anne on Aug. 15, 1950. In 1951 she toured Canada and visited Washington, D.C., with the duke of Edinburgh, but in 1952 she was obliged to cut short her tour of the commonwealth by the death of her father on Feb. 6. She was crowned at Westminster abbey on June 2, 1953.

The queen received Juscelino Kubitschek de Oliveira, president of Brazil, on Jan. 11, 1956. She left with the duke of Edinburgh on Jan. 27 for Lagos, Nig., and returned to London on Feb. 17. Their tour of Nigeria included a spectacular durbar at Kaduna and a visit to a leper settlement on the Oji river. N. A. Bulganin and N. S. Khrushchev of the Soviet Union visited them at Windsor castle on April 22. During June 8–10 the queen and the duke paid a state visit to Sweden. King Feisal II of Iraq was welcomed by the queen on July 16 when he arrived in Great Britain for a state visit.

Elks, Benevolent and Protective Order of: see SOCIETIES AND ASSOCIATIONS, U.S.

Ellice Islands: see PACIFIC ISLANDS, BRITISH.

El Salvador: see SALVADOR, EL.

Emigration: see IMMIGRATION, EMIGRATION AND NATURALIZATION.

Employment. **United States.**—The total labour force of the United States increased by 2,582,000 from 69,692,000 in June 1955 to 72,274,000 in June 1956. Total

employment increased by 2,487,000, from 64,016,000 in June 1955 to 66,503,000 in June 1956. This increase was accounted for by a rise of 2,734,000 in the size of the civilian labour force (from 66,696,000 to 69,430,000) and a growth in the number of unemployed of 248,000 (from 2,679,000 to 2,927,000). Both agricultural and nonagricultural employment increased during this period. Nonagricultural employment grew by 2,292,000 (from 56,335,000 to 58,627,000); and agricultural employment grew by 195,000 (from 7,681,000 to 7,876,000).

Male employment behaved in a manner similar to total employment. Male employment rose from 44,135,000 (June 1955) to 45,351,000 (June 1956), an increase of 1,216,000. This increase was accounted for by an increase of 1,230,000 in the male civilian labour force (from 45,888,000 to 47,118,000) and an increase in male unemployment of 14,000 (from 1,753,000 to 1,767,000). During this period the male total labour force rose from 48,848,000 to 49,928,000, an increase of 1,080,000.

Females in the civilian labour force numbered 22,312,000 in June 1956, and represented an increase of 1,504,000 over the level of June 1955. Female employment rose by 1,271,000 (from 10,882,000 in June 1955 to 12,153,000 in June 1956). The number of unemployed females also increased from 926,000 to 1,160,000, an increase of 234,000.

It is interesting to note that the increase in the size of the civilian labour force, from June 1955 to June 1956, was composed of an increase of 1,230,000 males and 1,504,000 females. Similarly, the 2,487,000 increase in employment was taken up by an increase in male employment of 1,216,000 and in female employment of 1,271,000.

The total number of employees in nonagricultural establishments continued to increase. In June 1955 the number was 50,155,000, and it grew by 1,377,000 to 51,542,000 in June 1956. Wholesale and retail trade absorbed 313,000 of this increase. Wholesale trade employment rose by 118,000, and retail trade employment rose by 195,000. Contract construction accounted for 307,000 of this increase. Government employment grew by 77,000. Almost the entire increase in this form of employment was accounted for by the growth in state and local government employment. Federal government employment grew by 5,000, whereas state and local governments increased employment by 2,000. In June 1956 state and local government employment

was 4,950,000, and federal government employment was 2,188,000. Employment in the manufacturing sector increased by 180,000. Of this total, 98,000 was accounted for by the durable goods sector and 82,000 by the nondurable goods sector.

There was a great divergence of employment trends within the manufacturing sector. Total manufacturing employment rose by 180,000, but some manufacturing industries experienced substantial declines in employment. Gains in employment occurred in the machinery (except electrical) industry (+110,000), electrical machinery industry (+64,000), food and kindred products (+37,000), printing, publishing and allied industries (+36,000), primary metal industries (+34,000), chemicals and allied products (+24,000), stone, clay and glass (+20,000), paper and allied products (+19,000), instruments and related products (+12,000), furniture and fixtures (+10,000) and miscellaneous (+9,000). Losses of employment occurred in transportation equipment (-91,000), lumber and wood products (-44,000), fabricated metals (-17,000), textile mill products (-17,000), ordnance and accessories (-10,000), leather and leather products (-8,000), rubber products (-3,000), tobacco manufactures (-3,000), apparel (-1,000) and products of petroleum and coal (-1,000).

A slight decline occurred in the average weekly hours worked in the entire manufacturing sector. In May 1955 the average weekly hours worked were 40.8 and in May 1956 the average weekly hours worked in manufacturing had dropped to 40.

United Kingdom.—Employment increased and unemployment decreased in the British economy during the year 1955. The number in civil employment grew by 279,000, or 1%, from 22,721,000 in Dec. 1954 to 23,000,000 one year later. This growth was the result of 197,000 more in the working population, 30,000 fewer unemployed and 51,000 fewer in the armed forces. During the period Dec. 1954 to Dec. 1955, the working population grew from 23,823,000 to 24,020,000, a 1% increase. Registered unemployment fell from 280,000 to 250,000; and the size of the armed forces and women's services fell by 6%, from 830,000 to 779,000.

Men comprised 67% of the total working population in Dec. 1955, and approximately the same percentage of the numbers in civil employment were men. Of the 279,000 increase in civil employment from Dec. 1954 to Dec. 1955, 143,000, or 51%, were men. Of the 197,000 increase in the total working population from Dec. 1954 to Dec. 1955, 120,000, or 61%, were women and 39% were men.

As in 1954, the main increases in employment occurred in the manufacturing industries and the distributive trades. Except for textiles and clothing, all the main manufacturing groups increased

Table I.—Employees in Nonagricultural Establishments, by Industry, United States

Industry	(In thousands)	June 1956	June 1955
Total employees		51,542	50,155
Mining		809	783
Contract construction		3,235	2,928
Manufacturing		16,757	16,577
Ordnance and accessories		130.0	139.6
Food and kindred products		1,575.6	1,539.3
Tobacco manufactures		87.8	90.5
Textile mill products		1,049.5	1,067.3
Apparel and other finished textile products		1,174.6	1,176.2
Lumber and wood products except furniture		739.6	784.0
Furniture and fixtures		369.9	359.7
Paper and allied products		567.9	549.0
Printing, publishing and allied industries		854.7	818.9
Chemicals and allied products		830.5	806.7
Products of petroleum and coal		254.4	255.0
Rubber products		271.4	273.9
Leather and leather products		373.7	381.6
Stone, clay and glass products		576.6	556.7
Primary metal industries		1,333.8	1,300.1
Fabricated metal products (except ordnance, machinery and transportation equipment)		1,097.9	1,114.7
Machinery (except electrical)		1,719.2	1,608.6
Electrical machinery		1,177.9	1,113.7
Transportation equipment		1,745.7	1,836.6
Instruments and related products		334.3	322.3
Miscellaneous manufacturing industries		491.6	483.0
Transportation and public utilities		4,165	4,083
Wholesale and retail trade		11,028	10,715
Finance, insurance and real estate		2,326	2,231
Service and miscellaneous		6,084	5,937
Government		7,138	6,911
Federal		2,188	2,183
State and local		4,950	4,728

Source: United States Department of Labor, Bureau of Labor Statistics, *Monthly Labor Review*.

Table II.—Distribution of Manpower Civil Employment During 1955, United Kingdom

Industry or service	Strength (in 000s) at		Change during 1955	
	Dec. 1954	Dec. 1955	000s	%
Basic industries, total	3,962	3,947	- 15	- 1/2
Coal mining	784	779	- 5	- 1/2
Other mining and quarrying	80	79	- 1	- 1
Gas, electricity and water	376	378	+ 2	+ 1/2
Transport and communication	1,691	1,699	+ 8	+ 1/2
Agriculture and fishing	1,031	1,012	- 19	- 2
Manufacturing industries, total	9,159	9,337	+178	+2
Chemicals and allied trades	512	526	+ 14	+2 1/2
Metals, engineering and vehicles	4,482	4,655	+173	+4
Textiles	991	952	- 39	-4
Clothing (including footwear)	684	674	- 10	-1 1/2
Food, drink and tobacco	899	915	+ 16	+2
Other manufactures	1,591	1,615	+ 24	+1 1/2
Building and contracting	1,438	1,465	+ 27	+2
Distributive trades	2,811	2,869	+ 58	+2
Professional, financial and miscellaneous services	4,053	4,098	+ 45	+1
Public administration				
National government service	574	560	- 14	-2 1/2
Local government service	724	724	...	...
Civil employment, total	22,721	23,000	+279	+1

Source: Ministry of Labour Gazette (Feb. 1956).

their labour forces. Total manufacturing employment rose by 178,000. Employment in textiles declined by 39,000 and in clothing by 10,000. Much the largest rise, 173,000, occurred in the metals, engineering and vehicles group, which included increases of 46,000 in vehicle manufacture and 45,000 in the production of electrical goods and equipment. Employment increased in all industry groups except agriculture, mining and public administration.

Canada.—The civilian labour force of Canada increased from 5,426,000 in 1954 to 5,558,000 in 1955. In May 1956 this total was 5,664,000. During this same period, the total civilian labour force with jobs increased from 5,194,000 (in 1954) to 5,327,000 (in 1955) to 5,499,000 in May 1956. Employment in agriculture declined from 873,000 (1954) to 818,000 (1955) and was 817,000 in May 1956. On the other hand, nonagricultural employment increased during the period from 4,320,000 (1954) to 4,510,000 (1955) to 4,682,000 (May 1956). Unemployment declined during this period from 232,000 (1954) to 230,000 (1955) to 165,000 (May 1956). The index of total employment (1949=100) rose from 109.9 (1954) to 112.5 (1955) to 113.4 (April 1956). In forestry, the employment index rose from 95.1 (1954) to 101.8 (1955). The employment index in mining increased from 109.8 (1954) to 113.4 (1955). In manufacturing, the index also rose from 107.7 (1954) to 109.3 (1955). Both the durable and nondurable sectors exhibited increases in the index of employment. In the durable sector, the index rose from 115.0 to 116.6, while the index increased from 101.4 to 103.9 in the nondurable sector, from 1954 to 1955. Similarly, the index increased in construction, transportation and communication, trade, finance and service, from 1954 to 1955.

Australia.—The general employment index (1953=100), excluding agriculture but including forestry, fishing and trapping, rose from 106 in March 1955 to 108 in March 1956. Employment in manufacturing (1953=100), including wage earners and salaried employees, rose from 108 in March 1955 to 109 in March 1956.

France.—The general employment index (1953=100), excluding agriculture and certain services, increased from 101 in Jan. 1955 to 103 in Jan. 1956. Using the same base, the index of manufacturing employment, including wage earners and salaried employees, increased from 101 in Jan. 1955 to 102 in Jan. 1956.

Japan.—The Japanese index of general employment (1953=100), excluding agriculture but including fishing, rose from 107 in March 1955 to 116 in March 1956. Again, with 1953 as a base, the index of manufacturing employment, including wage earners and salaried employees, rose from 101 in March 1955 to 121 one year later.

Norway.—The index of general employment (1953=100), excluding agriculture, grew from 102 in April 1955 to 103 in April 1956. Using the same base, the index of employment in manufacturing, covering both wage earners and salaried employees, rose from 103 in April 1955 to 105 one year later.

Union of South Africa.—The index of general employment (1953=100), excluding agriculture and commerce, was at 107 in both March 1955 and March 1956. The index of employment in manufacturing, including mining and quarrying, was 107 in March 1955 and 108 in March 1956, with 1953 as the base year.

West Germany.—The index of general employment, excluding agriculture, grew from 107 in March 1955 to 114 one year later. The year 1953 is used as the base year. The index of employment in manufacturing, including both wage earners and salaried employees (1953=100), grew from 109 in March 1955 to 118 in March 1956.

(See also BUILDING AND CONSTRUCTION INDUSTRY; BUSINESS REVIEW; CENSUS DATA, U.S.)

(P. TA.)

Endocrinology.

Hypothalamus and Pituitary.—New evidence was presented in 1956 which it was believed might clarify the function of the little understood hypothalamic portion of the brain. The pituitary gland, long known as the master gland, was again shown to be really subservient to higher centre, the hypothalamus. A highly potent fraction was isolated from the hypothalamus which puts the pituitary gland to work when the animal or human is faced by physical or mental stress. It seems that specific hypothalamic substances stimulate the release of ACTH (adrenocorticotrophin) which in turn stimulates the adrenal glands. These findings were given further confirmation by independent studies wherein a technique was developed for stimulation of certain areas in the hypothalamus through permanently implanted electrodes in the conscious monkey. Stimulation through electrodes implanted in the infundibular region of the hypothalamus produced marked elevation in the secretion of adrenal cortical hormones, whereas stimulation of the electrodes in the anterior thalamus failed to elicit a similar adrenal response. It would appear that ACTH secretion is regulated by selective areas in the hypothalamus. These discoveries lent support to the theory that the hypothalamus secretes substances which govern the pituitary gland, and thus it may be said that in some measure the hypothalamus regulates the endocrine system.

Of considerable importance in endocrinology was the work on the isolation of pituitary hormones and the structure of the pituitary hormone molecules such as ACTH. It appeared that large pituitary hormone molecules like ACTH are simply conglomerates of several hormones. Efforts were being made to fragment the large molecule and identify each part with some specific function.

In 1953 the chemical structure was proposed for vasopressin, a hormone stored in the posterior pituitary gland. By 1956 this substance had been synthesized, the second hormone of the pituitary gland to be analyzed and built up in the chemistry laboratory. The first was oxytocin, an important factor in childbirth and lactation. Vasopressin may be described as a blood pressure raising and antidiuretic principle. The synthetic product had the same chemical, physical and biological properties as the most potent extracts obtained from natural sources. It was expected that the use of synthetic vasopressin for the treatment of diabetes insipidus would eliminate the allergic reactions so often encountered with the preparations obtained from extracts of the posterior pituitary gland.

Adrenals.—Successful synthesis of aldosterone was also accomplished. Aldosterone is one of about 30 hormones that have been isolated from the cortex of the adrenal. It is perhaps the most important of the adrenal cortical hormones.

Adrenal function was implicated as a factor in hypertension by researchers in experimental animals such as mice and rats. One investigator found that the administration of minute amounts of aldosterone to both intact and adrenalectomized mice, for several months, resulted in the development of hypertension. Another demonstrated that a condition closely resembling the syndrome of malignant hypertension in human beings was induced in young rats during regeneration of the adrenal cortex following the enucleation of the adrenals.

Previously, the opinion had been prevalent that adrenocortical cancer was an autonomous tumour which was not influenced by ACTH or cortisone administration. A person with a functional adrenocortical cancer was recently studied before and after metastases. Unlike previously reported adrenocortical cancer this tumour was not autonomous, since, in response to ACTH there was a decided rise in steroidal output. Furthermore, when cortisone was administered there was a significant fall in ketosteroids below control levels. Furthermore, chemical modification

of the secretory capacity of the tumour was achieved during administration of a drug known as amphenone, a pituitary inhibitor. The importance of this study lay in the demonstration that this adrenocortical cancer retained residual capacity to respond to both humoral and drug influence. This finding bore significantly on the problem of endogenous and exogenous control of function of these tumours and gave encouragement to the search for similar effects with other neoplasms.

New tests for the detection of pheochromocytoma were advanced during the year. One involved the use of a spiral strip of rabbit aorta placed in a muscle bath. When urine from a patient with a pheochromocytoma was added to the water bath a marked increase in height of contractions was recorded on a slowly revolving drum.

Another aid in diagnosis of this tumour was a new simple test using the adrenergic blocking agent piperoxan. The test was based on the effects of this agent on urinary volume following the ingestion of a salt-water load. In a normal person the administration of piperoxan results in increased urinary output, whereas the patient with a pheochromocytoma shows a decrease.

Thyroid.—The concept that hyperthyroidism increases resistance to tuberculosis received confirmation. When rabbits which were known to be highly susceptible to tuberculosis were made hyperthyroid by injections of triiodothyronine, the resistance to tubercle bacilli was markedly increased. Animals which were rendered hypothyroid by the administration of propylthiouracil were found to have a diminished resistance to the experimental production of tuberculosis. It is believed that hyperthyroidism increases physiologic activity of phagocytes and thus speeds up destruction of bacilli. One of the reasons for the untoward effects of cortisone in tuberculosis may be the suppressive action of this hormone on thyroid function.

Diabetes and Metabolism.—One of the most significant developments in the field of diabetes mellitus was the discovery of compounds for oral use which lower blood sugar. Although it had been known since 1941 that a variety of sulfonamide derivatives are effective hypoglycemic agents in animals, only recently had extensive trials been made with the aryl sulfonylureas in human diabetics. Of the two antidiabetic agents extensively evaluated, one of them, tolbutamide, proved preferable because of minimal side effects, in comparison with the other, carbutamide.

The mechanism of the hypoglycemic action of the sulfonylureas remained to be clarified. The theory most current was that these agents stimulate the production of insulin in patients with mild diabetes. Extensive evidence, however, had been gathered to favour the concept of insulinase inhibition; *i.e.*, inhibition of the enzyme that destroys insulin. A third widely held theory was that these drugs act on the liver by inhibiting gluconeogenesis (the conversion of protein into carbohydrates), thus lowering the blood sugar.

These orally effective agents had been found most useful in controlling hyperglycemia and glycosuria of patients with the adult form of diabetes mellitus. They did not prove of value in the management of juvenile diabetics. In general, the range of usefulness of these oral hypoglycemic agents varied considerably from an enthusiastic 66% to a more sober figure of 10% of diabetics who needed treatment in addition to dietary control.

Reproduction and Sex Hormones.—A potent purified preparation of relaxin, the ovarian hormone of pregnancy responsible for pubic relaxation, was developed. The source of the raw material is the ovaries of pregnant sows. When used early enough this hormone can diminish the frequency and severity of uterine contractions and halt premature labour, thus allowing the foetus additional time for growth in the uterus.

Several new steroid compounds with increased progestational activity became available for clinical use. One of these, 17-alpha-

ethinyl-19-nortestosterone, more simply known as norethisterone, was shown to be somewhat more potent than ethisterone (17-ethinyl testosterone). Another preparation, 17-alpha-hydroxyprogesterone caproate, is a long-acting progestogen with marked progestational activity. Some idea as to the prolonged activity of this compound may be obtained when its effect on withdrawal bleeding in amenorrhoeic females is compared with that of progesterone. A single injection of 50 to 100 mg. of progesterone, when administered to a female with functional amenorrhoea, will be followed by withdrawal bleeding within 48 hours in most instances. When 125 to 250 mg. of 17-alpha-hydroxyprogesterone caproate is employed, withdrawal bleeding will be delayed for 7 to 14 days. This property of long action is particularly desirable since it obviates the need for frequent injections of progesterone which are often employed in the management of threatened and habitual abortion.

Recent studies showed that accurate prediction of the sex of the unborn infant during the ninth month of pregnancy is possible by obtaining cells from the amniotic fluid. The presence of a sufficient number of cells with nuclei containing a positive sex chromatin mass is indicative of a female child.

The discovery of "sex chromatin" in resting somatic cell nuclei, and its dimorphism in accordance with the genetic sex of the individual, opened new approaches to the study of various types of anomalies in the sexual sphere. A male sex chromatin pattern was found in most cases of gonadal dysgenesis with castrate-female type of secondary sex characteristics. Surprising indeed was the observation that many eunuchoid males with gynecomastia and atrophic bilateral scrotal gonads have a female sex chromatin pattern. Furthermore, determination of the sex chromatin pattern in intrinsic testicular disorders would probably facilitate classification and serve to differentiate cases of definite congenital origin.

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ENCYCLOPÆDIA BRITANNICA FILMS.—*Endocrine Glands* (1939).

England: see GREAT BRITAIN & NORTHERN IRELAND, UNITED KINGDOM OF.

English Literature. **General.**—The holding of the P.E.N. International congress in London in 1956 not unnaturally directed attention to the present condition of English literature in its several branches, considered as a means of expression and not merely as a vehicle for facts. A tangible offshoot from the discussions was the symposium, edited by John Lehmann, on *The Craft of Letters in England*. Its talented contributors discussed not only the creative arts of poetry and fiction but also those fields of applied literature, such as history, biography, criticism and philosophy, wherein an author's personal conviction could shape and colour the work. As it chanced, this individual approach was present in many of the year's productions, which thus proved livelier than the somewhat gloomy expectations aroused by these surveyors. The analysis of gloom itself could be almost a triumph, as 24-year old Colin Wilson showed in *The Outsider*, described by him as "an inquiry into the nature of the sickness of mankind in the mid-twentieth century." This brave exploration into real and fictional characters caught the public imagination and supplied a new term for a type of spiritual rebel that had long been recognized

but never so clearly defined.

Other, more practised, writers focusing on a less comprehensive field, still shaped their beliefs and theories with a fearless independence. Aldous Huxley, one of the few remaining adherents of the discursive essay, brought to *Adonis and the Alphabet* all his traditional erudition, wit and exhortation, tackling some of humanity's newest problems with the wisdom of a lengthening experience. Jack Lindsay and Christopher Hollis, writing respectively on the life and work of George Meredith and George Orwell, each stressed the political motives of his subject. With Meredith, the most substantial and serious effort yet made to assess his stature lost something in balance and finality by this insistence on an almost Marxian creed. Orwell on the contrary left his zealous analyst defeated on political and religious doctrine, certain only that he stood for liberty and the decencies. In *Amphibian: a Reconsideration of Browning* Henry Charles Duffin brought a fresh, unorthodox view to bear on the printed poems; while *Shelley at Work* was built up by Neville Rogers from a close scrutiny of the poet's rough notebooks, tracing the thought-progressions through a broken stanza, a Platonic reference or a drawing of trees and boat.

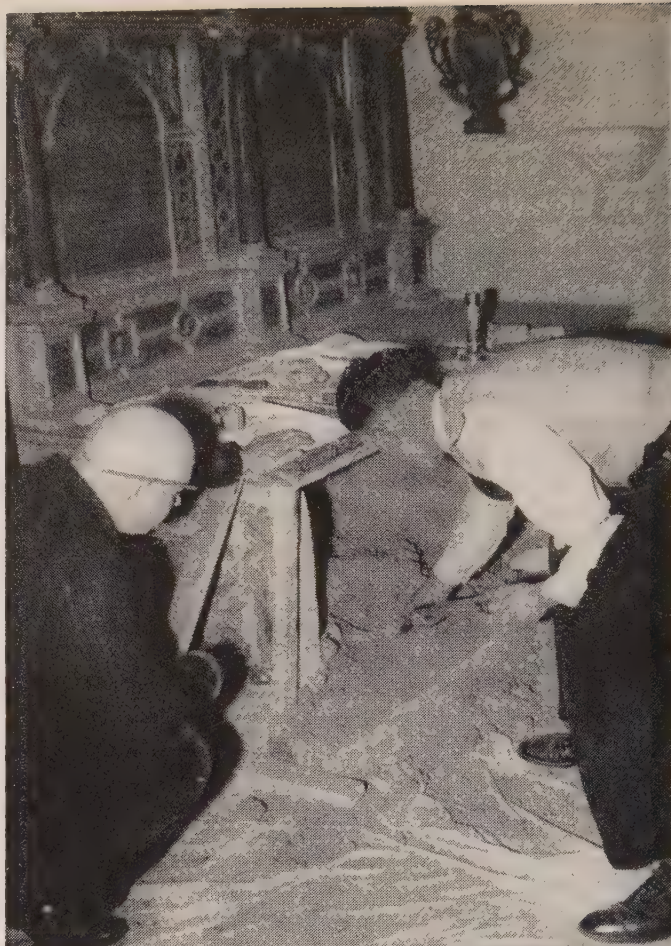
Even full-scale biographical works were stamped frequently by the individual outlook. St. John Ervine's *Bernard Shaw: His Life, Work and Friends*, with its new material and unpublished diaries, was not only the weightiest record to date, but gained much in truth and virility from its author's personal friendship with his subject. Thus, also, only the son of Stanley Baldwin could have revealed the inner strains and tensions of an unpopular prime minister in *My Father; the True Story*—a sympathetic yet undistorted narrative. Further—though without knowing his hero in the flesh—Christopher Devlin, himself a Jesuit, was able, in *The Life of Robert Southwell, Poet and Martyr*, to enter vividly into the career of the inspired and hunted Jesuit priest in England during the reign of Elizabeth I.

The now-popular compendium of personal story, science and travel appeared in C. W. Cerram's (K. W. Marek) *Narrow Pass, Black Mountain*, on the Hittite empire; and in Norman Kemp's report on the South Polar expeditions, *Conquest of the Antarctic*. Other travellers tended to favour the near east; Lord Kinross (J. P. D. Balfour) writing with enjoyment of the ruins, history and present-day aspect of *Europa Minor*, Desmond Stewart and John Haylock tempering description with a discussion of politics in *New Babylon: a Portrait of Iraq*, and Robert Liddell's *Byzantium and Istanbul*, if a trifle opinionated, providing useful guidance to the city's evolution and antiquities. A more general *History of Turkey* was compiled by M. Philips Price; but Alan Moorehead's focus on *Gallipoli* concentrated also on its most significant event of modern times—the wasted campaign in World War I, admirably set forth in its disturbing detail. The historians of broader scope were led impressively by Sir Winston Churchill, of whose projected *History of the English-Speaking Peoples*, vol. 1, *The Birth of Britain*, was followed in a matter of months by vol. 2, *The New World*, carrying the tale to 1688.

Earl Leslie Griggs edited the first two volumes (1785–1806) of *Collected Letters of Samuel Taylor Coleridge*, which promised to be the most complete and accurate collection of the self-revelatory correspondence. Similarly, E. S. de Beer edited and expanded *The Diary of John Evelyn*, with new material, into six volumes; and unpublished documents filled out Sir Geoffrey Keynes' edition of *The Letters of William Blake*. Most striking, in its novelty and expressiveness, was the first volume (edited by Joan Evans and J. H. Whitehouse) of *The Diaries of John Ruskin*.

Other books of the year included:

BIOGRAPHY.—J. H. Plumb, *Sir Robert Walpole: (vol. 1) The Making of a Statesman*; Richard Barkeley, *The Empress Frederick, Daughter of Queen*



WORKMEN EXPLORING tomb of Sir Thomas Walsingham at Chislehurst, Eng., May 1, 1956, in a fruitless search for a document which was believed would prove that Christopher Marlowe (1564–93) had written the plays of William Shakespeare

Victoria; Virginia Cowles, *Edward VII and His Circle*; Tom Driberg, *Beaverbrook*; René MacColl, *Roger Casement: A New Judgment*; Charles Beatty, *Ferdinand de Lesseps*; Robert Speaight, *Life of Hilaire Belloc*; A. Vibert Douglas, *Arthur Stanley Eddington*; Mary Moorman, *William Wordsworth, the Early Years*.

MEMOIRS AND LETTERS.—L. E. Jones, *An Edwardian Youth*; Negley Farson, *A Mirror for Narcissus*; Sir John Kotelawala, *An Asian Prime Minister's Story*; E. M. Forster, *Marianne Thornton*; John Malcolm Brinnin, *Dylan Thomas in America*; Eric Newby, *The Last Grain Race*; Violet Markham, *Friendship's Harvest*; Duchess of Windsor, *The Heart Has Its Reasons*; Virginia Woolf and Lytton Strachey, *Letters*; J. R. Hale (ed.), *The Italian Journal of Samuel Rogers*.

LITERARY CRITICISM.—Geoffrey Briereton, *An Introduction to the French Poets: Villon to the Present Day*; James Reeves, *The Critical Sense*; David Daiches, *Literary Essays*; Mario Praz, *The Hero in Eclipse in Victorian Fiction*; Robert Gittings, *The Mask of Keats*; F. E. Halliday, *Shakespeare in His Age*.

TRAVEL.—Sacheverell Sitwell, *Denmark*; Peter Schmid, *Beggars on Golden Stools*; Lobsang Rampa, *The Third Eye*; Agnes Newton Keith, *Bare Feet in the Palace*.

HISTORY, POLITICS, SOCIOLOGY.—A. P. Ryan, *Mutiny at the Curragh*; William McElwee, *England's Precedence*; Aidan Crawley, *Escape From Germany*; Walter Lord, *A Night to Remember*; Field Marshal Sir William Slim, *Defeat Into Victory*; Percy Arnold, *Cyprus Challenge*; Michael Burn, *Mr. Lyward's Answer*; T. D. Kendrick, *The Lisbon Earthquake*; J. D. Scott, *Life in Britain*; Alan Pryce-Jones (ed.), *The New Outline of Modern Knowledge*. (S. NN.)

Fiction.—There were few new names in the fiction list of 1956, but many well-known writers added to their reputations. Rose Macaulay's *The Towers of Trebizond* displayed her familiar virtues of wit and erudition, and to these were added a subtle analysis of the spiritual predicament of a young woman torn between sacred and profane love. Sir Compton Mackenzie also astonished the critics by his *Thin Ice*, a study of homosexuality not so much from the psychological as from the politico-social point of view. Wyndham Lewis, on the other hand, disappointed with his *Red Priest*, a diatribe directed indiscriminately against both the Christian and the Communist ethics. C. P. Snow continued his sequence of studies in the new bureaucracy with

Homecoming. Judgment had to be suspended until the cycle reached completion, but the ambitious scope of his work commanded respect even when its detail did not excite.

The most widely discussed novel of the year was Angus Wilson's *Anglo-Saxon Attitudes*, an elaborate satire on English academic life. In its size and in the large number of its principal characters it recalled the Victorians, but it had a brittleness of texture and a shrillness of tone that gave it a strictly contemporaneous air. William Sansom's collection of short stories *A Contest of Ladies* was disappointing, but his novel *The Loving Eye* was his best work to date. William Golding's *Pincher Martin*, describing the last hours of a sailor shipwrecked on a rock in the north Atlantic, was a tour de force, which failed to reveal the remarkable powers of original narration displayed in his first two books. Elizabeth Jane Howard's *The Long View* was technically interesting because of its retrospective manner of telling and for the excellence of its dialogue. Monica Stirling in *Some Darling Folly* showed a delicacy of perception recalling that of Elizabeth Bowen. It was a deceptively simple account of a married woman's love affair in Paris, told with great wit and insight. A new name, and one to be reckoned with, was that of Sybille Bedford, hitherto known only as the author of a travel book on Mexico. *A Legacy* was, in the opinion of several critics, the most interesting novel of the year. Elaborate in form, it dealt with life in a German family at the turn of the century, partly Catholic and aristocratic, partly Berlin-Jewish.

Three of the year's most impressive volumes came from the commonwealth. By the highest standards Patrick White's *The Tree of Man* was a fine achievement. A long novel about an Australian couple, it had a natural vigour and simplicity that set it apart from most contemporary fiction. John Hearne's *Stranger at the Gate* put him at the head of the younger school of Caribbean writers. Nadine Gordimer's *Six Feet of the Country* was a collection of short stories worthy of a fellow countryman of Olive Schreiner and Pauline Smith.

The year produced the usual crop of historical novels, of which incomparably the best was Mary Renault's *The Last of the Wine*, a most impressive reconstruction of life in the Athens of Alcibiades.

In the field of comedy P. G. Wodehouse's *French Leave* showed no fading of an ever green talent; but Iris Murdoch's eagerly awaited *The Flight From the Enchanter*, while giving evidence on every page of a sharp intellect at work, failed in its final effect, as the object of her satire remained in doubt. Honor Tracy's *The Straight and Narrow Path* was a comedy on stock Irish themes, but the freshness of its approach to the well-worn subjects of local credulity and petty corruption lifted it above its fellows. Hugo Charteris' *Marching with April* was a farcical satire on life in the Highlands, written with the greater distinction. Two new writers took Malaya as their theme. Mary McMinnies in *The Flying Fox* displayed an enviable gift of characterization that never degenerated into caricature, and Anthony Burgess on a smaller scale produced the sharply-etched *Time for a Tiger*. (J. D.)

Poetry.—Future historians, looking back on a not very exciting year, may decide that the most significant poetic event of 1956 was the publication of *New Lines*, edited by Robert Conquest. This anthology of nine poets, all of whom found themselves not earlier than the late 1940s, was by no means representative of the whole poetic scene, but it did seem to express the prevalent mental attitude of the fifties rather as *New Signatures* had spoken for the 1930s. Eschewing all extravagant gestures, tidy in technique and cultivating "the plain style," these new poets undoubtedly reflected in their work something of the spirit of the times.

To judge a poet by his anthology pieces is not, however, alto-

gether fair. Fortunately several of the poets in *New Lines* brought out individual volumes during the year. John Wain (*A Word Carved on a Sill*) and Kingsley Amis (*A Case of Samples*), while interesting, intelligent and sometimes enjoyable, seemed to many readers to reduce much of their poetry to a kind of intellectual exercise or academic joke. D. J. Enright (*Bread Rather Than Blossoms*), a less tidy and more travelled writer than these two, avoided this rather arid approach. But the most widely acclaimed and accessible poet in this group was undoubtedly Philip Larkin, whose *The Less Deceived* appeared late in 1955. This most attractive collection promised well for its author's future.

Of other volumes published in 1956 the most notable were *One Foot in Eden* by Edwin Muir and *Collected Poems* by Kathleen Raine. The intuitive, far-ranging vision of these two poets emphasized the rather poverty-stricken imagination of many of their younger contemporaries. Two other poets of unashamedly romantic temperament were Thomas Blackburn (*In the Fire*) and W. S. Merwin (*Green With Beasts*).

Other volumes of merit and interest included *The River Steamer* by E. J. Scovell, a poet of loving observation and true feminine grace; *The Scale of Things* by Patric Dickinson, a more varied volume than previous ones by this poet; and Kathleen Nott's *Poems from the North*. In a year rich in anthologies, mention must be made of (apart from *New Lines*) *The Chatto Book of Modern Poetry 1915-1955*, edited by C. Day Lewis and John Lehmann, and *Poetry Now*, edited by G. S. Fraser.

(See also AMERICAN LITERATURE; CHILDREN'S BOOKS; LITERARY PRIZES.) (Jo. C. H.)

Entomology: see AGRICULTURAL RESEARCH SERVICE; AVIATION, CIVIL; BACTERIOLOGY.

Epidemiology.

Epidemiology has had its most frequent application in the field of communicable disease, but by 1956 there was an increasing awareness that this same approach had application in many other spheres. One such case was the use of epidemiological principles in the investigation of motor vehicle accidents. Studies were under way to demonstrate the factors (human, mechanical and sociological) most involved in the occurrence of vehicular accidents.

Epidemiological methodology also was being employed in the study of chronic diseases such as coronary heart disease. Men are more likely to develop coronary heart disease than women. This difference is most striking for those below the age of 60. The number of deaths reported caused by heart disease had increased considerably in past decades in the United States and several European countries, and this apparent increase in the disease may not have resulted entirely from improved diagnostic procedures and patterns of diagnosis by physicians because women seemed to be involved to a less extent. Evidence derived from both epidemiological and clinical studies was presented which suggested that people who eat a high proportion of fat in their diets are more likely to develop coronary heart disease. Persuasive evidence was presented recently that fats from animal sources are more to blame for coronary heart disease than fats derived from vegetable sources.

In the field of communicable diseases, many which were formerly of great importance in Europe and the Americas were being controlled or to a large extent were controllable through the use of antibiotics, vaccination and immunization. With the advent of the Salk vaccine, poliomyelitis was the most recent disease to be curbed.

Polio vaccine was used widely in certain parts of the world, principally in the western countries which suffered epidemics. The formalin-inactivated vaccine developed by Jonas Salk had been proved effective and safe but poliomyelitis had not disap-

peared from the countries where vaccine was used. The time lag in proceeding from an experiment to a routine program of public health departments and practitioners was, in part, responsible. Similarly, the transition from the rigidly controlled conditions of a field trial to mass use made it difficult to assess the exact degree of efficacy of the vaccine. It was believed that the vaccine was most effective when given in three injections, yet in the Massachusetts epidemic in 1955, which was caused by the Type I polio virus (the usual type implicated in paralytic polio), only one injection was 76% effective in preventing the more severe forms of paralytic polio.

In the United States the Salk vaccine was limited at first to the 5 to 9 year age group but as the supply grew more plentiful, it was extended to other ages up to 20 years. It was used to a very limited degree in ages 20 to 39 years. What had this vaccination program accomplished in the United States? The number of polio cases in 1956 was lower than in former years but this could be the result of natural fluctuations in the number of cases from year to year. It would be more profitable to consider in detail the experience in New York state. This experience did not include that of New York city which, being a large metropolis, had a somewhat different epidemiological pattern. It was estimated that 80% of the population in the state under 20 years of age had had at least one injection of vaccine, while more than half of these had two injections, but few had the complete series of three.

The age group 5 to 9 was particularly well covered. In comparison with the average experience in 1951 to 1953, the rate of paralytic polio in all ages decreased 73%. The decrease was greatest (82%) in ages 5 to 9, the group most thoroughly vaccinated. The rate fell also in adults, being actually 64% lower than the 1951-53 average.

It was difficult to assess how much of these decreases could be attributed to immunization and how much to natural annual fluctuations. In former years the ratio between children aged 5 to 9 and adults over 20 years of age was six to one. In 1956 the ratio was cut in half. It may well be that immunization of children had decreased the reservoir of virus in children, therefore decreasing the chances of disease in adults. If this were so, the rate in adults could not be used as a yardstick to measure how much polio there would have been in children had vaccine not been used. At any rate, it had been proved that the formalin-inactivated vaccine was safe and was effective in preventing paralytic polio, even though more effective vaccines, including the feeding of an avirulent live virus, might be developed.

As the acute communicable diseases were becoming to a varying extent controllable, heretofore unrecognized agents of disease and diseases themselves were uncovered. One such group of agents was the APC (adenoidal-pharyngeal-conjunctival) group of viruses, usually referred to as the adeno-viruses, some of which cause upper respiratory symptoms much like those of a severe cold.

Other such agents were the so-called "orphan viruses" (ECHO group; named from entero-cytopathogenic human orphan) which can produce the same symptoms as nonparalytic poliomyelitis and are usually referred to as aseptic meningitis. While these newly recognized disease agents do not usually produce illnesses of a dangerous nature, the illness produced can be acutely severe, and frequently there is the problem of differentiating them from diseases of more serious import. In most instances a conclusive diagnosis depends on laboratory determinations.

The diseases of international importance which caused sporadic outbreaks of epidemic proportions during 1956 included the following:

Cholera.—Cholera remained confined to Asia with an outbreak of epidemic proportions, beginning in May, occurring in

India. An unusually high incidence of cholera was reported from Pakistan during March and April.

Plague.—Sporadic cases of plague continued to occur in various South American and African countries. One case was reported in the United States in June. The disease continued to smoulder in Asia.

Smallpox.—Smallpox was epidemic in various cities of Brazil during the last quarter of 1955 and in certain Asian provinces during May and June 1956. The disease remained endemic in Africa with sporadic outbreaks of epidemic proportions. As of Nov. 1956 all areas of North America north of the Rio Grande had been free of smallpox for one year. The status of Mexico was uncertain because of incomplete reporting, but the disease is not common there.

Yellow Fever.—The expected movement of jungle yellow fever northward into Mexico had not occurred. The virus of yellow fever had been isolated from mosquitoes (*Haemagogus mesodentatus*) in Guatemala and from monkeys in Guatemala and Honduras. Sporadic cases had been reported from Africa. The *Aedes aegypti* mosquito, which is the vector of this disease in its spread to man, is indigenous as far northward as the southern portion of the United States. Vaccination against yellow fever and eradication of the *Aedes aegypti* mosquito still constitute the best means of control of the spread of this disease.

Typhus, Epidemic.—Typhus fever (louse-borne) was reported from Africa, Asia, South America and Mexico during 1956. Delousing with DDT powder and vaccination of persons in endemic regions were the chief means of control of this disease.

Sporadic cases of endemic typhus (flea-borne) were reported in the United States during 1956. In the natural history of this form of the disease, man is an accidental victim since the disease is usually spread from rat to rat by the rat flea and only occasionally to man by the rat flea or rat louse. It differs from the epidemic, louse-borne typhus in that the latter disease is spread from man to man by the human louse (*Pediculus humanus*) and man is the natural reservoir.

Influenza.—Type A influenza virus was found to be responsible for sporadic outbreaks of illness in the United Kingdom and in North America. During Dec. 1955 influenza infection was diagnosed in outbreaks of relatively mild intensity among children in scattered southern parts of England. Several weeks later, laboratory-confirmed cases of influenza A were detected in the United States, in California. In the early months of 1956, sporadic cases of influenza A and limited outbreaks were reported in Washington, D.C., New York, Pennsylvania, Ohio and Illinois. In the United States, mortality from all causes and from influenza and pneumonia did not reflect a high incidence of influenzal infection.

By contrast with the winter of 1954-55, influenza B infection was found only rarely. Influenza C infection was recognized and reported only once.

Infectious Hepatitis.—This disease, which is caused by a virus and primarily affects the liver, remained world-wide in distribution. There was an epidemic in Denmark, and Sweden, Norway and Israel also reported a sizable number of cases. An extremely extensive epidemic involving tens of thousands of cases occurred in India. The virus of infectious hepatitis was reported to be isolated for the first time. If this work could be confirmed, it might well represent a great forward step in the effort to understand this disease more fully and the means of its control.

Malaria.—Eradication campaigns directed at destroying the mosquito vectors of malaria through the use of residual DDT spray, swamp drainage and the use of oil on swamp regions which could not be drained continued in many parts of the world. The

disease continued to occur in many countries of South America; an epidemic occurred in Mozambique, Af., and the republic of Haiti also experienced a high incidence of the disease.

Rabies.—Ecologically rabies continued to be primarily a problem of various species of wildlife but it also affects domestic animals and humans. The second and third cases of laboratory-confirmed rabies in a rat were reported in April 1956 from Nebraska and Louisiana. The first such case occurred in Georgia in Oct. 1955. For the first half of 1956, skunks accounted for about a third of the total rabid animals found in California. In several parts of the United States, wild foxes represented the chief species of wildlife which were rabid in nature. In Jan. 1956 a fatal case of rabies was reported from Texas of an entomologist who was engaged in research on bat rabies. Rabid bats were reported from Texas, California, Florida, Louisiana, Montana, New Mexico, Ohio and Pennsylvania between June 1953 and Nov. 1955.

(See also POLIOMYELITIS; PUBLIC HEALTH SERVICE, U.S.; RESPIRATORY DISEASES; TROPICAL DISEASES; VENEREAL DISEASES; WORLD HEALTH ORGANIZATION.) (H. E. HI.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Antibiotics* (1952); *Bacteria—Friend and Foe* (1954); *City Water Supply* (1941); *Defending the City's Health* (1941); *Immunization* (1955).

Episcopal Church: see PROTESTANT EPISCOPAL CHURCH.

Eritrea: see ETHIOPIA.

Estonia. A Soviet Socialist republic, Estonia is bounded north by the Gulf of Finland, east by the Russian F.S.R., south by Latvia and west by the Baltic sea. Area: 17,400 sq.mi. (18,359 sq.mi. before 1940). Pop. (1956 est.) 1,100,000. Languages: Estonian and Russian. Religions: Lutheran and Greek Orthodox. Chief towns (pop., 1939 est.): Tallinn (cap.) 146,400 (1956 est., 257,000); Tartu 60,100; Kohtla-Järve (1950 est.) 30,000. First secretary of the Estonian Communist party in 1956, Ivan Kabin; chairman of the presidium of the supreme soviet, August Jakobson; chairman of the council of ministers, Aleksey Muurisepp.

History.—In Feb. 1956 the 20th congress of the Communist party of the Soviet Union granted to Soviet republics greater autonomy in the field of economic planning. As a result, a common railway and sea transport administration for the Baltic republics was dissolved and three separate administrations were formed. Writing in the *Izvestia* (Sept. 22), Muurisepp claimed increased efficiency of Estonian railways and sea transport and greater productivity of Estonian agriculture.

An official report said that by Oct. 20 Estonia had supplied the state 262,000 metric tons of milk; i.e., 62,000 tons more than was planned for 1956 and 78,000 tons more than had been supplied by the same date in 1955. It was expected that by the end of 1956 Estonian collective and state farms would supply an additional 40,000 tons of milk. The average amount of milk per cow was 1,745 kg. in the collective farms and 2,958 kg. in the state farms.

Kustaa Wilkuna, a Finnish folklore expert, who in April had spent five days in Estonia, said in a press interview that about 100,000 Estonians who had been deported to the U.S.S.R. in Marxist and Stalinist times had returned home. Tallinn had been well rebuilt, but in Tartu, which had been more than half destroyed in 1944, rebuilding was still going on.

On Sept. 1 the 700th anniversary was celebrated of the foundation of the city of Narva.

(See also LATVIA; LITHUANIA.)

(K. SM.)

Education.—Schools (1950): primary 1,148, pupils 142,500; secondary, pupils 13,500; vocational, pupils 14,000. In 1953 Estonia had 7 institutions of higher education with about 10,000 students.

Finance.—Budget: (1955 est.) balanced at 1,161,466,000 roubles; (1956) balanced at 1,280,457,000 roubles.

Ethiopia. An independent empire of northeastern Africa, including (from Sept. 15, 1952) the autonomous province of Eritrea, Ethiopia is bounded west by Sudan, north-east by the Red sea, French Somaliland and (British) Somaliland Protectorate, and southeast and south by (Italian) Somaliland trust territory and Kenya. Area: 457,142 sq.mi., including Eritrea (47,876 sq.mi.). Pop. (1954 est., no census ever taken): 16,000,000, including Eritrea (1,000,000). Language: Amharic, official language; also Galla, Tigrinya, Tigré, Somali, etc. Religion: Christian Monophysite (in communion with the Egyptian Coptic Church) 57%; Moslem 20%; other 23%. Chief towns (pop., 1951 est.): Addis Ababa (cap.) 401,915; Asmara 117,000; Harar 45,000; Dessye 35,000; Dire-dawa 30,000. Ruler, Emperor Haile Selassie I; premier in 1956, Bitwoded Makonnen Endalkatchou; chief executive in Eritrea, Asfaha Woldemikael.

History.—Ethiopia took a prominent part in the early stages of the Suez canal controversy in 1956, and the foreign minister attended the two London conferences. He was a member of the committee which presented the proposals of the conference to Pres. Gamal Abdel Nasser in Cairo, but Ethiopia did not join the Canal Users' association. The government announced in February that surveys of the Blue Nile river basin were being made and that international bids would be invited for hydroelectric and irrigation projects. An active part was taken in all United Nations affairs.

The 1954 Anglo-Ethiopian agreement, which restored to Ethiopia the administration of certain areas of the Ogaden province, encountered difficulty over British-protected Somalis, which excited criticism of Ethiopia in the British press. The emperor went to Ogaden in August and made a speech which emphasized the need for unity among all Ethiopian peoples and, with reference to the Italian trust territory of Somalia, asserted that all Somalis were economically linked with Ethiopia.

A harmonious settlement of affairs with Italy made further progress. A reparations agreement was concluded in March, and negotiations were opened in Addis Ababa for the delimitation of the Somali-Ethiopian frontier. The agreement provided for payments by Italy, including finance for a big hydroelectric project, the provision of ships, factories and public works and restitution of historical objects.

Missions arrived from the International Bank for Reconstruction and Development and the Export-Import Bank of Washington. The former was concerned with a projected loan for road and port construction and the latter with a loan for airfield development. Point Four assistance from the United States continued to expand, and agreements were signed embracing additional projects of public administration, education and development of natural resources.

Economically, the country continued to progress. Trade was good, and exports of coffee, the principal commodity, were satisfactorily maintained though slightly smaller than in preceding years. Other exports were steady. Foreign monetary reserves increased, but the Suez canal closure in November resulted in a restriction of shipping for exports.

In Eritrea, in elections to the second four-yearly legislature, most members were elected for a second term, and the retiring chief executive and the president of the legislative assembly were unanimously re-elected.

(F. E. ST.)

Education.—*Ethiopia:* Schools (1953-54): government primary 431, pupils 69,081, teachers 2,372; government secondary and vocational 11, pupils 2,155, teachers 117; private (all levels) 79, pupils 8,675. Teacher training colleges 2, students 533. Institutions of higher education 3 (including 1 university college), students 475 (including 200 at university college extension classes), teaching staff 34. *Eritrea:* Schools (1952): primary 100, pupils 13,500; secondary and technical 16, pupils 1,367. One teacher training college with 80 students.

Finance and Banking.—Monetary unit: Ethiopian dollar, with an exchange rate of Eth. \$2.50 to the U.S. dollar. Budget: *Ethiopia* (1954-55 est.; 1953-54 est. in parentheses): revenue Eth. \$108,000,000 (Eth. \$121,340,

000); expenditure Eth. \$108,170,341 (Eth. \$121,295,606). *Eritrea* (1956-57 est.; 1955-56 est. in parentheses): revenue Eth. \$12,978,102 (Eth. \$12,623,462); expenditure Eth. \$12,952,456 (Eth. \$12,610,018). Currency circulation: (Dec. 1954) Eth. \$118,682,613, (Dec. 1953) Eth. \$114,600,000. Deposit money: (Dec. 1954) Eth. \$119,801,764, (Dec. 1953) Eth. \$103,000,000.

Foreign Trade.—(Sept. 1954-Sept. 1955): Imports Eth. \$162,560,000; exports Eth. \$154,010,000.

Transport and Communications.—*Ethiopia*: Roads (1955): first class 4,075 km.; others 10,622 km. Motor vehicles in use (1954): passenger cars 8,300; commercial vehicles 3,700. Railways (1956) 784 km. Air transport (*Ethiopian Airlines*, 1955): 48,852,000 passenger-km.; cargo, 2,808,000 ton-km. Telephones (Jan. 1955) 5,825. *Eritrea*: Roads (1955): first class 889 km.; others 2,240 km. Railways (1956) 306 km.

Agriculture.—Main crops (metric tons, 1955; 1954 in parentheses): barley 600,000 (600,000); rapeseed 20,000 (20,000); sunflower seed 10,000 (10,000); dry beans 75,000 (75,000); sesame 35,000 (35,000); lentils 75,000 (75,000); (1954) millet (*Ethiopia*) 1,660,000, (*Eritrea*) 60,000; coffee 45,800; bananas 20,000; wheat (*Ethiopia*) 175,000, (*Eritrea*) 2,000; maize (*Ethiopia*) 150,000, (*Eritrea*, 1953) 20,000; chick-peas (1953) 6,000.

Ethnology: see ANTHROPOLOGY.

Euratom: see ATOMIC ENERGY; EUROPEAN UNITY.

European Coal and Steel Community: see EUROPEAN UNITY.

European Defense Community: see ARMIES OF THE WORLD; EUROPEAN UNITY; NORTH ATLANTIC TREATY ORGANIZATION.

European Payments Union: see EXCHANGE CONTROL AND EXCHANGE RATES.

European Unity. Since the end of World War II the idea of strengthening Europe by a union of the various European countries has occupied much public attention. The year 1952 marked the high point on the road to European unity. In that year the European Coal and Steel Community (E.C.S.C.) was set up and the treaties establishing the European Defense Community (E.D.C.) were signed. In the same year it was proposed to draft a treaty establishing a European political community. Since that time no real progress on the road to European unity has been achieved.

The E.D.C. was rejected by France and was replaced by the Western European union (W.E.U.) for common military defense, a union consisting of Great Britain and the six nations of the European Coal and Steel Community—France, Italy, the German Federal Republic, Belgium, Luxembourg and the Netherlands.

The Council of Europe.—The largest of the various European organizations is the Organization for European Economic Co-operation (O.E.E.C.), of which Austria, Belgium, Denmark, France, the German Federal Republic, Greece, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Sweden, Switzerland, Turkey and the United Kingdom belong and of which Canada and the United States are associated members. The second largest organization is the Council of Europe, with its seat in Strasbourg, Fr. The council, which is purely advisory, considers such matters as European co-operation in economic, social and political affairs. It was enlarged when Austria joined the other 15 members in April 1956. By that step Austria, until recently partly under Soviet occupation, joined western Europe, and although militarily neutral, showed that spiritually it belongs to the west.

The door of the Council of Europe has always been left open since the organization was formed, to admit nations from the area called eastern Europe, in the hope that with the rolling back of the "iron curtain" the division of western and eastern Europe will cease.

The second important event at the April 16-23 session of the Council of Europe's Consultative Assembly was the election by acclamation of the Belgian senator, Fernand Dehousse, as president of the Assembly to replace Guy Mollet who was soon to become French prime minister.

The Council of Europe also adopted its own flag, with 12 gold stars forming a circle in the centre of an azure blue field. The stars were always to be 12 in number, not to indicate any number of member states, but because 12 is regarded as a symbol of completeness and perfection.

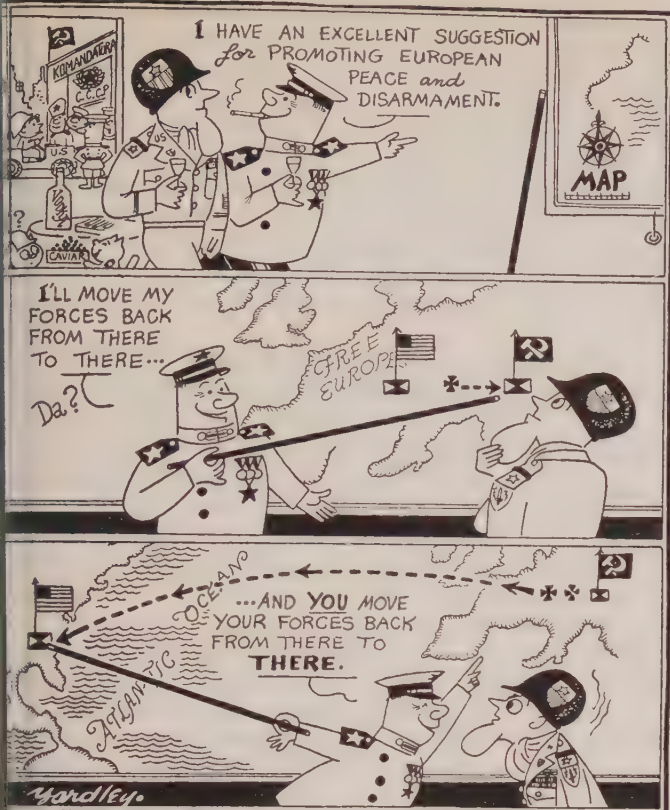
European Coal and Steel Community.—The European Coal and Steel Community is a much narrower unit than the Council of Europe, consisting of only six member states; but it represents a much closer approach to the goal of co-operation and integration than does the Council of Europe. In March 1956 the Common Assembly of the E.C.S.C., meeting at Brussels, Belg., approved the general principles of the proposed treaty for further economic integration, which would allow the establishment of a common market for the six nations. However, the problem of the integration of atomic energy led to a split between those who advocated private enterprise in the development of atomic energy and those who stood for collective enterprise. Some of the speakers also insisted that the treaty concerning atomic energy had to assure that the energy produced would be directed exclusively to peaceful uses.

The proposal for the creation of a common market envisaged its gradual establishment by reducing customs duties by 30% in four-year stages, by abolishing government subsidies, by the creation of a common investment fund and of another fund to finance retraining persons losing their jobs through economic integration.

EURATOM.—Serious consideration in the field of European unity was given during 1956 to the creation of a supranational atomic energy community (EURATOM) established among the six nations of the E.C.S.C., but opened to Great Britain and others to join. The Action Committee for the United States of Europe, which was formed by Jean Monnet at the end of 1955 concentrated on seeking rapid agreement on a definite project to pool atomic energy resources and their development in western Europe. It suggested the formation of a high authority similar to that which directed the European Coal and Steel Community. Thus EURATOM could become a second step toward a European federation which was the avowed goal of Monnet's Action Committee. Europe is an energy-deficit area, and therefore large scale industrial application of the energy released by nuclear fission is of vital importance. The situation was much aggravated by the Suez canal crisis in the fall of 1956, which dramatized the need for additional energy sources for Europe. The Suez canal crisis threatened the regular delivery of middle eastern oil to western Europe where it was most urgently needed to make up for the growing coal deficit. Although nuclear power could not be developed quickly enough under any circumstances to be of immediate help, it would nevertheless have great long-range importance, to diminish the growing dependence of western Europe on outside sources for its supply of power. By the end of Sept. 1956 five of the six parliaments (all but that of Italy) of the proposed member nations of EURATOM had adopted resolutions approving, in principle, the pooling of their atomic resources.

In this connection it may be noted that there exists a European Organization for Nuclear Research (C.E.R.N.) with its seat in Geneva, Switz., but this centre is exclusively dedicated to research. It was expected that its smaller synchro-cyclotron would be ready for use in 1957 and that its proton synchrotron, which would be the largest in Europe, would be in operation by 1960. Twelve member states, including Switzerland, participate in C.E.R.N.

EURATOM and Great Britain.—The United States pledged its support to the projected European Atomic Energy Authority in Feb. 1956 during a visit of René Mayer, chairman of the High Authority of the E.C.S.C., to Washington, D.C. Pres. Dwight D.



RUSSIA'S 'GENEROUS' OFFER," a cartoon of 1956 by Yardley of the Baltimore Sun (Md.)

Eisenhower assured Mayer that the United States would support any form the European nations might choose for their atomic energy co-operation. Great Britain, however, was more reluctant in its support at the beginning, fearing that a supranational economic grouping on the continent would tend to discriminate against countries outside the grouping. Great Britain favoured a program without supranational controls, allowing considerable flexibility to the member countries. Instead of joining the projected EURATOM. Great Britain proposed a form of association through the wider channel of the Organization for European Economic Co-operation. In July 1956 the council of the O.E.E.C. at its meeting in Paris, Fr., decided to set up a steering committee for nuclear energy, to devise a system of security controls for the nuclear undertakings in which European nations could join to form a limited pooling of their efforts, and to co-ordinate whatever joint nuclear programs might emerge. Efforts were made to conciliate the two opposite points of view, a supranational pool covering the whole nuclear field (as proposed by the six E.C.S.C. nations) and of less extensive co-operation for specific limited projects. It was suggested that the six nations build their own isotope separation plant while sharing a plant for the chemical treatment of irradiated fuels with the other nations. On the other hand, the same council meeting of the O.E.E.C. witnessed a more favourable British attitude toward the plan for creating a common European market and a free-trade area in Europe as distinct from a customs union. In that way Great Britain could retain its imperial preference tariffs.

Western European Union.—The Western European union (W.E.U.) to which the six nations of the E.C.S.C. and Great Britain belong took the first steps in 1956 toward an initiative in the control of arms production of the seven member nations. On Sept. 15, 1956, the W.E.U. council met in Paris. It was called at the suggestion of the German Federal Republic whose government was alarmed by the rumour of long-range intentions of the United States and British governments to reduce their armed

forces stationed in western Germany. The council meeting agreed that a prior accord had to precede any reduction of conventional armed forces in favour of nuclear weapons. Representatives of the United States and Canada attended the meeting as observers. It was generally agreed that the problem of reduction of ground forces should be discussed together by the western allies and a general agreement reached before any one nation made a decision. In any case the over-all strength of the western alliance should be maintained, although the nature of this strength could change in the future according to technical studies which were being carried out. In this respect, the functions of the Western European union tended to merge into those of the North Atlantic Treaty organization (NATO), in which all the member nations participated.

At the beginning of October new moves were made to strengthen western European union. The reasons for these moves were twofold: the revelation of Europe's weakness in the Suez canal crisis, and the agreement between France and the German Federal Republic about the future of the Saar territory. The west German chancellor, Konrad Adenauer, stressed in Oct. 1956, that a united and independent Europe would be a powerful factor, independent from the Soviet Union, but also independent from the United States. Adenauer made the point that such a united Europe had been for many years the goal of United States policy. He also stressed the need to unite not only the six countries of the E.C.S.C. but to create a link between Great Britain and a federally united Europe. At the same time Great Britain moved nearer to the acceptance of a proposal to create a free-trade region linking western Europe with Great Britain and, if possible, with nations of the British Commonwealth. Great Britain would thus form the link between western Europe and the Commonwealth. It was hoped that such a new form of co-operation would restore the positions of influence of Great Britain and Europe in world affairs. On the other hand, Italian Foreign Minister Gaetano Martino, in opening the discussion of Italian foreign policy before the Italian parliament at the beginning of October, stressed the need of a wider western solidarity. He warned that "otherwise we shall be exposed, one by one, to attacks carried out by political means. It is, therefore, necessary to devise new instruments of western collaboration more adequate to face a new situation."

(See also ARMIES OF THE WORLD; FOREIGN AID PROGRAMS, U.S.; NORTH ATLANTIC TREATY ORGANIZATION.)

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Events of the Year: see CALENDAR OF EVENTS, 1956, pages 65–80.

Exchange Control and Exchange Rates.

In 1955 and the first half of 1956 there were few changes of major importance either in exchange rates or in exchange control systems. On the whole, production and trade continued to expand, and conditions approaching full employment prevailed in many countries. Indeed there was a growing tendency for aggregate demand to outrun the supply of goods and services, and signs of inflation appeared in several countries.

The signs of strain were particularly clear in the sterling area, in France, in Turkey and in various Latin-American countries which had been unable by either fiscal or monetary measures to adjust domestic demand to changes in foreign exchange earnings.

In Europe the European Payments union continued to function smoothly, there were no important exchange rate changes,

and some measures of detail were taken, notably in Belgium-Luxembourg, Germany and the Netherlands, to ease restrictions on the use of foreign exchange. In Latin America the devaluation of the peso in Argentina and the partial depreciations in Chile and Uruguay were the most significant developments. In the middle east the unification of the Iranian exchange rate structure was a noteworthy improvement. In the far east the continued improvement of economic conditions brought some easing of exchange restrictions in Japan, while in Indonesia they were tightened in response to renewed balance of payments difficulties.

United States.—Since World War II the U.S. payments position had been a decisive factor in the stability of many other countries throughout the world. In the last year or two, however, the rest of the world had shown itself better able to withstand the shock at least of moderate business fluctuations in the United States. This was so not only because of increasing economic strength abroad. Imports of goods and services were also becoming more important to the United States while dollar payments by the U.S. government to foreign countries were considerably larger than before the war and were not directly affected by business conditions. Further, U.S. income from investment abroad was now derived to a much greater extent from direct investments and was therefore much more flexible than service on fixed-interest obligations. In the first half of 1956, as in 1955, foreign countries as a whole continued to strengthen their positions by accumulating gold and dollar assets through transactions with the United States, while the gold stock of the United States remained virtually stationary. The U.S. dollar still stood at a substantial premium in the free foreign exchange markets of various countries. As in 1955, however, that premium reflected unfavourable economic conditions in the country in question rather than a general imbalance in payments between the United States and the rest of the world.

Canada.—As it had done for several years, Canada continued to allow the exchange rate to be determined by free market forces. Indeed, in March 1956 the government removed the last restrictions on transactions in gold. In the latter part of 1955 and the first months of 1956, its balance of payments position was rather less favourable. For 1955 as a whole, Canada's deficit on current account was \$665,000,000, against \$431,000,000 in 1954. At the same time the inflow of long-term capital showed a tendency to slacken as the interest rate spread between Canada and the United States narrowed. As a result Canadian reserves of gold and U.S. dollars declined slightly from the end of Sept. 1955 to the end of April 1956 and, reflecting these changes, the exchange rate for the Canadian dollar drifted downward to around par with the U.S. dollar in the winter of 1955 and spring of 1956 for the first time in more than two years. In the second quarter of 1956, however, Canadian long-term capital receipts rose again, and despite a continuing large import surplus, the fall in gold and U.S. dollar reserves stopped, and they stood at \$1,904,000,000 at the end of July compared with \$1,946,000,000 in Sept. 1955. The exchange rate for the Canadian dollar rose appreciably again and stood at U.S. \$1.02 per Canadian dollar at the end of July.

Latin America.—Because of deteriorating terms of trade, failure to provide adequate incentives to producers of agricultural exports and a continuing inflation, the international economic position of Argentina had worsened steadily in the last few years. On Oct. 27, 1955, Argentina announced a substantial devaluation of the peso. A single official exchange rate of 18 pesos per U.S. dollar replaced the former multiple rate structure, and a free exchange market was established to be applicable to minor exports, capital goods imports, payments

for services and capital transactions. In order to allow for future cost increases the full benefit of the devaluation was not passed on to the exporters of major agricultural products: taxes of 25% being levied on exports of greasy wool, cattle hides and hogs, 15% on meat and dairy products and wool tops and 10% on cereals, linseed and cotton. The free rate fell steeply at first, reaching 42 pesos per dollar by the end of Feb. 1956, but it subsequently recovered sharply as the minor exports were stimulated, imports were still kept on an austerity basis, and some foreign capital began to flow into the country again. On Aug. 6 the free peso was quoted at 28 to the dollar in New York.

Over the past years Argentina had accumulated very substantial debts to western European countries, and in some cases the repayment of these debts was restricting exports from Europe to Argentina. To facilitate the settlement of them, multilateral payments arrangements were set up in July 1956 with the so-called Paris club, comprising Austria, Belgium, Denmark, France, the Netherlands, Norway, Sweden, Switzerland, the United Kingdom and, later, Italy. All payments and collections with these countries could be in any of their currencies, which were therefore transferable among them.

The exchange system in Bolivia remained substantially unchanged. All exports were made by government agencies, while importers had to purchase exchange at the official rate of 190 bolivianos per U.S. dollar plus import surcharges ranging up to 15 times the official rate. However, the persistent weakness in the country's international economic position was reflected in the continued steep rise in the free rate, applicable to invisible transactions, from 3,600 bolivianos per dollar at the end of Sept. 1955 to no less than 7,360 per dollar by the end of June 1956.

In Brazil inflationary pressures persisted, originating largely from budget deficits and the expansion of bank credit. With imports restricted for lack of foreign exchange, however, and with coffee exports to the United States recovering, the balance of payments position improved somewhat, and foreign exchange reserves tended to rise in the first half of 1956. There were no important changes in the system of multiple exchange rates, but the weakness of Brazil's position was reflected in the continuing tendency for a greater proportion of exports to be sold at the more depreciated rates. The free rate also declined in the first half of the year and stood at 76 cruzeiros to the dollar at the end of July. The multilateral payments arrangements made in Aug. 1955 between Brazil on the one hand and the United Kingdom, Germany and the Netherlands on the other were extended to Belgium in Nov. 1955. This system, known as the Hague club, came into being for the same reasons as the multilateral payments arrangements made by Argentina with western European countries.

For several years inflation had put a continuous strain on the Chilean balance of payments, and in 1955 a partial depreciation of the peso had been carried through, with most transactions taking place at 300 pesos to the dollar. In the spring of 1956 the government instituted credit controls and wage policies to curb the inflation, and following this a system of free exchange rates was introduced in April 1956, replacing the multiple rate structure previously in effect. The principal free rate, applicable to all exports, imports and a few capital transactions, fluctuated between 490 and 495 pesos per dollar in the summer, while the other free rate, used for tourist expenditures and most capital transfers, moved above 500.

Since the fall of 1954 when coffee prices had declined somewhat from their extraordinarily high level, the international economic position of Colombia had remained rather precarious. The multiple exchange rate structure was maintained in 1955, and

In October the proportion of imports coming in at the free and more depreciated rate was greatly increased. There were still large commercial arrears, and importers had to wait about six months to obtain the exchange required to make their payments. In July the Colombian authorities offered importers with applications for foreign exchange pending the immediate allocation of exchange at the current official rate of 2.50 pesos per dollar for half their pending allocations, provided that they purchased the rest in the free market at a rate then about 4.60 pesos per dollar. If they preferred to wait their turn, they would receive the whole amount at the official, and of course very much more favourable, rate.

Ecuador's position was also weak, and in late 1955 and early 1956 exchange reserves, which were already at a low level, declined still further. To halt this the authorities took various measures mainly to restrict imports by either prohibiting certain categories or allowing them to come in at the free and more depreciated rate. This rate, which was affected by the intervention of the authorities to prevent speculative movements, dropped from 17.35 sucres per U.S. dollar at the end of Sept. 1955 to 18.62 at the end of July 1956.

As of March 1, 1956, Paraguay established a new par value of 50 guaranies per U.S. dollar, replacing the former par of 21 guaranies. At the same time the complicated multiple rate system, which had involved discrimination among currencies as well as among categories of payments, was greatly simplified. The new rate was applicable to all exports and government transactions, to payments for essential imports and certain services. For nonessential imports an exchange surcharge of 25 guaranies per dollar was temporarily imposed, while capital transactions and other services took place at the free market rate which stood at 120 guaranies per dollar at the end of June.

Despite the measures taken earlier in 1955 to avert a loss in reserves, Uruguay's foreign exchange position remained unfavourable. To encourage various exports (for instance, wool exports) premiums were given for exports of them. Then on Aug. 4, 1956, a new system, basically a partial depreciation, was introduced. It established a certificate market for all commercial transactions, exporters of different products being permitted to retain a varying percentage of their foreign exchange earnings which they would sell to importers of goods other than those deemed essential.

Sterling Area.—In the first half of 1955 the position of sterling had deteriorated sharply. Although monetary measures had been taken in the United Kingdom to halt the decline in reserves, the gold and dollar holdings of the sterling area, held

by the U.K., continued to fall till the end of the year, when they stood at \$2,120,000,000, only \$120,000,000 above the level generally regarded as critical. Part of this fall was seasonal, for exports of important sterling commodities are concentrated in the first half of the year, but the fact that they rose only to \$2,405,000,000 at the end of July, and dropped by \$129,000,000 in August, the first month of the Suez canal crisis, was indication enough of the continuing strain. Exports continued to rise, but imports kept pace; the opinion grew that the steps taken in 1955 were not drastic enough, and it occasioned no surprise when in Feb. 1956 the Bank of England raised the rediscount rate again, to the very high level of 5.50%.

These developments were reflected in the continued weakness of sterling exchange rates. Though the selling rate for U.S. account sterling firmed slightly from \$2.79 per pound sterling at the end of Sept. 1955 to almost \$2.81 at the end of Feb. 1956, it had dropped again in July and August practically to \$2.78, the lower of the limits within which it was permitted to move. Indeed, it was reported that on some days in August official intervention had been necessary to prevent the rate's falling below that point. Movements in rates for transferable and security sterling were similar; in the spring the gap between them was smaller than it had hitherto been, suggesting a greater measure of interchangeability. In the early summer, however, the spread widened again. The sterling rate for purchases of dollar securities showed further weakness, falling by the end of July to \$2.66 per pound sterling, while the authorities had to support the transferable rate in order to hold it above \$2.75.

Among the other sterling area countries Australia was still beset by balance of payments difficulties. The measures taken in Oct. 1955 to reduce aggregate demand and restrict imports did not prove sufficient, and Australia's international reserves, largely held in sterling, fell from the equivalent of \$721,000,000 at the end of Sept. 1955 to \$579,000,000 at the end of April 1956. Widespread increases in indirect taxes were therefore introduced in March, further restrictions in imports at the beginning of July, while exchange allowances for Australian tourists in the sterling area were reduced. By the middle of the year the decline in reserves appeared to have been halted.

Pakistan had devalued the rupee in 1955. In October of that year the government introduced a retention quota scheme, allowing exporters of some commodities to keep certain percentages of their earnings of foreign exchange and use them to purchase specified imports.

Continental Europe.—A steady demand for steel and capital goods reinforced the already strong international economic position of Belgium-Luxembourg. This was reflected in the tendency for the official rate to move toward 49.50 fr. per U.S. dollar, the lower limit within which fluctuations were permitted. Following the measures taken in 1955 to free foreign exchange transactions, particularly capital transfers, the monetary authorities, as of Jan. 1, 1956, lifted restrictions on dealings in gold. Payments for international transactions in gold had to be made either in bank notes or through the free exchange market, in which quotations for the dollar were, how-

Exchange Rates of Selected Countries
(In cents per unit of foreign currency)

Country	Unit quoted and type of exchange	Annual average rates			Monthly average rates, 1956		
		1938	1954	1955	January	April	July
Argentina	Peso						
	Basic	32.60	20.00	20.00*	5.56	5.56	5.56
	Preferential	—	13.33	13.33*	—	—	—
Australia	Free	—	7.20	7.18*	2.59	2.54	3.09
	Pound	389.55	223.80	222.41	223.63	223.72	222.58
Austria	Schilling	—	3.86	3.86	3.86	3.86	3.86
Belgium	Franc	3.38	2.00	1.99	2.00	2.00	2.01
British Malaya	Dollar	—	32.64	32.62	32.82	32.76	32.51
Canada	Dollar	99.42	102.72	101.40	100.12	100.30	101.83
Ceylon	Rupee	—	21.02	20.89	21.02	21.02	20.92
Denmark	Markka	—	0.44	0.44	0.44	0.44	0.44
France	Franc	2.88	0.29	0.29	0.29	0.29	0.29
Germany (Fed. Rep.)	Deutschmark	—	23.84	23.77	23.72	23.72	23.84
Greece	Rupee	36.59†	21.02	20.89	21.02	21.02	20.91
Ireland	Pound	—	280.67	279.13	280.66	280.77	279.33
Mexico	Peso	22.12	9.05	8.01	8.01	8.01	8.01
Netherlands	Guilder	55.01	26.38	26.23	26.12	26.12	26.11
New Zealand	Pound	392.35	278.09	276.36	277.88	277.99	276.57
Norway	Krone	24.57	14.01	14.01	14.01	14.01	14.01
Philippine Republic	Peso	—	49.68	49.68	49.68	49.68	49.68
Portugal	Escudo	4.43	3.49	3.49	3.49	3.49	3.49
South Africa	Pound	484.16	279.82	278.09	279.61	279.72	278.29
Sweden	Krona	25.20	19.33	19.33	19.33	19.33	19.33
Switzerland	Franc	22.87	23.32	23.33	23.33	23.33	23.33
United Kingdom	Pound	488.94	280.87	279.13	280.66	280.77	279.33

*Annual averages based on quotations through Oct. 27, 1955; monthly averages for October for these rates were the same as those for September.
†Including Pakistan.

ever, only very slightly higher than the official rate. With this action Belgium and Luxembourg had restored complete freedom for capital transactions in foreign exchange and in gold.

In Finland the practice of quoting fixed buying and selling rates for various western European countries was abolished on Jan. 1, 1956. This move was made possible by the substitution of agreements providing for some degree of transferability for the purely bilateral agreements between Finland and these countries.

The international financial position of France, which had improved considerably in 1955, deteriorated sharply in 1956. The causes were several. The severe winter seriously affected agricultural production and made necessary large imports of wheat and other foods. The increased military effort in North Africa necessitated large imports and also withdrew labour from industry, and the strain on French resources was only too noticeably reflected in the upward movement of prices. At the same time prices of certain imported raw materials rose, while U.S. military aid declined. Gold and foreign exchange reserves, which had risen to \$2,120,000,000 at the end of 1955, had fallen to \$1,858,000,000 at the end of June, and the indications were that most of the \$750,000,000 increase registered in 1955 would be wiped out by the end of the year. In the circumstances it was not surprising that gold prices and black market rates for the franc rose, the rate for the U.S. dollar standing well above 400 by mid-year, compared with an official parity of 350.

The position of the Federal Republic of Germany, on the contrary, continued strong. Exports still rose faster than imports, and the rapid inflow of foreign exchange went on, stimulated in the early summer by unfounded rumours that a revaluation of the deutschemark was imminent, and also by an inflow of foreign short-term capital attracted to Germany by the relatively high interest rates prevailing. From \$2,969,000,000 at the end of Sept. 1955, the reserves of the Bank Deutscher Länder rose to \$3,449,000,000 at the end of May 1956. In that month the monetary authorities took certain measures to relax somewhat the exchange control regulations applicable to residents. They were given permission to purchase marketable foreign shares and bonds, and were allowed to maintain foreign exchange accounts for an unlimited period with the Foreign Trade banks. Whereas previously German residents had been allowed to hold such accounts for only six months, from May 6 on they had full freedom to decide whether and when to sell their foreign exchange to the central bank. This change caused a dip in the central bank's foreign exchange holdings in June, but this merely represented a shift of funds from it to the Foreign Exchange banks.

In Greece most of the few remaining exchange taxes on exports of olive oil were removed in Nov. 1955 in order to maintain prices and stimulate exports in the face of a considerable increase in output. In Jan. 1956 a significant change was made when imports of gold in all forms were freed from all exchange control or customs formalities. This measure was taken in order to limit profits from arbitrage operations with foreign markets and thus lower the domestic drachma price of the sovereign. As a result the discrepancy between gold prices in Greece and in foreign markets narrowed, but in July it was apparently still sufficient to make gold imports into Greece attractive.

In 1956 the Italian international economic position continued to improve. On June 8, 1956, a new decree law became effective, co-ordinating and simplifying the basic exchange control regulations. The new law also liberalized the system of payments by introducing a free market in Italy for foreign bank notes.

Some further steps were taken in 1956 to relax exchange controls in the Netherlands. As from Jan. 14, residents were allowed to purchase foreign securities without first having to obtain a licence, and the range of goods for which import or export

licences were required was considerably reduced, while on July 9 guilder balances were made more widely transferable with the establishment of the "transferable guilder area" covering not only the member countries of the European Payments union but also Brazil, Chile, Finland and certain other countries. Until early in 1956 gold and foreign exchange reserves, bolstered by foreign purchases of Dutch securities, remained at the substantial level of about \$1,300,000,000 in spite of an increasing trade deficit, but by the middle of the year the inflow of capital had ceased and reserves began to fall.

The international economic position of Turkey, which had deteriorated since 1954, did not improve in 1956. Although exchange controls were tightened, the balance of payments on current account still showed a very large deficit, commercial arrears had not yet been liquidated, and the value of the lira continued to fall on the black market. Whereas the curb rate for the U.S. dollar had stood at £T9.15 at the end of Sept. 1955, by the end of May 1956 it had fallen to £T12.80 per U.S. dollar compared with an official rate of only £T2.80.

Major changes were introduced in the Yugoslav foreign exchange system at the beginning of 1956. Exporters, who had previously been allowed to retain 10% of their export proceeds for their own use or for sale in the free market, were henceforth permitted to retain only 1% for their own use, and the free market was abolished. Foreign exchange had to be surrendered to the National bank at rates which varied according to the type of exports involved and was allocated to importers often at rates which varied with the nature of the goods to be imported. A 33½% premium was also henceforth applied to the official rate of exchange applicable to foreign tourist expenditures in Yugoslavia, resulting in an effective rate of 400 dinars per U.S. dollar compared with the par value of 300.

Far East.—A new currency, the riel, had been introduced in Cambodia, and on March 21, 1956, its gold parity was officially set at 25.3905 mg. of gold.

Indonesia's international economic position, which had improved in 1955, began to deteriorate again in 1956. From \$253,000,000 on Dec. 31, 1955, gold and convertible foreign exchange reserves had declined to only \$132,000,000 on July 11, 1956. The move to simplify the exchange rate structure was therefore reversed, and on Aug. 6, 1956, a new system of export inducement certificates was introduced. Export premiums on minor exports were abolished, and instead exporters received negotiable certificates equivalent to from 3% to 20% of their export receipts. These certificates could be used for invisible payments and to import goods for which exchange was not made available.

The foreign exchange position of Japan continued to improve in 1956. As a result, selected trading firms were permitted to hold foreign exchange on their own account, the foreign exchange market was extended to permit forward transactions, and in other ways also measures were taken to relax control over foreign exchange and normalize Japan's foreign exchange transactions.

A new currency, the kip, was introduced in Laos in Dec. 1955. In May 1956 the kip rate was at 5.50 French francs per kip in the Hong Kong free market.

The ties between the French franc and the Vietnamese piaster were also loosened. The convention fixing the exchange parity between the two currencies was abrogated as from Jan. 1, 1956, and an exchange market was established in Saigon. The official parity of the piaster remained at 35 per U.S. dollar; the free market rate opened at 72 piasters and subsequently rose to 74.5 piasters per dollar in August.

(See also GOLD; INTERNATIONAL MONETARY FUND; INTERNATIONAL TRADE; TARIFFS.)

(A. STE.)

Exhibitions: see FAIRS AND EXHIBITIONS; SHOWS.

Exploration and Discovery. The year 1956 saw a considerable amount of exploratory activity, of which the largest part was preparatory work for the International Geophysical year exploration in Antarctica. During 1956 several parties from various nations went to Antarctica to set up bases and otherwise prepare for the large operation in the following year. (For an account of these activities, see ANTARCTICA.)

Mountaineering exploration had a successful season. Mt. Everest was climbed for the second time on May 24, 1956, by a Swiss team which included veterans of previous climbs in the Himalayas. The Swiss group also climbed Lhotse, an adjacent high peak, on May 18. A Japanese party led by Yuko Maki reached the summit of Manaslu, 26,658 ft. high, on May 9. During the summer of 1956 Gasherbrum II in the Himalayas, which is 26,360 ft. high, was climbed by an Austrian party.

In the Andes, a Dutch party climbed Vicanota, Salcantay and Moray in Peru. A French expedition, led by Lionel Terray, climbed Charcaraju, a Peruvian peak 20,013 ft. high, in July. This mountain is considered to be extremely difficult. An Italian expedition was attempting Mt. Sarmiento in Tierra del Fuego. The peak is only 7,546 ft. high, but is heavily snow covered and has glaciers running down to the sea. The expedition included a geologist, a topographer and other scientific personnel. The mountain is considered one of the most difficult and inaccessible on the South American continent. Almost simultaneously, a Chilean army party led by Capt. René Cajardo climbed a peak named Ojos del Salado, which also lies in the main backbone of the Andes, inland from the town of Copiapó. Its summit is just inside Chilean territory. This party made a barometric determination of the altitude as 7,084 m., which if later proved correct would make the mountain slightly higher than Aconcagua's 6,960 m.

The year 1956 saw new records established in the geophysical exploration of the earth. An oil well drill reached a depth of more than 22,000 ft. below the surface of the ground, or somewhat more than 1,000 ft. farther than the previous record boring. The well was in Louisiana and started from near sea level. In the opposite direction, an unmanned balloon launched from Minnesota reached an altitude of 142,900 ft., a new record for a free balloon. The balloon carried cosmic ray equipment and other instrumentation, and was made of a thin plastic material, inflated with helium. The flight, made in September, was a part of the University of Minnesota (Minneapolis) cosmic ray research program.

Also in September a new altitude record for manned craft was established when a U.S. air force rocket-propelled Bell X-2 reached an altitude of approximately 124,000 ft. The pilot was Capt. Ivan C. Kincheloe. The flight took off from Edwards air force base in California. As usual, the rocket ship was attached to a larger ship, a Boeing B-50, and was cut loose when the carrier had reached about 30,000 ft. The new altitude record exceeded by far the previously announced records, and was almost as high as the unmanned free balloon record.

On Nov. 8, 1956, two U.S. navy balloonists soared to a record altitude of about 76,000 ft., breaking the former record for manned balloon flight of 72,395 ft. set in 1936. Lieut. Com. Malcolm D. Ross and Lieut. Com. Morton L. Lewis, riding in an aluminum globe beneath a helium-filled plastic balloon, took off near Rapid City, S.D., and landed about 140 mi. away in Nebraska.

Numerous other exploring expeditions were in the field during 1956, or had recently returned. A party of seven men under the leadership of Edward R. LaChapelle of Alta, Utah, embarked upon the ninth consecutive season of field work in the American geographical society's program of scientific studies on the Juneau

ice field in Alaska. As in several preceding seasons, the focus of the glaciological, seismological, meteorological and botanical investigations was Lemon Creek glacier; the Jamesway hut, located on the southeastern ridge that borders the glacier, was occupied during July and August.

Leonard J. Brass, associate curator in the department of mammals of the American Museum of Natural History, New York city, headed a scientific collecting team that planned to work for nine months in the eastern islands of the Papua area. The expedition was sponsored by Richard Archbold, a research associate of the American Museum of Natural History and president of Archbold Expeditions. The expedition planned to work first on Normanby and Fergusson Islands in the D'Entrecasteaux group, making extensive collections of mammals and plants. In addition to vascular plants, the group would collect mosses, liverworts and lichens. Plans also called for field work on the Louisiade archipelago and Woodlark Island, and for limited study and collection of reptiles, amphibians, fresh-water fishes, insects and birds.

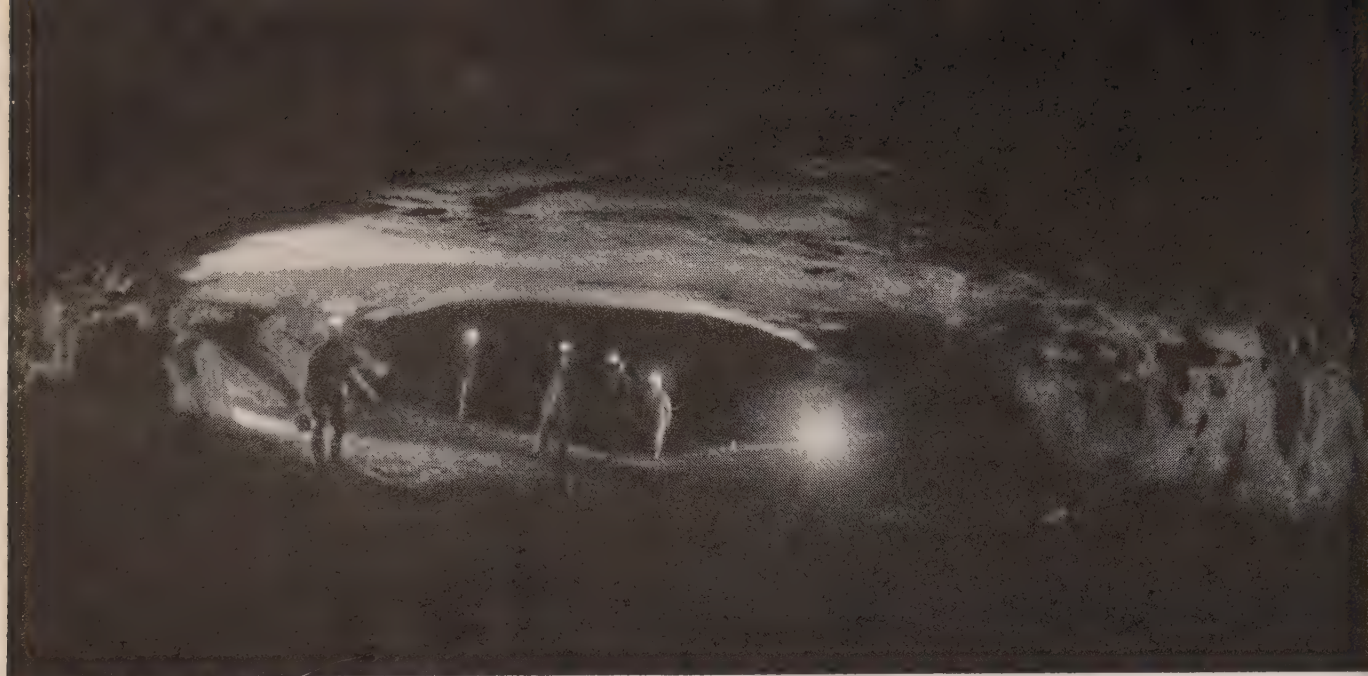
The first members of a team of research workers and their assistants left New York to continue work on a geologic and ecologic survey in the West Indies that it was believed might throw new light on the relationships between present-day communities of living organisms and those that existed thousands of years ago. The expedition, led by Norman D. Newell, curator of historical geology at the American Museum of Natural History, would make use of such techniques of investigation as skin diving and underwater and aerial photography in an attempt to bring back evidence of the history of life to be found in the waters of the Great Bahama bank.

The Peabody museum of Salem, Mass., sponsored an expedition to the South Seas by the yacht "Varua," captained by William Robinson and including a photographer, Eliot Elisofohn, and an entomologist, David Bonnet. During a lengthy cruise among the Pacific islands, the expedition attempted to trace the origins of the Polynesian people. A new approach was used in an endeavour to determine the possible origin of the Polynesians. Recent findings of entomologists and research workers indicated that a particular type of filaria, apparently confined to people of the Polynesian race, is distributed throughout the archipelago and also extends across the Pacific to the mainland of Southeast Asia.

An expedition to northwest Spitsbergen was carried out by Nottingham (Eng.) university, which conducted studies in glaciology and geology and made a survey of the Loven islands. An Oxford university expedition returned from Northeast Land, where extensive ice thickness measurements were made. Cambridge university sent an expedition to east Greenland, which made a systematic collection of rocks in the area and did general ethnological, botanical and zoological collecting. The ring-footed and barnacle geese were banded in a study of bird migration patterns.

Exploration by members of the National Speleological society's Flint Ridge project disclosed that Floyd Collins Crystal cave in Kentucky is actually the nucleus of a cave system larger than any other now known. This exploration uncovered many miles of cave passages, including connections between Crystal cave and other nearby caves, showing that integration exists in the Flint Ridge cave system. Passages already surveyed or explored in the system totalled 32 mi.

The city of Tikal, Guatemala, largest and possibly oldest site of Mayan civilization, was being explored and partially restored by the University of Pennsylvania, Philadelphia. Tikal, deep in the rain forests of the Petén region and virtually deserted for nearly a millennium, is a foliage-covered metropolis of skyscraper temples, lavish palaces, dwellings, paved expressways and long-



"COLUMBIAN AVENUE," a passage in the Flint Ridge (Ky.) cave system which led to the discovery in 1956 of hitherto unexplored areas of the Floyd Collins Crystal cave and established it as the largest cave system in the western hemisphere

dry reservoirs. Occupied for 2,000 to 3,000 years up to about the 10th century A.D., Tikal was rediscovered about a century ago, but was accessible only by muleback until the Guatemalan air force built a landing strip nearby.

Oceanographic research continued during 1956. The "Vema," research ship of the Lamont Geophysical laboratory, made several research voyages, studying the ocean and the ocean floor. During January seismic refraction studies were made in the western Caribbean, the Cayman trench and the Puerto Rican trench. During the summer the ship was taken to the Mediterranean for a study of the Nile delta. It was planned to study the rate of exchange between the Atlantic and the Mediterranean waters, and to seek any evidences of the turbidity current which might have been produced by the Orléansville earthquake which took place in Sept. 1954.

The French oceanographic vessel, the "Calypso," in an expedition in which the National Geographic society co-operated, began a study of the 18,500-ft. deep off the coast of Liberia in the equatorial Atlantic. If successful, the next study would be made in the Romanche trench, the 25,000-ft. deep which is one of the deepest in the Atlantic. Harold Edgerton of the Massachusetts Institute of Technology, Cambridge, was to accompany the expedition, to test his new high-intensity underwater light. The camera and light were to be lowered on a nylon line, which is practically weightless when submerged, since it has almost the same density as sea water.

In Africa, Oxford university had an expedition operating in the High Atlas, making comparative studies of the dry southern slopes and the moister northern slopes.

Cambridge university had an expedition in the Tibesti mountains, part of a study of this area which included a general survey from the coast of Libya as far as Gatrún.

A United States-Australian scientific cruise was made on a British submarine in an endeavour to determine the exact shape of the earth. Sponsored by the office of naval research, the 7,500-mi. cruise was made by H.M.S. "Telemachus" between June 1 and Aug. 1. The "Telemachus" crossed the Tasman sea from Sydney, Austr., to New Zealand, then zigzagged across the Tonga-Kermadec trench between the Tasman sea and the open Pacific ocean. Observations were made from the submerged submarine at depths ranging from 50 to 200 ft., where disturbances from surface waves are sufficiently reduced to allow precise measure-

ments. The Tonga-Kermadec trench, which is about 1,200 nautical miles long, extends from Samoa to New Zealand. Along the sides of the trench the ocean depth is about 15,000 to 20,000 ft. and the trench itself is about 10,000 ft. deep, making the distance from the surface of the ocean to the bottom of the trench a total of about 25,000 to 30,000 ft., one of the deepest ocean floors in the world. During the trip about 130 gravity measurements were made by Hugh H. Traphagen of the Lamont Geological observatory and Stewart Gunson of the Australian bureau of mineral resources. The Tonga-Kermadec trench is of particular interest to geologists and geophysicists, since it is believed to be an initial stage in the development of a new mountain range.

(See also ANTARCTICA; ANTHROPOLOGY; ARCHAEOLOGY; CARTOGRAPHY; COAST AND GEODETIC SURVEY, U.S.; INTERNATIONAL GEOPHYSICAL YEAR, 1957-58; NATIONAL GEOGRAPHIC SOCIETY; OCEANOGRAPHY.)

(S. A. K.)

Explosions: see DISASTERS.

Export-Import Bank of Washington. Established in 1934 as a District of Columbia banking corporation, the Export-Import bank was reincorporated as an independent agency of the United States government by the Export-Import Bank act of 1945 and operates under that act as amended. The basic purpose of the bank is to aid in financing and to facilitate the overseas trade of the United States. During 22 years in pursuit of this objective the bank had authorized loans or guaranties in 67 countries in a total amount of \$7,400,000,000. A total of \$5,171,000,000 had been disbursed of which \$2,648,000,000 was outstanding at the close of the 1956 fiscal year.

During fiscal 1956, 156 credits totalling \$375,900,000 were authorized. There were 492 credits in 57 countries in the bank's portfolio on June 30, 1956.

The bank authorized credits for development projects requiring United States goods and engineering services as well as to enable United States suppliers to consummate individual sales of equipment abroad. The bank also established 51 exporter credit lines on behalf of United States exporters amounting to \$32,800,000. Although the greatest dollar volume of loans was applied for by overseas borrowers for the purchase of United States equipment for development projects, the greatest number of applications for credit was received from United States exporters desiring assistance in consummating sales to their customers overseas.

In financing exports upon application of the United States exporter, whether on a case-by-case basis or under a line of credit, the bank generally required the exporter to participate to the extent of 20% of the sales price and required the buyer to make an advance payment of varying percentages but usually amounting to at least 20%. The bank then agreed either to guarantee or to purchase the remaining 60% without recourse to the exporter.

The capital stock of the bank amounting to \$1,000,000,000 is held by the United States treasury. The bank is authorized to borrow from the treasury up to four times the amount of this capital stock, thus placing a ceiling of \$5,000,000,000 on the loans and guaranties which it may have outstanding at any one time. On June 30, 1956, the bank had in its portfolio loan authorizations and guaranties totalling approximately \$3,300,000,000, leaving an uncommitted lending authority of approximately \$1,600,000,000.

During fiscal 1956 the bank's net income was \$60,200,000 out of which the bank paid a dividend of \$22,500,000 to the treasury, adding the balance of net earnings of about \$37,000,000 to its reserve for contingencies, which at the close of fiscal 1956 amounted to \$404,700,000. (S. Sd.)

Exports: see AGRICULTURE; INTERNATIONAL TRADE. See also under various countries.

Eye, Diseases of the. The man-made fireball of atomic and hydrogen detonations is more brilliant than the sun or any other natural light source visible on earth. Depending on the intensity, light sources of such extreme brightness may have both temporary glare and burning effects. The glare effects from nuclear explosions are similar to those experienced when looking directly at the sun. The permanent lesions from the fireballs have a parallel in the chorioretinal burns described as eclipse blindness.

On a theoretical basis it was predicted that damage to the unprotected retina would occur at distances greater than any known biological effect from the fireball of atomic detonations. To test this prediction, extensive experiments with rabbits were performed. They demonstrated that chorioretinal burns may occur from exposure to atomic bombs at distances up to 42.5 miles.

The chorioretinal damage occurred at much greater distances from atomic flashes than skin burns were known to occur. This was because of the focusing effect of the optical system of the eye and the pigment distribution in the tissues. The extent of chorioretinal injury depends on the heat generated in the pigmentary layers. Since these layers are thin, the energy is absorbed in a small volume. Consequently, high temperatures are reached rapidly. Close to the detonation this temperature should theoretically be higher than the boiling point of water, causing a water vapour explosion. Histologic examination of experimental animals suggested that such explosions occurred. Eclipse blindness occurs only if the sun is fixed voluntarily and the blink reflex is suppressed.

However, the human blink reflex, occurring at an average within 0.1 sec., is not fast enough to prevent damage from atomic detonations. The latter has a peak emission before 0.01 sec. During this early phase, the fireball of a nominal weapon reaches brightness up to 100 times that of the sun.

Relatively small amounts of visible radiation in excess of that to which humans are adapted cause glare. This is a temporary effect. Greater amounts of visible radiation cause after-images, which may last for seconds, minutes or hours. Excessive degrees of visible and infra-red irradiation cause permanent chorioretinal burns, with resultant scotomata and possibly retinal detachment. Surgical treatment has proven to be of great value in saving the

sight of eyes in which detachment of the retina in some degree has occurred. The earliest operations consisted of multiple points of fulguration of the detached portion of the retina by electric current through small pins inserted into the eye through the sclera. In selected cases the results are satisfactory. The retina is restored to its proper anatomical position and sight is saved. However, many detachment cases are in myopic eyes where the eyeball becomes enlarged through expansion of the sclera. The choroid and retina do not expand equal to the sclera, with the result that the retina becomes separated from the choroid and is sometimes lacerated in the process. The fulguration operation in such cases is not successful in restoring the retina, so it was abandoned for "scleral shortening" operations; i.e. reduction in size of the eyeball.

Two procedures proved quite successful; (1) scleral resection operation, which causes a decrease in the surface of the sclero-choroidal wall which has to be covered by a reattached retina, axial shortening of the eye, and decrease in the inner volume of the eye; (2) scleral buckling operation, which causes no decrease of the inner surface of the choroid which has to be covered by a reattached retina, axial shortening of the eye identical to that in scleral resection, decrease in the inner volume of the eye considerably higher than that caused by the scleral resection, and permanent or at least a long-lasting cylindrical protusion of the sclero-choroidal wall into the eye.

These operations may in some cases be followed by fulguration to produce permanent adhesions of the retina and choroid to the sclera but in some cases this is not necessary. With slight variations in technique these surgical procedures may be the means of saving sight for thousands of persons otherwise doomed to a life of darkness.

Isoniazid, a chemotherapeutic agent, which proved valuable in treatment of pulmonary tuberculosis, was found to be effective against tubercle bacilli introduced into the eyes of rabbits, but not against other bacteria. Half or more of the patients having choroiditis, periphlebitis and anterior scleritis with uveitis improved while under treatment with isoniazid, although the tubercle bacillus was not proved to be the cause of the disease.

Because of the public nuisance aspect, the stinging and burning sensation of the eyes which is associated with the smog of some large cities (particularly Los Angeles, Calif.) stimulated considerable research by industrial and public health agencies, yet the substances responsible for the eye irritation were not identified.

The opinion was that either hydrocarbon (petroleum) or ozone might be responsible.

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Facsimile: see TELEGRAPHY.

Faeroe Islands (FAERÖERNE). This self-governing part of the kingdom of Denmark in the north Atlantic situated between Iceland and the Shetland Islands is about 200 mi. northwest of the latter. Area: 540 sq.mi.; there are 21 islands of which 18 are inhabited. Pop. (1950 census) 31,781; (1955 est.) 34,000. Language: Faeroese, akin to Icelandic rather than to Danish. Religion: Lutheran. Capital, Thorshavn, on the island of Stromo, pop. (1950) 5,607. Governor general in 1956, C. A. Vagn-Hansen.

History.—During the first months of 1956, in opposition to the Landsstyre (government), which in its endeavour to control the rioting at Klaksvig in 1955 had requested assistance from the Danish police, the Tjodveldisflokkurin (Republican [Left-

wing] Independence party) gathered signatures on a motion demanding a general election. However, the motion got support only from about 25% of the electorate and did not cause dissolution of the Lagting (local parliament). As a result the political crisis arising from the Klaksvig episodes was overcome and a commission was appointed to make proposals for a reorganization of the Faeroese police. Later in 1956 H. C. Hansen, the Danish premier, visited the Faeroe Islands in order to hear the Faeroese proposals for the improvement of Danish-Faeroese relations. (H. LN.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*A Faroe Islands Family* (1953).

Fairs and Exhibitions. **United States and Canada.**—United States continued to expand during 1956 at an amazing rate. The reason appeared to be that they feature the products of the land and products for the home, as well as the types of entertainment which appeal to the masses. Steadily increasing attendance kept about 3,000 fairs in operation and stimulated huge new building additions to the larger fairs. The Canadian National exhibition in Toronto, Ont., started work in 1956 on a new \$3,000,000 convention hall and women's building. The Arizona State fair at Phoenix was building a \$1,000,000 Coliseum to be ready in 1957. The Kentucky State fair, Louisville, was building a new \$15,000,000 plant, and the Calgary (Alta.) exhibition and stampede started an \$800,000 expansion campaign.

Among the larger fairs and exhibitions there was keen rivalry for leadership. New buildings, new entertainment features and larger premiums for exhibits were offered, which resulted during 1956 in a general upsurge in attendance, in many instances surpassing any previous years.

No fair on the continent seemed able to approach the Canadian National exhibition in attendance. The 1956 figure for the 14-day event was 2,832,000, a new high and far ahead of any fair in the United States. The State Fair of Texas, Dallas, annually records slightly more than 2,000,000 attendance, and the Los Angeles County fair, Pomona, Calif., draws more than 1,000,000.

The number of fairs precludes the possibility of listing more than a few, but besides the aforementioned, the following list gives, in round figures, the attendance at some of the larger agricultural and horticultural fairs and exhibitions.

United States

Feb. 16-22	Riverside County fair, Indio, Calif.	136,000
Aug. 4-12	Orange County fair, Middletown, N.Y.	114,000
Aug. 6-12	North Iowa fair, Mason City, Ia.	112,000
Aug. 17-26	San Joaquin County fair, Stockton, Calif.	180,000

FLOOR SHOW of contemporary abstract sculpture, part of an international exhibition of modern art at Venice, It., in 1956. Artists of 34 nations participated

Aug. 18-24	Darke County fair, Greenville, O.	248,000
Aug. 18-26	Wisconsin State fair, Milwaukee	779,000
Aug. 18-26	Missouri State fair, Sedalia	537,000
Aug. 21-26	Colorado State fair, Pueblo	823,000
Aug. 24-31	Ohio State fair, Columbus	660,000
Aug. 25-Sept. 3	Minnesota State fair, St. Paul	1,036,000
Aug. 29-Sept. 7	Indiana State fair, Indianapolis	855,000
Aug. 29-Sept. 9	California State fair, Sacramento	823,000
Aug. 30-Sept. 3	Central Wisconsin State fair, Marshfield	117,000
Aug. 31-Sept. 9	Michigan State fair, Detroit	821,000
Sept. 1-8	New York State fair, Syracuse	400,000
Sept. 3-8	South Dakota State fair, Huron	115,000
Sept. 9-15	Saginaw fair, Saginaw, Mich.	335,000
Sept. 9-15	Brockton fair, Brockton, Mass.	195,000
Sept. 10-15	Clay County fair, Spencer, Ia.	165,000
Sept. 11-15	Eastern Idaho State fair, Blackfoot	110,000
Sept. 18-23	Eastern States exposition, Springfield, Mass.	455,000
Sept. 14-23	Utah State fair, Salt Lake City	248,000
Sept. 14-23	Western Washington fair, Puyallup	361,000
Sept. 17-22	Tennessee State fair, Nashville	257,000
Sept. 21-29	Mid-South fair, Memphis, Tenn. (centennial)	465,000
Sept. 22-29	Oklahoma State fair, Oklahoma City	416,000

Canada

July 16-21	Edmonton exhibition, Edmonton, Alta.	270,000
July 9-14	Calgary exhibition and stampede, Calgary	521,000
July 30-Aug. 4	Provincial exhibition, Regina, Sask.	228,000
Aug. 18-25	Ottawa exhibition, Ottawa	423,000
Aug. 22-Sept. 3	Pacific National exhibition, Vancouver, B.C.	737,000
Aug. 31-Sept. 9	Provincial exhibition, Quebec, Que.	390,000
	Fredericton exhibition, Fredericton, N.B.	60,000

Scores of other fairs had attendance running from 100,000 to more than 250,000.

Industry and Miscellaneous.—The list of trade shows and other important exhibitions other than fairs held annually runs to considerably more than 2,000. Trade shows are a \$3,000,000,000 industry and are steadily growing. In every large city there are auditoriums and arenas seating from 5,000 to 20,000 persons and with exhibit space for huge displays. These and the large exhibition halls on most state fair grounds house the auto shows, home shows and shows of many other industries. New building costing from \$10,000,000 to \$30,000,000 and more each were being planned or built. New York and Chicago are the trade show centres in the United States. Among the important 1956 shows in New York were the International Auto show, National Photography show, International Philatelic show, National Home Furnishings show and International Antiques exhibition; in Chicago, the home show, auto show, sports show and National Premium Buyers show. Home shows, under the general title of National Home show, are held annually in nearly 50 cities. Auto shows and sports shows are held in every city of 100,000 or more. The paper trade, the electrical industry, the manufacturers of jewelry, gifts, electronic products and tobacco, and in fact every leading industry, hold annual shows throughout the country. (NA. G.)

Great Britain and Other Countries.—During 1956 the following fairs and exhibitions attracted much attention:





EXHIBITION AND CONVENTION BUILDING, the Coliseum, opened in New York city April 28, 1956. Exhibition space is contained in the six-story section on the right; twenty floors of office space are housed by the building on the left

Agriculture and Horticulture

May 22-25 Royal Horticultural society's show, Chelsea, Eng.
 May 30-June 2 Bath and West and Southern counties show, Cardiff, was the society's 12th visit to Wales. At the last Cardiff show, in 1948, there were 162,943 visitors; in 1956 there were only 109,519, which showed a loss.
 June 12-14 Three Counties show, Hereford, Eng., was the last of the shows to be held in turn in the counties of Hereford, Worcester and Gloucester. The society acquired a permanent show ground at Malvern, Eng.
 June 19-22 Royal Highland show, Inverness, Scot.
 June 20-23 Royal Counties show, Poole, Dorset. Total attendance, 69,285.
 July 3-6 Royal Agricultural show, Newcastle upon Tyne, was marred by bad weather but the number of visitors (242,548) was a record. Livestock entries totalled 3,536. This was the seventh royal show to be held at Newcastle upon Tyne since 1846.

Industry

Dec. 29-Jan. 10 National Boat show, Olympia, London, sponsored by the *Daily Express*, attracted 144,705 visitors, nearly 24,000 more than in 1955.
 Feb. 22-March 2, British Industries fair: the exhibition was held in two parts, first at Earl's Court, London, when it was combined with the British Toy fair, and later at Olympia, London, and Castle Bromwich, Birmingham. Before the second part of the fair was opened the government decided, because of declining trade interest, not to renew its grant to British Industries Fair Ltd. Therefore, as from 1957, only the Birmingham section (devoted to heavy engineering and organized by the Birmingham chamber of commerce) would be held.
 March 6-31 *Daily Mail* Ideal Home exhibition, Olympia, London, for many years the largest and most popular of exhibitions, again had an attendance of more than 1,000,000.
 Aug. 28-Sept. 15 The fourth British Food fair, Olympia, London, was open for a week longer than the previous fair in 1954. The United States, for the first time, was one of 14 overseas countries taking part.
 Sept. 4-9 Seventeenth flying display and static exhibition of Society of British Aircraft Constructors, Farnborough. Bad weather caused many changes to be made to the planned flying program. There were more overseas visitors than ever before, and 338 exhibitors were a record.
 Oct. 17-27 Motor show, Earl's Court, London, attracted 494,912 visitors, 22,000 fewer than in 1955. The number of overseas visitors (16,787) was a record.
 Nov. 12-17 Cycle and Motor Cycle show, Earl's Court, London. The show opened two days late because of a strike of exhibition workers.

Overseas

The British government announced a change of policy with regard to participation in some overseas trade fairs. Following the ending of the British Industries fair in London it was decided to sponsor British pavilions at some fairs overseas. One of these was the Damascus fair (Sept. 1-30), the only annual trade fair in the middle east.
 March 13-22 Utrecht spring fair in the Netherlands attracted 1,416 exhibitors, including 351 from Great Britain and 138 from the United States.
 April 14-24 Swiss Industries fair, Basle, Switz., had about 2,300 exhibitors.
 May 5-21 Foire de Paris was held for the first time in a new exhibition hall. The largest foreign participation was from

Italy and Switzerland. A fire on May 20 caused considerable damage.

June 4

The U.S.S.R. permanent agricultural exhibition reopened for the 1956 season.

June 17-30

The twenty-fifth Poznan fair, Pol., was interrupted by riots which started shortly after the fair was opened. About 400,000 people visited the exhibition, including 3,000 from overseas.

Sept. 1-3

International Police exhibition, Essen, Ger. A British exhibit had as its theme "the generally friendly and happy co-operation between the police and the public."

(See also SHOWS.)

(A. J. KD.)

Falk Foundation, Maurice and Laura: see SOCIETIES AND ASSOCIATIONS, U.S.

Falkland Islands. The Falkland Islands include a British colony (East and West Falkland and adjacent islands) and dependencies in the South Atlantic. Dependencies: (1) South Georgia (1,450 sq.mi.; pop., 1953 census, 1,358; whaling industry centre), with South Orkney (240 sq.mi.) and South Sandwich (130 sq.mi.); and (2) South Shetland (1,800 sq.mi.) and Graham Land (on antarctic mainland). Dependencies, total pop. (1953 census) 1,400. Area of colony: 4,618 sq.mi. Pop.: (1953 census) 2,230, (1955 est.) 2,000, mainly of British descent and Protestant. Only town, Stanley (cap.), pop. (1953 census) 1,135. Governor in 1956, O. R. Arthur.

History.—In Stanley in 1956 a new infants' school, a new power station and new harbour jetties were completed as part of the colony's development scheme. The town water supply was improved, and progress was made on plans for a new senior school. Work was begun on a system of roads designed to connect Stanley with the farms and settlements of East Falkland, and plans were made for a similar road system in West Falkland. A new boarding school was opened at Davison settlement, West Falkland, and a similar school for the outlying farming communities of East Falkland was proposed.

In the dependencies two new survey bases were opened on the Danco and Loubet coasts, Western Graham Land. The main base of the commonwealth transantarctic expedition was established on the Filchner ice shelf, and the British International Geophysical year base was established in Coats Land. Meteorological reports from the new bases were included in the regular summaries, and forecasts were broadcast from Stanley for the benefit of South Atlantic shipping.

(B. SE.)

Education.—(1955) Five schools, pupils 350; also 19 itinerant teachers. Darwin boarding school opened 1956.

Finance and Trade.—Currency: sterling with local notes. Budgets: (1954-55, approved est.) revenue £285,142, expenditure £284,648; (1955 est.) revenue £299,000, expenditure £403,000. Foreign trade (including dependencies, 1955): imports £2,970,000; exports £3,840,000. Principal exports (1955): wool (4,395,322 lb.), hides and skins, guano, whale oil (185,739 bbl.), whale meat meal. Principal imports (1955): hardware, provisions, timber, coal, tobacco.

Famines: see AGRICULTURE.

Farm Co-operatives: see CO-OPERATIVES; FARM CREDIT SYSTEM.

Farm Credit System. Farmers and their co-operatives in the year ended June 30, 1956, borrowed \$2,700,000,000 from the organizations of the co-operative Farm Credit system supervised by the Farm Credit administration. This was \$273,000,000 or 11% more than in the previous year.

The system operates through 12 Farm Credit districts and includes 1,100 national farm loan associations, 498 production credit associations, 12 federal land banks, 12 federal intermediate credit banks, 12 production credit corporations (which were to be merged into the 12 intermediate credit banks on Jan. 1, 1957) and 13 banks for co-operatives including a Central Bank for Cooperatives located in Washington, D. C.

Farmers' and their co-operatives' investment in the capital stock of the system reached a new all-time high of \$217,000,000

on June 30, 1956. This compared with \$198,000,000 a year previous. All the national farm loan associations and the 12 federal land banks are entirely farmer-owned, as well as 441 of the 498 production credit associations. Farmers' marketing, purchasing and service co-operatives owned 12.3% of the capital of the 13 banks for co-operatives on June 30, 1956, and the remainder was owned by the U.S. government.

The 12 federal intermediate credit banks and the 12 production credit corporations are entirely government owned but legislation enacted in 1956 provided a basis for gradually shifting ownership to the production credit associations. During the year, the amount of government capital in the system declined from \$243,885,000 to \$239,305,600.

Farm Mortgage Loans.—Farmers obtained 60,600 farm mortgage land bank loans for \$513,000,000 through their 1,100 farm loan associations in the year ended June 30, 1956. This was 3,600 more loans and \$111,000,000 more credit than in the preceding year. At June 30, farmers were using 357,000 land bank loans for \$1,600,000,000, the largest amount since 1942. They had obtained these loans in 1956 and prior years.

To obtain funds to make loans, the land banks in the year sold \$490,000,000 of consolidated federal farm loan bonds to investors. On June 30, 1956, the banks had outstanding \$1,385,000,000 in bonds. These bonds are not guaranteed by the U.S. government in any way. A part of the loan volume is financed with the banks' own funds and with borrowings from commercial banks which totalled \$32,700,000 on June 30, 1956.

In the year, farmers repaid \$194,000,000 on their land bank loans. Of this amount \$116,000,000 was matured principal and interest and \$78,000,000 was payments ahead of schedule.

The Farm Credit act of 1955 broadened the services of the land bank system. One of the provisions made the system better able to serve part-time farmers. This resulted in 3,755 part-time farmers obtaining \$17,000,000 in loans through local national farm loan associations during the year.

In the year, farmers received \$4,400,000 in dividends on the capital stock they owned in their national farm loan associations, thus cutting the cost of their credit.

Production Credit.—Farmers obtained 270,100 operating loans for \$1,400,000,000 from their 498 production credit associations in the year ended June 30, 1956. While the number of loans remained about the same as the previous year the amount was up about 7%. At June 30, farmers had 251,200 loans outstanding for \$863,000,000. Funds to make loans are obtained primarily by discounting farmers' notes with the federal intermediate credit banks.

The 481,000 members of production credit associations on June 30, 1956, owned capital stock in their associations amounting to \$100,172,647. This was \$4,038,695 more than a year previous. During the year, 22 more associations became completely member-owned, bringing the number so owned to 441 or 89% of the total. The capital stock of the production credit associations owned by the government, through the 12 production credit corporations, was reduced to \$2,020,000. This compared with \$90,000,000 that the government had invested in these associations in the mid-1930s.

Farmer-owned stock, plus accumulated earnings of \$100,867,033, represented about 99% of the total net worth of the associations on June 30.

Farmer-members of 202 associations received \$1,000,000 in dividends in the year, which compared with \$792,000 paid by 121 associations in the preceding year. Farmer-members of 47 dividend-paying associations also received patronage refunds amounting to \$537,000, which compared with \$418,000 paid by 30 associations in the 1955 fiscal year. The 441 completely farmer-owned production credit associations paid \$2,479,765 in

state and federal income taxes during the fiscal year.

Credit for Co-operatives.—Farmers' marketing, purchasing and business service co-operatives borrowed \$567,000,000 from the 13 banks for co-operatives in the year ended June 30, 1956. Of the total credit, 66% was for operating capital, 26% was commodity loans and 8% was for facilities.

The 2,277 farmers' co-operatives using the banks on June 30 was the largest number at any year-end. These co-operatives had loans amounting to \$349,000,000, which was 10% more than on the same date the previous year.

Part of the funds to finance the banks' loans was obtained through the sale of consolidated debentures totalling \$141,650,000. Debentures are not guaranteed in any way by the U.S. government. Debentures outstanding at June 30, 1956, totalled \$132,800,000. Commercial bank borrowings totalled \$272,000,000 during the year.

Farmer co-operatives owned capital stock in the 13 banks amounting to \$20,700,000 on June 30, 1956, compared with \$18,300,000 a year earlier. For the six months the banks operated under the new Farm Credit act of 1955, which makes it possible for farmers' co-operatives to eventually completely own the banks, co-operatives received \$225,000 in dividends on their class-B (investment) stock. They also received patronage refunds of \$1,600,000 in the form of class-C stock. As a result of co-operatives increasing their stock ownership in the banks the 13 banks were able to repay \$2,600,000 of government-owned capital. For the year ended June 30, 1956, the 13 banks paid \$1,298,687 in federal franchise taxes.

Federal Intermediate Credit Banks.—The 12 federal intermediate credit banks, which provide funds for lending institutions making loans to farmers, made loans and discounts of \$2,000,000,000 in the year. Of this amount, 91% was for production credit associations, 8% for privately capitalized institutions and 1% for banks for co-operatives and co-operative associations. Funds to make loans and discounts were obtained by selling \$1,050,150,000 in consolidated debentures in the investment market. Debentures outstanding on June 30, 1956, totalled \$834,500,000. These debentures are not guaranteed by the U.S. government in any way. The intermediate credit banks paid \$91,792 in franchise taxes to the government for the fiscal year 1956.

(R. B. T.)

Farmers Home Administration. Farmers in every agricultural county in the United States used the credit services of the Farmers Home administration, an agency in the U.S. department of agriculture, during the fiscal year ended June 30, 1956. About 132,000 farm families obtained loans totalling \$308,000,000, the most the agency ever loaned in a single year.

The loans were accompanied by appropriate technical assistance and were made for operating, purchasing, enlarging, developing and improving farms, and for meeting emergency credit needs of farmers who, because of drought, storms or similar disasters, needed a supplemental source of credit to continue normal operations.

Only farmers unable to get suitable credit from private or co-operative sources were eligible for the aid. The agency's approvals of loan applications were based on the policy of supplementing rather than competing with private credit.

A large proportion of the loans were made to young farmers, including veterans, who had need for adequate credit and some technical help in developing sound farming systems and adopting efficient farm management practices. Veterans received preference for most types of loans.

A total of 78,280 family-type farmers borrowed production loans amounting to \$147,052,000 to purchase livestock, feed, seed, fertilizer, insecticides and equipment, and to pay other

farm and home operating needs.

Progress made by families who paid production loans in full in 1955 and continued to farm in 1956 was analyzed in the 1956 fiscal year. The average farmer in this group used the agency's credit four years, during which time his net worth increased from \$6,145 to \$9,075 and the value of his livestock and equipment rose from \$2,760 to \$4,800.

Loans to buy, enlarge or develop farms, called farm-ownership loans, totalled \$58,765,000, and were made to 5,100 farmers. The Farmers Home administration continued its policy of making most of these loans from funds advanced by private lenders on an insured basis. Of the total loaned, \$39,765,000 was from insured loan funds and \$19,000,000 was from funds annually appropriated by congress for direct loans.

The agency continued its policy of making most of its soil and water conservation loans from insured funds advanced by private lenders. This program helped 2,320 farmers and farmers' associations carry out measures for soil conservation, water development and use, permanent pasture development and farm drainage. Total loans amounted to \$11,910,000, of which \$10,589,000 was advanced by private lenders on the insured loan basis.

Farm housing loans, authorized during about the last six weeks of fiscal 1956, enabled farm owners to obtain decent, safe and sanitary farm dwellings and other essential farm buildings. A total of \$3,721,000 was loaned for this purpose.

In designated areas where emergencies caused need for supplemental agricultural credit not available from other sources, 45,840 farmers and ranchers received \$87,044,000 in emergency loans.

The loans aided farmers in continuing their normal operations after suffering losses from drought, storms or other disasters, or those who, because of local economic conditions, were unable to obtain credit from other sources. Of the total loaned, \$13,530,000 was for special livestock loans which helped established producers and feeders (except commercial feed lot operators) maintain normal livestock operations.

During the fiscal year ended June 30, 1956, total principal and interest payments by borrowers on all types of loans amounted to \$282,333,000, compared with \$275,927,000 during fiscal 1955.

(K. H. H.)

Farm Income: see AGRICULTURE.

Farm Machinery: see AGRICULTURE.

Farm Population: see CENSUS DATA, U.S.

Fashion and Dress: see SHOE INDUSTRY; WOMEN'S FASHIONS.

Fats and Oils: see VEGETABLE OILS AND ANIMAL FATS.

FBI: see FEDERAL BUREAU OF INVESTIGATION.

Federal Bureau of Investigation. The Federal Bureau of Investigation, established in 1908 by Attorney General Charles J. Bonaparte, is charged with the investigation of violations of certain specific federal laws and the collection of evidence in such cases. As the fact gathering and fact reporting arm of the United States department of justice, the FBI has jurisdiction over more than 140 federal investigative matters, encompassing both general investigations and domestic intelligence operations. It also assists local, county and state law enforcement agencies and other agencies of the federal government. FBI headquarters is located in Washington, D.C., and 52 field offices are maintained in major cities throughout the United States and in Alaska, Puerto Rico and Hawaii.

The primary responsibility for combating foreign intelligence agents and other internal enemies of the United States rests

with the FBI. Objectives of FBI investigations of foreign intelligence operations are: (1) to identify subversive elements within the United States and secure intelligence information concerning their activities and future objectives; (2) to obtain legal evidence of violations of federal laws; and (3) to disseminate security information vital to other federal agencies. Since the FBI's security operations are primarily preventive, it is not possible to measure their effectiveness by arrests and convictions alone. The 76,704 security-type matters received for investigation during the fiscal year ended June 30, 1956, suggests the magnitude of these operations.

Investigation of Subversive Organizations.—During the 1956 fiscal year, a number of organizations cited as subversive by the attorney general under executive order 10450 were under investigation by the FBI. In addition, facts concerning other groups were reported to the department of justice so that determination could be made as to their character. The facts gathered by the FBI concerning subversive organizations are promptly disseminated to interested agencies of the federal government. The FBI does not decide whether an organization is subversive or not and makes no recommendation to those responsible for such decisions. The FBI's investigations involving the Communist party in the United States, during the fiscal year resulted in the arrest of eleven Communist party leaders who were charged with violating the Smith act. As of July 1, 1956, 145 Communist party leaders had been indicted on Smith act charges, 102 had been convicted in federal court and others were awaiting trial.

General Investigation.—Convictions in cases investigated by the FBI during the 1956 fiscal year totalled 10,957 as compared with 10,615 during the 1955 fiscal year. These convictions represented 96.4% of the persons brought to trial in FBI cases. Sentences imposed totalled 29,992 years, 6 months and 14 days. Fines, savings and recoveries in cases investigated by the FBI during the 1956 fiscal year exceeded \$123,000,000, an all-time high and more than double the 1955 figure.

Investigations by the FBI in cases involving interstate crimes reflected a general increase for the 1956 fiscal year. Convictions for theft from interstate shipment rose from 772 during 1955 to 790 in 1956; interstate transportation of stolen property convictions totalled 856 while interstate transportation of stolen motor vehicle convictions totalled 4,736. The latter two figures, as well as the 14,636 automobiles recovered in FBI cases, represented all-time peaks. The 558 convictions in fraud matters, which included fraud matters involving federal lending and insurance agencies and the Federal Housing administration, exceeded the total in this category for any prior year.

Co-operation with Other Agencies.—Co-operation with local, state and federal law enforcement agencies is an integral part of the FBI's operations. Upon request, the services of the FBI laboratory and the FBI identification division are available without cost to law enforcement agencies and other federal government agencies. During the 1956 fiscal year, the FBI laboratory received 124,066 specimens of evidence for examination. These specimens were submitted in connection with 31,316 individual requests and involved 142,627 examinations. In the previous fiscal year, the FBI laboratory conducted 133,724 examinations involving 118,398 specimens of evidence submitted in connection with 27,664 individual requests.

The identification division during fiscal year 1956 received 5,284,357 fingerprint cards from 12,902 contributors, an average of more than 20,000 fingerprints each working day. Fugitives identified through fingerprint comparisons totalled 13,833, an all-time high. As of June 30, 1956, the identification division had more than 140,000,000 fingerprints in its files, representing approximately 72,000,000 persons.

The FBI, upon request, assists local law enforcement agencies

in special training programs held at the FBI National academy in Washington, D.C., and in police training schools conducted throughout the nation. With the completion of its 57th session in June 1956, the FBI National academy had graduated 3,163 men representing police agencies in every state in the United States, and in Alaska, Hawaii, Puerto Rico, the Canal Zone and several foreign nations. In addition, during the 1956 fiscal year, the FBI participated in 3,492 police training schools held on a local basis.

Use of Confidential Informants.—The value of confidential informants to effective police work was emphasized during the 1956 fiscal year when information furnished by them resulted in the arrest of more than 1,200 persons in FBI cases. In those cases where information furnished by informants concerned matters within the investigative jurisdiction of other law enforcement agencies, the information was confidentially disseminated to them. As a result, more than 750 persons were arrested by those agencies.

Publications.—As additional aids to law enforcement, the FBI publishes the *FBI Law Enforcement Bulletin* and the *Uniform Crime Reports*. The *FBI Law Enforcement Bulletin*, published monthly, serves as a medium for the exchange of ideas among law enforcement agencies. The *Uniform Crime Reports* bulletin, published annually and semiannually, is a statistical analysis of local crime based on reports submitted by more than 5,800 law enforcement agencies throughout the United States. (See also CRIME; JUVENILE DELINQUENCY; POLICE; SECRET SERVICE, U.S.) (J. E. H.)

Federal Civil Defense Administration: see CIVIL DEFENSE, U.S.

Federal Communications Commission.

Radio and television sets outnumber bathtubs and even running water facilities in U.S. homes, according to figures compiled by the Federal Communications commission in 1956. Of the nation's 164,000,000 sets—representing more than 60% of the world's total—39,000,000 were television sets in 1956 (about 80% of the world total). The commission estimated that by mid-1956 nine out of ten persons in the United States were within reception range of at least one television station.

In mid-1956 there were 4,352 broadcasting stations with 2,700 auxiliaries authorized by the FCC (Table I) and about 342,000 authorized nonbroadcast stations (Table II). The nonbroadcast stations alone were using a total of approximately 1,200,000 fixed and portable transmitters.

The FCC took a major step toward bringing more television service to smaller U.S. communities when it authorized the new "translator" stations beginning July 2, 1956. These low-power, economically operated stations pick up the programs of regular TV stations and rebroadcast them locally. Still another type—the "satellite" station—duplicates the programs of regular stations to set up a local outlet.

Table I.—Radio and TV Stations in the U.S., June 30, 1956

Service	Authorized	On Air
Commercial TV*	609	496
Educational TV†	41	20
Commercial radio (AM)	3,020	2,896
Commercial radio (FM)	546	530
Educational radio (FM)	136	126
Total	4,352	4,068

*Stations equipped for colour telecasting numbered about 300.

†Total number of channels reserved for educational TV stations was 258.

Table II.—Nonbroadcast Radio Station Authorizations in U.S., June 30, 1956

Amateur	150,500	Land transportation	28,000
Marine	57,000	Public safety	21,000
Aviation	49,000	Common carrier	2,300
Industrial	30,600	Other	3,500

Monitoring and National Defense.—Aided by mobile units, the FCC during the fiscal year 1955-56 detected a total of 147 illegal radio transmitters in the United States—42 more than in the previous year. Approximately 20,000 complaints of interference with reception were received by the commission's 24 district offices.

FCC engineers gave assistance to 117 planes and ships in distress during the fiscal year.

The commission continued its supervision of conelrad (control of electromagnetic radiation), a program designed to confuse potential enemy aircraft that might try in wartime to use commercial radio signals to get their navigational bearings. Participating stations in the program switch rapidly to different frequencies so that beams cannot be followed.

The commission's 18 monitoring stations, comprising the only nation-wide listening network, took about 118,000 bearings during the year.

Frequency Allocations.—The FCC was represented at 11 international conferences on frequency allocation during the fiscal year and continued its duties of implementing the decisions of such conferences domestically. The commission's master list included about 157,000 frequency assignment records.

Telephone and Telegraph Rates.—No major telephone rate changes (supervised by the FCC) were authorized during the year. On July 27, 1956, the FCC authorized Western Union, the only domestic telegraph carrier, to increase its rates by a total of approximately \$9,657,000, to offset increased wages paid by the company. The new rates went into effect Aug. 26, 1956.

Personnel.—George C. McConaughy was renamed chairman of the FCC by Pres. Dwight D. Eisenhower on Feb. 26, 1956. Richard A. Mack became a member of the commission on July 7, 1955, and T. A. M. Craven on July 2, 1956.

(See also RADIO AND TELEVISION; TELEGRAPHY; TELEPHONE.)

Federal Deposit Insurance Corporation.

In the fiscal year July 1, 1955, to June 30, 1956, there were two cases in which disbursements by the Federal Deposit Insurance corporation were necessary to protect depositors of insured banks. Disbursements in these two cases totalled \$4,567,372 and there remained unpaid claims of about \$14,000.

From the beginning of deposit insurance until June 30, 1956, the corporation had disbursed \$338,600,000 in the cases of 429 distressed insured banks. This consisted of \$337,000,000 for protection of depositors and \$1,600,000 to facilitate termination of liquidations. The banks involved held approximately 1,400,000 accounts with deposits of about \$572,000,000, of which about 0.3% was lost to depositors. Liquidation of assets by the corporation had resulted in recovery of about nine-tenths of its total disbursements.

On June 30, 1956, the assets of the corporation totalled \$1,822,462,212, of which \$1,816,847,213 consisted of obligations of the United States government. Liabilities totalled \$131,643,818. The excess of assets over liabilities, known as the deposit insurance fund, amounted to \$1,690,818,394. This fund represented accumulated assessments and investment income in excess of losses and expenses in the past.

As of Dec. 31, 1955, the 13,457 insured banks held deposits totalling \$212,225,648,000. Based on studies made in the past, it was estimated that 54.8% of this total, or \$116,380,000,000 was insured. On Dec. 31, 1955, the deposit insurance fund of \$1,639,588,832 was equal to 1.4% of estimated insured deposits.

The board of directors of the Federal Deposit Insurance corporation was composed in 1956 of H. E. Cook, chairman; Ray M. Gidney, comptroller of the currency, vice-chairman; and Maple T. Harl.

(E. H. Cr.)

Federal Housing Administration: see HOUSING.

Federal Income Tax: see TAXATION.

Federal Land Banks: see FARM CREDIT SYSTEM.

Federal Power Commission. **Natural Gas.**—During the year ended June 30, 1956, the Federal Power commission authorized construction in the United States of 4,400 mi. of natural gas pipelines and compressor units aggregating 255,000 h.p., costing \$461,400,000. These facilities were designed to add nearly 2,250,000,000 cu.ft. to the daily delivery capacity of the nation's transmission systems, and to benefit 170 cities of 50,000 population or more in 31 states and the District of Columbia, as well as numerous smaller communities. Since Feb. 7, 1942—the date the certificate provisions of the Natural Gas act became effective—the FPC had authorized nearly 69,000 mi. of pipelines and more than 1,600,000 h.p. in compressor units. These facilities were estimated to cost approximately \$5,300,000,000 and were designed to add nearly 26,000,000,000 cu.ft. of daily delivery capacity to the individual gas pipeline systems in the United States.

The commission, as a result of the U.S. supreme court decision of June 7, 1954, in the Phillips Petroleum company case, assumed jurisdiction over sales of natural gas in interstate commerce for resale made by independent producers. During the fiscal year, 1,029 applications for certificates were filed by independent producers, 3,003 were disposed of by the commission and 2,980 were pending, as of June 30, 1956.

Wholesale natural gas rate increase applications totalling approximately \$25,689,000 annually, filed by seven pipeline companies, were acted upon by the commission during the 12 months ended June 30, 1956. Of this amount, \$23,146,700 was suspended and \$2,542,300 accepted.

At the beginning of this period there was a backlog of \$134,000,600, making a total of \$157,847,300, in suspended rates requiring commission action during the year. Of this amount, \$7,457,000 was disallowed as not justified, \$14,137,300 was permitted to become effective and \$2,022,000 was permitted to be withdrawn by the companies. Including the carry-overs and the suspensions in 1956, there was a backlog on June 30, 1956, of \$134,231,000, of which \$113,990,300 was in effect under bond awaiting the commission's determination of the amounts to be allowed, and \$20,240,700 was still under suspension.

During the fiscal year, 4,442 rate filings were received from independent producers, including 748 rate increases totalling \$2,681,849, of which 130 amounting to \$10,187,102 were suspended and 618 amounting to \$2,494,747 were allowed.

At the beginning of fiscal year 1956 there was a backlog of \$11,055,017, making a total of \$21,242,119 in suspended independent producer rates requiring action during the year. Of this amount, \$1,218,773 was disallowed as not justified, \$2,197,650 was permitted to become effective and \$33,194 was permitted to be withdrawn by the producers. Including the carry-overs and the suspensions in fiscal year 1956, there was pending on June 30, 1956, a backlog of \$17,792,502 in suspended independent producer rates.

Electricity.—During the year ended June 30, 1956, the commission placed under license 3,008,350 kw. of hydroelectric generating capacity, representing an investment of approximately \$84,177,000. A total of 116 applications were filed and 112 licenses were completed. In the last 15 years the commission had placed under license 9,503,650 kw. of hydroelectric generating capacity, representing an estimated cost of \$2,230,731,000. As of June 30, 1956, there were 648 FPC licenses in effect involving a total installed capacity of 10,354,350 kw. and a claimed or estimated cost of \$3,024,177,000.

Electric utility generating plants in the United States pro-

duced a total of 583,623,488,000 kw.hr. during the year ended June 30, 1956. This amount was the largest on record to that date and 16% above the utility output for the year ended June 30, 1955. Combined utility and industrial production in the year ended June 30, 1956, reached 664,758,880,000 kw.hr., 14.9% above 1955.

Total installed capacity of utility generating plants on June 30, 1956, was 117,501,675 kw., including the net addition of 9,884,000 kw., or 9.2%, in the 12-month period ended on that date. Industrial generating capacity was 16,105,095 kw. on June 30, 1956, while the nation's total utility and industrial generating capacity reached 133,606,770 kw. on the same date.

For the year ended June 30, 1956, electric utility thermal plants burned 155,484,877 tons of coal, 1,184,508,642,000 cu.ft. of gas and 73,228,134 bbl. of fuel oil. These quantities were higher than those of fiscal year 1955 by 21.0% for coal, 1.7% for gas and 2.5% for fuel oil.

Water-Power Potentials.—Studies of water-power potentials indicated that, including projects under construction or authorized, the total undeveloped water power of the United States was approximately 86,900,000 kw., which, if developed, would be capable of generating about 358,400,000,000 kw.hr. annually. Of this undeveloped power 54%, or about 47,000,000 kw., was west of the continental divide, with 38%, or about 33,300,000 kw., in the north Pacific area, of which about 29,600,000 kw. was in the Columbia river drainage system. Of the remainder, California had approximately 7,800,000 kw., or about 9.5%, and the Colorado river basin 5,200,000 kw., or about 6%. The Missouri river basin had about 8,900,000 kw. of undeveloped water power, about 10.3% of the U.S. total. The largest concentration of undeveloped power east of the Mississippi river was in the north Atlantic drainage area, extending from the St. John river in Maine to the Rappahannock river in Virginia, with approximately 7,200,000 kw., or about 8.2% of the national total. (See also ELECTRICAL INDUSTRIES; GAS, NATURAL AND MANUFACTURED; PUBLIC UTILITIES.) (J. K. K.)

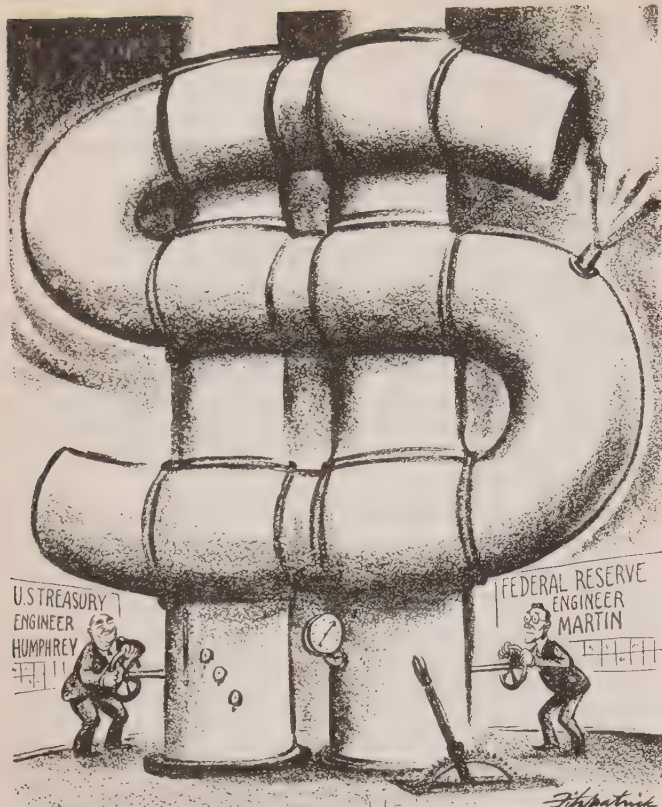
ENCYCLOPEDIA BRITANNICA FILMS.—*Light and Power* (1955); *Water Power* (1937).

Federal Reserve System. During 1956 the federal reserve system of the United States continued to pursue the policy of firm credit restraint which had been established late in the preceding year. The combination of federal reserve restraint, very high demands for funds and sharply lessened liquidity positions of financial institutions and business firms led to tight money and a credit squeeze.

The federal reserve system did not reduce either the money supply or the volume of bank credit outstanding during the year, but did effectively limit their increase well below the average of the postwar period and somewhat lower than in the corresponding period of 1955. During the 12 months ending with Oct. 1956 the increase in total loans and investments of all commercial banks was held to 2%, and growth in the active money supply—demand deposits and currency—to about 1½%.

In a situation in the economy of high utilization of resources and strong upward price pressures, the policy of monetary restraint pursued by the federal reserve system was designed to keep monetary expenditures within bounds in these circumstances and thereby to help maintain the stability of the dollar and promote sustainable growth in the economy.

Free Reserves.—The extent of credit restraint during the year was not fully indicated by the course of free reserves of member banks, that is, excess reserves minus borrowings from federal reserve banks. These were about a minus \$490,000,000 in Nov. 1955. After moving to an average of about a minus \$255,000,000 in Dec. 1955, Jan. 1956 and Feb. 1956, a tightening was



"JUST DON'T LET 'ER BLOW UP, BOYS," a cartoon of 1956 by Fitzpatrick of the *St. Louis Post-Dispatch* (Mo.)

indicated in late spring, as free reserves changed to an average of minus \$520,000,000 during April and May 1956. For the rest of the year, however, there was an improvement in this statistical measurement of the reserve position of member banks. Thus, free reserves averaged a minus \$197,000,000 in October and a minus \$294,000,000 in November. During the four weeks ended Dec. 19, 1956, free reserves were just barely on the negative side, with excess reserves almost equal to member bank borrowings.

During the second half of 1956 other factors had a cumulative effect which gave to a given negative reserve position of the member banks a far more restrictive effect. In the first place, the effect of the tightened reserve positions was heightened by the sharp decline in holdings of short-term government securities by money market banks and by the sharp drop in prices of government bonds which had taken place. Second, such a significant decline in holdings of short-term government securities by nonfinancial business firms had occurred as to lead to a greater tightening of this segment of the money market than evidenced by the free reserve position of member banks.

Open Market Operations.—Open market operations of the federal reserve system in the framework of growing pressure on the lending and investing ability of commercial banks continued to play an extremely important role. During Dec. 1955 the federal reserve entered the market in direct support of a treasury refunding for the first time since Sept. 1952, when it acquired on a when-issued basis \$167,000,000 of a new certificate issue. In the subsequent 12 months, however, no such direct support was given, and all changes in the total system portfolio of government securities resulted from transactions in treasury bills, either bought outright or under repurchase agreements. Open market operations, within the framework of restraint, were of assistance to banks in adjustment of their reserve positions as a result of temporary shifts in deposits and seasonal fluctuations in credit demands and currency in circulation.

In Jan. and Feb. 1956 the federal reserve sold or redeemed \$1,400,000,000 of government securities, primarily for the purpose of absorbing reserve funds made available by the seasonal return of currency from circulation and the reduction in required reserves associated with the seasonal decline in commercial bank deposits. Between the end of February and the last of July there was little net change in total federal reserve holdings of government securities. During Aug., Sept. and Oct. 1956 there was a net increase of about \$300,000,000. During Nov. and Dec. 1956, through increases primarily in treasury bills bought outright but also in those held under repurchase agreements, there was a further seasonal increase in the federal reserve portfolio of more than \$1,000,000,000.

Discount Rate.—Two rounds of increases in the discount rate occurred during 1956, following four such increases during the previous year. The discount rate is the rate on advances to member banks secured by obligations of the United States or discounts of eligible paper or advances thereon to member banks. During April 1956 ten federal reserve banks increased their discount rates from $2\frac{1}{4}\%$ to $2\frac{3}{4}\%$, and the federal reserve bank of Minneapolis, Minn., and San Francisco, Calif., advanced their rates from $2\frac{1}{2}\%$ to 3% . In Aug. 1956 the ten banks increased their discount rate from $2\frac{3}{4}\%$ to 3% . This brought the discount rates of all 12 federal reserve banks to 3% , where they remained the rest of the year.

During the last half of Nov. and Dec. 1956 the rate on new issues of treasury bills was above 3% , and as a result there was widespread discussion late in 1956 of the possibility of still another increase in the discount rate. Before the emergence of a credit restraint policy on the part of the federal reserve in April 1955, the discount rate had been $1\frac{1}{2}\%$.

During the year no changes were made by the board of governors in member bank reserve requirements, emphasis being placed rather on open market operations and discount rate policy. Member bank reserve requirements remained at the level set in the summer of 1954. Likewise, there were no changes during 1956 in margin requirements for credit extended by brokers and banks to finance new purchases and short sales of stock exchange securities.

Hearings were held concerning federal reserve policy before the subcommittee on economic stabilization of the joint economic committee of congress in Dec. 1956. While there was some congressional and business criticism of tight money, more and more, there was general approval of restrictive federal reserve policies in an environment of high boom and inflationary pressures.

(See also BANKING; CONSUMER CREDIT.)

(J. K. L.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Federal Reserve System* (1950).

Federal Trade Commission. The Federal Trade Commission was created in 1914 by the congress of the United States to safeguard free and fair competition in the nation's multibillion dollar annual sale of goods and services.

The commission consists of five members appointed to overlapping seven-year terms by the president of the United States and confirmed by congress. Laws enforced by the commission are: the Federal Trade Commission act, the Clayton Antitrust act (including the Robinson-Patman and Antimerger amendments), the Wool and Fur Products Labeling acts, the Export Trade act and the Flammable Fabrics act. The FTC also has duties under the Lanham Trade Mark act.

During 1956 the commission's principal target was illegal mergers. Typical of recent complaints were those against four of the nation's biggest dairies which had acquired a total of 290 small dairies; against one of the country's four largest sporting

goods manufacturers for having acquired one of the other three; and against a paper products company for having acquired three other pulp and paper companies. In addition, the commission ordered a principal manufacturer of safety and common pins to divest itself of the acquired properties of a competitor; a leading farm magazine was ordered to divest itself of the name and subscription list of a purchased competitor; and a paper product company was ordered to limit the amount of a competitor's stock it held.

During the fiscal year, the commission set postwar records for the number of complaints and orders issued both against monopolistic and deceptive practices. The former included complaints against favoured treatment of chain stores by their food suppliers, and against exclusive dealing contracts in such diversified fields as hearing aids, liquefied petroleum gas and outboard motors. Price discrimination was attacked in such fields as automotive parts, materials handling equipment and candy. Trade restraint cases were brought against three tire manufacturers and the manufacturers of fibre rope, cordage and twine.

The commission issued 150 complaints and 133 orders against firms charged with using deceptive practices. These, of course, covered a wide range of business methods and advertising. Hardest hit by the FTC was the false or misleading advertising of furs, woollens, health and accident insurance, household products, make-money-at-home schemes, cure-all medicines and cosmetics. Also attacked was bait advertising in which unavailable or spurious "bargains" were advertised simply to lure customers into stores.

The commission also levelled complaints at correspondence schools which made false claims for the ease of learning skills or the job opportunities for graduates.

In addition to its mandatory procedures, the FTC also conducts trade practice conferences in which rules of behaviour are promulgated for an entire industry. These rules serve as guides to what the commission and the industry consider fair practice.

Other work of the FTC includes stipulations whereby individual firms agree to discontinue objectionable practices. This informal method is used only when the commission has reason to believe that discontinuance of the evil can be assured without resort to formal complaint and order.

The five members of the commission in 1956 were: John W. Gwynne, chairman; Robert T. Secrest, Sigurd Anderson, William C. Kern and Edward T. Tait (newly appointed and not yet confirmed by the U.S. senate.) (J. W. Ge.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Big Enterprise and the Competitive System* (1954); *Competition and Big Business* (1953).

Federated Malay States: see MALAYA, FEDERATION OF; SINGAPORE.

Fencing. The 1956 fencing season was climaxed in the United States by the national championships, which were held in New York city, June 7–15. The men's foil championship was won by Sewall Shurtz, U.S. navy and Los Angeles, Calif.; Albert Axelrod, of the Salle Santelli, New York, and Daniel Zukantz, Fencers club, New York city (both former champions) tied for second and finished second and third respectively on panches. Abram Cohen of the Fencers club was the only successful defending champion. He retained the *épée* title, with Lieut. William Andre, U.S. navy, second, and Sewall Shurtz, U.S. navy, third. Tiber Nyilas of the Salle Santelli, won his seventh sabre crown. His teammates Alan Kwartler and George Worth, former champion, were second and third respectively. Former champion Janice Lee Romary of Los Angeles defeated the defending champion Maxine Mitchell of the Los Angeles Athletic club in a fence-off for the women's title. Judy Goodrich, 16-year-old high school

girl from Lapeer, Mich., was third.

In the team events, the Fencers club of New York was first in the foil team championship, the Salle Santelli second and the U.S. air force third. The *épée* team championship was won by the Salle Csiszar of Philadelphia, Pa., the third naval district team was second, and the Annapolis navy officers were third. The Salle Santelli retained the team sabre crown; the Salle Csiszar placed second; and Maryland was third.

The two leading women fencers of the United States, Janice Lee Romary and Maxine Mitchell, formed a composite team, and fencing without a third member, won the women's team championship. Forfeiting three bouts in each match, they each went through the entire competition undefeated. The Salle Santelli defeated the Fencers club for second place.

At the completion of the national championships the U.S. Olympic Fencing committee selected the U.S. Olympic fencing team. (For the winners of the fencing events in the 1956 Olympic games, see OLYMPIC GAMES.)

The Southwest Sectional championships were held in Abilene, Tex., on May 5–6. Jack Carnell of the North Texas division won the men's foil. The *épée* crown was won by Robert Miller of the Gulf Coast division. Jack Carnell won his second title by taking the sabre and Mary Taylor of North Texas division won the women's title.

The North Atlantic championships were held in Towson, Md., on May 19–20. The foil title was won by Joseph Levis of Boston, Mass.; Roger Jones (U.S. navy) won the *épée* title; and R. Richard Dyer of Philadelphia took the sabre crown. Louise Dyer kept pace with her husband, Richard, by winning the women's title.

The Pacific Coast championships were held in Los Angeles on May 19–20. The foil title was won by Gerard Biagini of the Olympic club of San Francisco, Calif.; Albert Lambert of the Berkeley Fencing club won the *épée* and the sabre title went to Werner Kirchner of the Cavaliers (Los Angeles). Maxine Mitchell of the Los Angeles Athletic club won the women's championship. (W. A. Dw.)

Fertilizers: see AGRICULTURE; CO-OPERATIVES; TENNESSEE VALLEY AUTHORITY.

FHA (Federal Housing Administration): see HOUSING.

Fiction: see AMERICAN LITERATURE; BOOK PUBLISHING AND BOOK SALES; CANADIAN LITERATURE; ENGLISH LITERATURE; FRENCH LITERATURE; GERMAN LITERATURE; ITALIAN LITERATURE; JEWISH LITERATURE; LATIN-AMERICAN LITERATURE; LITERARY PRIZES; RUSSIAN LITERATURE; SPANISH LITERATURE. **Figs:** see FRUIT.

Fiji. Fiji is a British colony, consisting of 322 islands (106 inhabited) in the Pacific ocean, about 1,100 mi. north of New Zealand. Total area: 7,083 sq.mi., including the main islands Viti Levu (4,011 sq.mi.) and Vanua Levu (2,137 sq.mi.), and Rotuma dependency (18 sq.mi.), 400 mi. to the north. Pop. (1946 census) 259,638; (1955 est.) 345,164 including Fijians 42.5%, Indians 48% and Europeans 2.6%. Religion: Fijians are Christian (80% Methodist); Indians, 83% Hindu and 17% Moslem. Capital: Suva, on Viti Levu, pop. (1946 census) 113,398; (1952 est.) 32,000. Governor in 1956, Sir Ronald Garvey.

The governor of Fiji is also governor of Pitcairn ex officio and is responsible for the general exercise of British protection of Tonga (*q.v.*).

Pitcairn.—A British colony by settlement, Pitcairn is situated in the Pacific ocean midway between Australia and South America. Area: 2 sq.mi. Pop. (Dec. 1954 est.) 136, Anglo-Polynesians descended from "Bounty" mutineers. Dependencies: Oeno, Henderson and Ducie islands (total area 17 sq.mi.). Reli-

gion: Seventh-Day Adventist. Chief magistrate in 1956, Parkin Christian.

History.—Figures of population published in 1956 showed that the Indian population continued to increase at a faster rate than the Fijian. The total population of 345,164 represented an increase of 4% over the figure for the previous year, Indians exceeding Fijians by more than 20,000.

Improvements in communications were effected by an automatic telephone exchange in Suva and modifications to Nadi airport. The Fiji battalion which had served in Malaya since 1952 returned to Suva in June.

Elections for a new legislative council were held in August. An unofficial member of the council, W. G. Johnson, produced a plan for solving the most pressing social and political issue in the colony, the claim of non-Fijians to land. Under the terms of cession land could not be sold to non-Fijians, but the plan proposed the establishment of a board to control the orderly development of land unused by Fijians but which other peoples; *i.e.*, Indians, could develop. The plan aroused great interest but had yet to be discussed by the government. The third South Pacific conference was held in Fiji at the end of April.

(D. W. F.)

Fine Arts: *see* ARCHITECTURE; ART EXHIBITIONS; DANCE; MUSIC; THEATRE.

Finland. An independent republic of northern Europe, Finland has an area of 130,119 sq.mi., including the Åland Islands. Pop.: (1950 census) 4,029,803; (1956 est.) 4,276,000. Capital: Helsinki, pop. (1950 census) 369,380; (1954 est.) 396,343. Other cities (1954 est.): Turku (Åbo) 107,519; Tampere (Tammerfors) 107,577; Lahti 46,822. Language and nationality: 90% Finnish, 10% Swedish. Religion: Lutheran Christian. President to March 1, 1956: Juho K. Paasikivi, thereafter Urho Kekkonen. Prime minister after March 3, 1956: Karl August Fagerholm.

The Åland Islands, a Swedish-populated archipelago belonging to Finland, lie to the southwest of Finland at the mouth of the Gulf of Bothnia. Area: 581 sq.mi. Pop. (1950 census) 21,690. Chief town: Mariehamn, pop. 3,273.

History.—The campaign for the presidency was well under way before the end of 1955. In a sense it was the first real campaign, for traditionally the office had sought the man, and an outstanding elder statesman had been chosen. But 85-year-old Juho Paasikivi was ready to retire, and six candidates entered the field, each with party backing. Urho Kekkonen, Agrarian prime minister, and Karl August Fagerholm, speaker of parliament and head of the Social Democrats, were the leading contenders. In mid-January 1956, 300 electors were chosen by popular vote, and in mid-February they made their choice. The first vote was scattered, and only on the third ballot was Kekkonen chosen over Fagerholm by 151 to 149.

Soon after the decision of the electors, the president-elect entrusted the formation of a ministry to Fagerholm. On March 3 the new cabinet took office, a coalition of Social Democrats and Agrarians with six posts each, and the Finnish Peoples' and Swedish Peoples' parties with two posts each; Ralf Törngren of the Swedish party became foreign minister.

During the time of the election there developed a price and wage controversy that resulted in a general strike just as the new regime took office. In Dec. 1955 the price control law had been allowed to lapse. In Jan. 1956 the dairy interests raised milk prices 30% to 40% and all dairy products about 18%. The Trade Union federation demanded that the increases be rescinded or that wages be raised 6.7%. The farmers threatened a delivery stoppage. By March 1 the impasse was complete, and the general

strike was declared. From 200,000 the number of strikers rose to about 440,000, and the economic activity of the nation came to a standstill. Only after 19 days was a solution reached, providing wage increases of about 11% for the workers, and promises for the farmers. Approximately \$40,000,000 of wages had been lost, and more than \$200,000,000 of production. The nation recognized the dangers of the wage-price spiral that had already brought a high degree of inflation; but each special interest group was concerned primarily with its own advantage. Rents and farm prices remained low, and a healthy balance had not been achieved in the national economy. Many agreed that the general strike weapon had been unwisely invoked, and that broad-based, vigorous rethinking and economic planning was essential.

The pleasure of the Finns at the return of the Porkkala territory by the U.S.S.R. was dimmed by the reality that faced them when they moved into Porkkala at the end of January. Houses had fallen into ruin, roads had to be rebuilt and the land had to be prepared anew for cultivation. Problems of resettlement were complicated by the decision to confiscate a portion of the area for Finnish defense purposes. It was estimated that 10 to 15 years would be necessary to restore Porkkala to its condition prior to 1944.

(F. D. S.)

Education.—Schools (1954-55): primary 6,481, pupils 564,807, teachers 23,298; secondary 373, pupils 135,348; vocational 473, pupils 34,792; teachers (1953) 3,360; people's high schools, etc. (1953-54) 180, pupils 53,980, teachers 1,110; teacher-training (primary) schools (1954-55) 15, students 3,680. Institutions of higher education (1954-55) 15, students 15,887, teaching staff 1,278.

Finance and Banking.—Monetary unit: markka, with an exchange rate of 230 mk to the U.S. dollar. Budget: (1954, final) revenue 215,570,000,000 mk, expenditure 213,660,000,000 mk; (1956 est.) revenue 205,900,000,000 mk, expenditure 205,880,000,000 mk. Internal debt (Nov. 1955) 53,900,000,000 mk, external debt 54,500,000,000 mk. Currency circulation (March 1955) 44,500,000,000 mk; (March 1956) 50,000,000,000 mk. Deposit money: (March 1955) 37,800,000,000 mk; (March 1956) 44,000,000,000 mk. Gold and foreign exchange: (central bank, Jan. 1955) U.S. \$243,900,000; (Jan. 1956) U.S. \$224,800,000.

Foreign Trade.—(1955) Imports 176,960,000,000 mk; exports 181,250,000,000 mk. Main sources of imports: U.K. 20.3%; U.S.S.R. 14.7%; other

SOVIET MARSHAL A. M. VASSILEVSKY (left) absorbed in conversation with an unidentified man, as Soviet deputy first premier Mikhail Pervukhin signs his name in the guest book of the Finnish diet, Jan. 26, 1956, after official ceremonies marking the return of the Porkkala enclave to Finland by the U.S.S.R.



soviet bloc 12.4%; Latin America 7.4%; U.S. and Canada 5.4%; German Federal Republic 9%; other O.E.E.C. (Organization for European Economic Cooperation) countries 27.4%. Main destinations of exports: U.K. 24%; U.S.S.R. 17.5%; other soviet bloc 8.3%; Latin America 5.5%; U.S. and Canada 5.7%; German Federal Republic 9.1%; other O.E.E.C. countries 23.3%. Chief exports: wood 39%, wood pulp 26%, paper 22%.

Transport and Communications.—Roads (1953) 63,460 km. Motor vehicles in use (March 1956): passenger 88,504; commercial 52,105. Railways (1955): 5,046 km., of which state 4,859 km.; (1954) 2,072,000,000 passenger-km.; freight (1955), 4,200,000,000 ton-km. Navigable inland waterways (1953) 49,900 km. Merchant shipping vessels (100 gross tons and over, July 1955) 346; total tonnage 730,573. Air transport (1955): 120,972,000 passenger-km.; freight, 1,095,600 ton-km. Telephones (Jan. 1955) 433,001. Licensed radio receivers (1954) 971,000.

Agriculture.—Production (metric tons, 1955; 1954 in parentheses): wheat 179,000 (235,000); rye 123,000 (132,000); barley 254,000 (262,000); oats 870,000 (799,000); potatoes 1,067,000 (1,090,000); beet sugar, raw 23,000 (37,000). Livestock (June 1954): cattle 1,885,094; sheep 908,093; goats 4,245; reindeer 140,754; pigs (Dec. 1954) 507,000; horses (Dec. 1954) 311,000. Fish landed (1954) 65,500 metric tons.

Industry.—Electricity production (1955) 6,744,000,000 kw.hr. Production (metric tons, 1955): pig iron 114,840; crude steel 186,840; copper, smelter 27,840; cement 1,010,400; pyrites (1954) 1,071,000; copper ore (metal content, 1954) 22,600. Forest products (cu.m., 1954): sawn softwood 4,759,000; sawn hardwood 42,000; plywood (1955) 342,200; (metric tons, 1955) cellulose 1,825,800; cardboard and fibreboard 423,900; newsprint 544,600; paper other than newsprint 467,300; pulp (1954) mechanical 878,000, chemical 1,572,000.

Fires and Fire Losses.

For several months in 1955, fire losses in the United States were slightly less than in the corresponding period of the prior year, but the year ended with a loss record about 1% higher than the previous year. Despite the increase in the total dollar loss from fires, the number of fires dropped from 854,116 in 1954 to 822,392 in 1955. This was the lowest point in the number of losses since 1949.

It must be remembered that the rapidly expanding economy has increased the incidence of fire hazards. Price inflation has exaggerated the fire damage losses. The population increase has also affected the potential of fire loss. With these factors as a background, coupled with the reduction in the number of fires, one might be justified in holding the opinion that the line was being held in the battle against fire.

The 1956 fire loss record tended to belie this conclusion. For the first eight months of 1956, losses totalled \$661,085,000. This was a 9.7% increase over the first eight months of 1955. The only bright period was in the month of February when the losses were less than in the corresponding months of 1955.

Matches and smoking continued as the principal causes of fire losses when measured in terms of number of claims. Misuse of electricity produced the largest dollar loss.

(See also DISASTERS; FORESTS.)

(L. J. A.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Insurance Against Fire Losses* (1952).

Fisheries.

The world catch of fish, crustaceans, mollusks, etc., amounted to 62,412,000,000 lb. in 1954, according to information released in 1956 by the Food and Agriculture Organization of the United Nations. Asiatic countries, excluding the U.S.S.R., produced 43.7% of the total; European countries, excluding the U.S.S.R., 26.1%; North America, 13.1%; U.S.S.R., 8.8%; Africa, 5.6%; South America, 2.3%; and Oceania, 0.4%. Fishing fleets throughout the world were expanded in 1956, improvements in the design and operation of fishing gear continued, and exploratory operations were conducted in many areas to discover new fishing grounds.

In recent years much thought had been given to the problem of obtaining agreement among nations as to the breadth of territorial waters. This resulted primarily from a rapid increase in the total world catch of fish and shellfish, expansion of fishing activities by fishermen from various nations off the shores of other countries, and concern over the ability of stocks of fish to support increased fishing. The International Law commission, appointed to consider the problem, voted in June 1956 after five years of discussion to make no decision on the breadth of these waters. The commission approved the following statement relative to jurisdiction over coastal waters:



FIRE HOSES POURING WATER into the burned-out shell of the abandoned Wanamaker department store building in New York city which caught fire July 14, 1956. Six hundred firemen were summoned to bring the fire under control

(i) The Commission recognizes that international practice is not uniform as regards the delimitation of the territorial sea.

(ii) The Commission considers that international law does not permit an extension of the territorial sea beyond 12 mi.

(iii) The Commission, without making any decision as to the breadth of the territorial sea within that limit, notes, on the one hand, that many states have fixed a breadth greater than three miles and, on the other hand, that many states do not recognize such a breadth when that of their own territorial sea is less.

(iv) The Commission considers that the breadth of the territorial sea should be fixed by an international conference.

The International Law commission's statement was expected to increase pressure to have the breadth of territorial waters set at 12 mi. rather than the commonly accepted 3 mi., or the 200 mi. claimed by some nations. In mid-1956, the Canadian government announced that it was considering such action. In Aug. 1955, the Soviet Union refused to renew the Anglo-Soviet Fishing treaty of 1930 by which British trawlers, and no others, could fish up to 3 mi. from the north Russian coast rather than 12 mi. However, in 1956 the treaty was renewed, permitting British craft to continue normal fishing operations on this coast.

In an effort to gain new customers for fish and shellfish and hold existing markets, considerable attention was given during 1956 to improving the quality of fishery products. In the United States, quality standards that proved so valuable as a marketing aid for agricultural products became available for fishery products. In August voluntary standards for frozen fried fish sticks became effective, the first quality standard for a fishery product in the United States.

In Canada uniform minimum standards for plants processing fish and shellfish products were established by the department of fisheries during 1956, and a voluntary program of plant inspection was instituted in Nova Scotia, New Brunswick and Prince Edward Island. The setting of minimum standards of construction, equipment and sanitation of fish and shellfish plants was a further step in the program designed to maintain peak quality from the time fish were caught until they reached the customer.

A fish processing technologist meeting in Rotterdam, Neth., during 1956 considered the possibility of using antibiotics to keep fish fresh. Investigations showed that aureomycin and other antibiotics could keep fish in a fresh condition two or three times as long as was possible with conventional ice-storage methods. If antibiotics were approved for use in preserving fish (as they had been for poultry in some countries) vessels could stay at sea for longer periods, an entire catch could be marketed at top prices and consumers would receive better quality products.

Fishery research and management officials and commercial fishermen used numerous electronic devices in their activities. Fish "shockers" were used in streams to temporarily "knock out" fish to permit population counts. Electric weirs protected fish by jolting the life out of destructive and valueless lamprey eels, or they could be used to guide fish away from areas where they might be injured, or to counting stations. Electric fences were used to keep Kodiak bears away from sections of salmon streams where they fed on spawning fish. Sonic trackers attached to the backs of salmon flashed information to recording instruments for as long as 100 hours on every twist and turn of the fish, thereby furnishing valuable information on the effectiveness of fishways over dams or natural waterfalls. An underwater telemeter was developed to supply continuous information on the exact distance of commercial trawls or nets below the surface of the water. Improvements were made in underwater television developed to study fish in their natural habitat and to learn how to make fishing gear more efficient and effective. Besides these devices, fishermen used fathometers to measure ocean depths and locate fishing banks; electronic fish finders to locate schools of fish; radar to guide ships and planes; Loran to determine exact location; and radio for communication.

Data released by the U.S. fish and wildlife service indicated the sums expended to learn more about the world's fishery resources and to assist the fishing industry. Expenditures in the United States and Alaska on fishery research and services for commercial fisheries amounted to \$13,975,000 in the year ended June 30, 1956. Of this amount, \$9,292,000 was spent by the U.S. fish and wildlife service, \$4,015,000 was expended by states and \$668,000 by international commissions. More than 60% of the funds was spent on research and services relating to four species—salmon, \$4,733,000; tuna, \$1,504,000; oysters, \$1,068,000; and sardines, \$1,184,000.

The trend of European fishing fleets to expand operations to more distant northern grounds continued in 1956. Nearly half of all fish landed in 1955 at Hull, Grimsby and Fleetwood in Great Britain by distant-water trawlers came from Arctic grounds, principally Bear Island and the White (Barents) sea. A slight increase in the temperature of northern Atlantic waters made it possible for cod to move into vast new areas. Large stocks of cod were found near Greenland, indicating that fishing in that area could be greatly expanded. A large portion of the European fishing fleet became dependent upon the cod in northern waters.

The Russian Atlantic fishing fleet, reported to be organized on a naval basis, with big factory ships for processing catches and groups of trawlers for catching the fish, had expanded rapidly in recent years, and a vast program for increasing catches of fish had been prepared. Helicopters and "spotter" ships were used to follow and locate fish shoals. During 1956 the Soviet fleet was understood to include twenty-four 10,000-ton factory ships built for them in Germany. Twenty big trawlers were constructed in Britain alone for the Soviet Union. (See also MARINE BIOLOGY.)

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ENCYCLOPÆDIA BRITANNICA FILMS.—*Lobster town* (The Story of a Community) (1955); *New England Fishermen* (1938); *Salmon Story* (1950); *Shell Fishing* (1938).

Fishing: see ANGLING.

Flax: see LINEN AND FLAX.

Floods and Flood Control. By 1956 the flood control program of the U.S. army corps of engineers had grown to be one of the major elements of the federal public works activity. The active flood control program, including the major project for the lower Mississippi river but excluding multiple-purpose improvements, involved more than 760 projects with a total estimated cost of \$6,300,000,000. Of this amount, \$2,600,000,000 had been appropriated by congress, leaving a total of \$3,700,000,000 required for completion. If the multiple-purpose projects which serve flood control purposes were added, the estimated cost of the total authorized flood control program would become \$9,500,000,000, of which a total of \$4,000,000,000 had been appropriated through fiscal year 1956. The projects in full or partial operation were preventing flood damages of \$500,000,000 a year and, in addition, producing additional benefits of \$250,000,000 a year. The total annual value of this program, \$750,000,000 a year, was being achieved at an annual cost of slightly more than \$200,000,000. The flood control program was paying off at the rate of more than \$3 for each \$1 invested, and this did not take into account the values which could not be measured in monetary terms, such as the saving in life and the economic security of hundreds of urban communities and farming areas.

Much remained to be done in the field of flood damage prevention. The potential flood losses in the United States on an average annual basis without flood control works amount to \$900,000,000 a year. These are estimated losses for the main river and major tributary valleys and do not include flood losses in many small upstream tributaries. The \$500,000,000 reduction in the \$900,000,000 annual loss, presently being achieved by the operating flood control program, still leaves a balance of \$400,000,000 annual loss.

Severe Floods in the United States.—Some of the severer floods in 1956 may be summarized as follows:

Widespread general storms during January and February affected most of northern California, southern Oregon and western Nevada. The rainfall from these series of storms was not particularly severe, but, because of the saturated conditions existing on most watersheds as a result of severe floods in Dec. 1955, moderate floods occurred on several streams.

Floods on Feb. 21 in the Esquatzel Coulee basin in eastern Washington exceeded any flows previously known. The floods occurred as a result of runoff caused by chinook winds and heavy rain on above-normal snow cover.

Heavy rainfall during the period March 5-8, 1956, augmented by melting snow in western New York and northern Pennsylvania, caused major flooding in the upper Allegheny and lesser flooding on the lower river and on the Ohio river below Pittsburgh, Pa. The towns most severely damaged in the Allegheny river basin were Salamanca, N.Y., and Warren, Oil City and Meadville, Pa.

Heavy rains in north central Texas during April and May caused serious flooding in Brown, Coleman and San Saba counties. Elm creek reached the highest stage in 24 years of record. The most extensive flooding occurred in the Pecan bayou in and below the town of Brownwood.

Also in May, heavy local rain of as much as eight inches in a reported three-hour period resulted in damaging floods in and near Indianapolis. Major rivers such as the White and Wabash were not seriously affected. Especially severe flooding occurred

along Eagle creek, Fall creek and Pogues run in and adjacent to the city of Indianapolis.

The mountain snow pack was extremely heavy over the headwaters of the upper Columbia river basin during the winter and spring. The first major flooding of the season began in the Kootenai river valley in northern Idaho on May 20. Flooding occurred at numerous points late in May throughout the Columbia basin, including the Clearwater and Snake rivers in Idaho, the Payette at Emmett, Ida., the Yakima river at Parker, Wash., and most other east slope Cascade streams in Washington.

Severe local thunderstorms occurred in the vicinity of Reno, Nev., in July, causing excessive runoff from Peavine and Galena creeks. About 60 blocks in the city of Reno were flooded. Severe local flooding occurred in the south and east portions of Denver, Colo., during the night of July 31 as a result of heavy local rainfall.

In August a severe storm, accompanied by hurricane-force winds and flooding rain, was described as the worst to hit the Crosby-Ironton area of Minnesota since 1915. Also in August severe rainstorms caused heavy flooding in Chartiers creek, south of Pittsburgh, Pa.

Flood Control Appropriations.—Appropriations by the U.S. congress for the civil works program of the corps of engineers in fiscal year 1957 gave leading place to flood control projects. Of the amounts appropriated for construction, under "construction general," flood control projects received \$160,631,500, compared with \$158,010,000 for multiple-purpose projects which serve flood control, navigation and hydroelectric power purposes and compared with \$128,956,000 for navigation projects. In addition, the big Lower Mississippi River and Tributaries Flood Control project received \$62,791,000, most of which was for construction. Smaller sums were appropriated for planning, surveys and maintenance of flood control projects.

Some of the leading individual flood control appropriations for fiscal year 1957 were:

Los Angeles County Drainage area, California . . .	\$17,500,000
Central and Southern Florida project, Florida . . .	8,750,000
Tuttle Creek reservoir, Kansas . . .	9,000,000
Buffalo bayou, Texas . . .	6,900,000
Eagle Gorge reservoir, Washington . . .	6,300,000

Multiple-purpose projects serving both flood control and hydroelectric power included the following:

Table Rock reservoir, Arkansas and Missouri . . .	\$14,750,000
Hartwell reservoir, Georgia and South Carolina . . .	10,000,000
Garrison reservoir, North Dakota . . .	16,000,000
The Dalles dam, Oregon and Washington . . .	42,457,000
Oahe reservoir, South Dakota . . .	27,500,000

(E. C. I.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Conservation Road* (1947); *Man's Problem* (1953); *Seeds of Destruction* (1948).

Florida. The extreme southeastern state of the United States. Florida was admitted to the union in 1845 as the 27th state. It is called the "Sunshine state" and sometimes the "Peninsula state." Area: 58,560 sq.mi., of which 4,298 sq.mi. is water surface. Population (1950 census): 2,771,305, of whom 1,813,390 were urban dwellers and 957,415 were rural; 2,166,047 were white and 605,258 were nonwhite. The 15 cities of more than 25,000 persons in 1950 were: Miami 249,276; Jacksonville 204,517; Tampa 124,681; St. Petersburg 96,738; Orlando 52,367; Miami Beach 46,282; Pensacola 43,479; West Palm Beach 43,162; Fort Lauderdale 36,328; Lakeland 30,851; Daytona Beach 30,187; Tallahassee (the capital) 27,237; Gainesville 26,861; Key West 26,433; Panama City 25,814. On July 1, 1956, the state population was estimated at 3,770,000, according to provisional figures of the U.S. census bureau.

History.—The state elective administrative officers in 1956, whose terms were to expire in Jan. 1957, were Leroy Collins,

governor; R. A. Gray, secretary of state; Richard W. Ervin, attorney general; Ray E. Green, comptroller; J. Edwin Larson, state treasurer; Thomas D. Bailey, superintendent of public instruction; Nathan Mayo, commissioner of agriculture.

The state legislature in 1955 proposed 11 amendments to the state constitution to be voted on at the general election of Nov. 6, 1956. In brief, these were as follows: (1) revising article v relating to the judicial department, the most important change being the establishment of district courts of appeal; (2) providing for home rule in Dade county; (3) abolishing the court of record in Escambia county and vesting all its jurisdiction in the circuit court of that county; (4) provisions relating to regular and extra sessions of the legislature whereby the members of the legislature may extend the regular session beyond the 60-day period, and providing also for extra sessions called by members of the legislature; (5) relating to apportionment of the senate and house of representatives; (6) providing for two judges of the criminal court of record in Duval county; (7) abolishing the office of county special tax school district trustee, and transferring the duties to the county board of public instruction; (8) providing for the appointment of the county superintendent of schools in Duval, Sarasota, Dade and Pinellas counties by the county board of public instruction; (9) abolishing the office of county solicitor in Dade county and transferring the duties to the state's attorney of the judicial district in which Dade county is located; (10) relating to fees and compensations of county offices of Escambia county; (11) authorizing the legislature to establish civil service systems and boards for municipal, county and state employees and for municipal, county and state officers not elected by the people or appointed by the governor.

After the regular session of the legislature in the spring of 1955 an extraordinary session was called for June 6, 1955, on the subject of apportionment of representation in the legislature. This session lasted until Aug. 10, resumed Sept. 26 and continued to Sept. 29, and resumed again June 4, 1956. The session was deadlocked on the problem of apportionment, so it recessed June 11, 1956, until Nov. 6, 1956.

In the Nov. 6, 1956, election, Pres. Dwight D. Eisenhower carried Florida over his Democratic opponent, Adlai E. Stevenson, by more than 150,000 votes. All the Democratic nominees for state offices were elected by large majorities. However, William C. Cramer, the only Republican representative in congress from Florida, was re-elected. All the proposed amendments to the state constitution were approved by the electorate except that concerning the reapportionment of the state legislature.

The question of racial segregation in the public schools and the problem of the Mediterranean fruit fly were pressing, so a second extraordinary session of the legislature was called for July 23, 1956, and continued to Aug. 1, when it was dissolved by the governor. In addition to the enactment of statutes on these problems, the legislature took steps to alleviate crowded conditions in the state prisons and other state institutions and to expand the work of the parole commission. A statute was passed to forbid the use of false and misleading advertisements in real estate, and the legislature appropriated \$800,000 to complete the construction of the teaching hospital building at the University of Florida medical school.

Education.—Enrolment in the public schools for the year 1955-56 in grades 1 through 12 was as follows: white, 588,338; Negro, 164,569; total, 752,907. Kindergartens: white, 2,292; Negro, 194; total, 2,486. Junior colleges (grades 13 and 14): white, 3,590; Negro, 167; total, 3,757. The total enrolment in the public schools of Florida in 1955-56 was 759,150. There were 1,219 elementary and 472 secondary public schools, 38 kindergartens and 5 junior colleges in the state, of which there were 830 white and 389 Negro elementary schools, 329 white and 143 Negro secondary schools, 36 white and 2 Negro kindergartens and 4 white and 1 Negro junior colleges. These schools had instructional staffs (exclusive of 200 supervisors) of 26,363 teachers and 1,112 principals, of whom 20,481 teachers and 857 principals were employed in schools for whites and 5,882 teachers and 255 principals were employed in schools for Negroes. There was a total

of 27,675 instructional positions in the school year 1955-56.

Social Insurance and Assistance, Public Welfare and Related Programs.—Florida disbursed for state welfare through the state welfare board \$58,535,572.86 in 1955-56. From grants by the federal government the state received in 1955-56 for old-age assistance \$25,771,871.56; dependent children \$11,818,898.16; aid to the blind \$1,128,706.28; aid to the disabled \$625,060.83; total \$39,344,536.83. Disbursements for old-age assistance were \$38,623,446.53; dependent children \$13,989,635.57; aid to the blind \$1,620,466.14; aid to the disabled \$582,611.50; total \$54,816,159.74. Administrative and other welfare services amounted to \$3,719,413.12, which included \$1,719,432.78 federal funds. The total net addition to the unemployment compensation fund was \$12,228,275.12, while the gross unemployment benefit payments were \$11,414,041.02 with net benefit payments of \$11,333,454.35.

The parole commission had an appropriation for 1956-57 of \$301,250. The state supports tuberculosis hospitals at Orlando, Tampa, Tallahassee and Lantana, and the appropriation for the Tuberculosis board which administers these institutions for 1956-57 amounted to \$4,800,000. The state also supports hospitals for the insane at Chattahoochee and Arcadia, the Florida farm colony for the feeble-minded at Gainesville and the Florida school for the deaf and blind at St. Augustine. The appropriations for these institutions for 1956-57 were \$8,735,018, \$2,247,844 and \$923,004, respectively.

The population of the state prisons and other institutions as of Aug. 31, 1956, was as follows: state prison at Raiford, 2,276; Glades state prison farm at Belle Glade, 353; industrial school for boys at Marianna, 708; industrial school for girls at Ocala, 99; industrial school for girls at Forest Hill, 92; Florida correctional institution for women at Lowell, 267; the Apalachee correctional institution at Chattahoochee, 237; the state hospital at Chattahoochee and Arcadia, 8,130; the farm colony at Gainesville, 1,215.

Communications.—The total highway and street mileage in the state at the end of the year 1955 was 56,748 mi., of which 28,064 mi. were paved and 4,145 mi. were constructed of gravel or stone. Disbursements for the calendar year 1955 were \$78,141,473.09 for construction and \$12,540,543 for maintenance. Effective July 1, 1956, the state road department changed from a calendar year to a fiscal year. For the period Jan. 1, 1956, to June 30, 1956, \$35,692,305.59 was spent for construction and \$6,615,520.30 for maintenance. The state road department budget for the fiscal year July 1, 1956, to June 30, 1957, was \$215,775,000 for construction and \$17,771,716 for maintenance. Florida had in 1955 approximately 4,860 mi. of railroad exclusive of yard tracks.

Banking and Finance.—On June 30, 1956, there was a total balance in the state treasury of \$138,006,980.87 with outstanding warrants of \$20,529,572.77. On June 30, 1956, there were within the state 88 active national banks with deposits amounting to \$2,248,542,000 and 156 state banks and trust companies with deposits of \$1,194,270,693.64. There were also nine

industrial banks with deposits of \$11,533,187.79. These represented total deposits of \$3,454,345,881.43, a gain of \$348,412,875.43 in the fiscal year.

The total revenue receipts for the state of Florida for the fiscal year ending June 30, 1956, amounted to \$474,716,666.63. Included in this sum were \$90,200,300.69 from gasoline tax, \$86,094,584.34 from sales and use tax, \$36,217,030.72 from beverage tax, \$21,793,692.64 from cigarette tax, \$36,884,492.64 from motor vehicle licenses and \$24,456,207.24 from racin fees, licenses and taxes. The state expended \$49,431,902.75 for education in the fiscal year ending June 30, 1956. State investments par value securities as of June 30, 1956, was \$158,918,474.15.

Agriculture.—On Jan. 1, 1956, the livestock resources of the state were as follows: 1,421,000 beef cattle and calves; 178,000 milk cows; 427,000 swine; 5,000 sheep; 35,000 horses and mules.

The total income from the sale of agricultural commodities for the year 1955 was \$626,171,000. Revenue from the sale of cattle and hogs amounted to \$50,247,000; poultry and eggs \$29,292,000; dairy products \$57,054,000; truck crops approximately \$164,370,000; citrus fruits \$201,458,000; greenhouse and nursery products \$30,221,000; and from field crops: tobacco \$22,130,000, potatoes \$26,275,000, corn \$1,042,000, sugar cane for syrup \$865,000, sugar cane for sugar \$9,822,000, cotton \$4,626,000 and peanuts \$6,077,000.

Manufacturing and Business.—The net personal income paid to the people of Florida in 1954 was \$5,312,847,000. The value of retail sales in the year was \$4,014,417,000. The value of wholesale trade was \$3,402,000,000. The Selected Service trades receipts in 1954 was \$652,661,000.

(A. N. P.)

Mineral Production.—Table III shows the tonnage and value of Florida minerals in 1953 and 1954 whose value was \$100,000 or more. In 1954 Florida continued to be first among the states in output of phosphate rock and was first in zircon, second in peat output and third in ilmenite. It ranked 26th in the value of its mineral output in 1954, with 0.77% of the U.S. total.

ENCYCLOPEDIA BRITANNICA FILMS.—*Florida* (1955); *Southeastern States*, 2nd ed. (1956).

Flour: see BAKING INDUSTRY; WHEAT.

Flowers: see HORTICULTURE.

Folsom, Marion Bayard (1893—), U.S. government official and business executive, was born on Nov. 23 at McRae, Ga. He studied at the University of Georgia, Athens, and at Harvard university and worked for the Eastman Kodak company at Rochester, N.Y., of which he became treasurer and member of the board of directors. During World War I he was an army quartermaster officer with the American Expeditionary forces. Pres. Franklin D. Roosevelt appointed Folsom a member of his advisory council on economic security (1934-35) and of the federal advisory council on social security (1937-38). During World War II he held several federal and regional advisory appointments dealing with problems of manpower and employment.

Under Pres. Dwight D. Eisenhower, Folsom became undersecretary of the treasury in 1953. Following the resignation of Oveta Culp Hobby as secretary of health, education and welfare in 1955, Eisenhower appointed him to that cabinet post, and he took office Aug. 1. He reported on April 8, 1956, that the medical expenses of 500,000 U.S. families had equalled or exceeded their total annual incomes in 1953.

Food and Drug Administration: see DRUG ADMINISTRATION, U.S.

Food Supply of the World: see AGRICULTURE.

Football. Early in 1956 the National Collegiate Athletic association and several conferences cracked down on member colleges for giving excessive financial aid to athletes or for irregularities in the recruiting of stars. Auburn, Louisville, Miami (Fla.), Mississippi college, Texas A. and M. and Kansas were among the first punished. Auburn, runner-up for the South west title in 1955, was among the hardest hit, being placed on indefinite probation by its own conference and declared ineligible for a bowl game for one year. Then the N.C.A.A. put the school on three years' probation and barred it from taking part in N.C.A.A. or invitation events for the first two years of that period. The Texas Aggies were given a trial period until May 14, 1957, and ruled ineligible to compete in any events approved by the N.C.A.A. In addition, North Carolina State college was sus-

Table I.—Principal Crops of Florida

Crop	Indicated 1956	1955	Average 1945-54
Corn, bu.	12,180,000	11,840,000	8,369,000
Oats, bu.	832,000	768,000	603,000
Hay, tons	185,000	156,000	86,000
Tobacco, lb.	5,080,000	5,343,000	4,196,000
Cotton, bales	20,000	24,700	—
Potatoes, Irish, cwt.	3,899,000	3,776,000	2,783,000
Potatoes, sweet, cwt.	138,000	165,000	211,000
Peanuts, lb.	61,600,000	61,500,000	58,656,000
Sugar cane, short tons	1,092,000	1,197,000	1,210,000
Oranges, boxes	95,000,000	91,000,000	67,650,000
Tangerines, boxes	5,200,000	4,700,000	4,660,000
Grapefruit, boxes	35,000,000	38,300,000	32,690,000

Source: U.S. Department of Agriculture.

Table II.—Principal Industries of Florida

	All employees 1954	Salaries and wages 1954 (in 000)	Value added by manu- facture 1954 (in 000)	Value added by manu- facture 1953 (in 000)
Food and kindred products	29,939	\$90,504	\$205,801	\$204,440
Tobacco manufactures	8,958	20,790	34,066	33,696
Lumber and wood products	15,850	35,356	54,855	—
Paper and allied products	12,091	49,113	140,139	120,282
Printing and publishing industries	9,254	35,809	60,664	—
Chemical products	9,523	34,089	81,614	—
Stone, clay and glass products	5,227	15,975	36,535	—
Fabricated metal products	7,086	25,759	52,160	41,582

Source: U.S. Department of Commerce, 1954 Census of Manufactures, preliminary report (Washington, June 1956).

Table III.—Mineral Production of Florida

(In short tons, except as noted)

	Quantity 1953	Value 1953	Quantity 1954*	Value 1954*
Total		\$92,336,000		\$106,510,000†
Clays	258,000	2,952,000	372,000	3,337,000
Peat	28,000	186,000	37,000	168,000
Petroleum (bbl.)	543,000	—	548	—
Phosphate rock	1,045,000	56,525,000	11,690,000	64,500,000
Sand and gravel	3,731,000	3,199,000	3,469,000	2,661,000
Stone	9,429,000	11,309,000	14,225,000	16,832,000
Titanium concentrate:				
Ilmenite	151,000	2,322,000	157,000	2,412,000
Rutile	6,000	703,000	7,000	870,000
Zirconium concentrate	21,000	794,000	18,000	820,000
Other minerals	—	14,346,000	—	13,861,000

*Preliminary. †Total has been adjusted to eliminate duplication in the value of clays and stone. ‡Value included with other minerals.

Source: U.S. Bureau of Mines.

suspended for four years from taking part in any N.C.A.A. championship competition, bowl contest or participating in a televised event.

The reform movement struck the Western conference in April when Commissioner Kenneth L. ("Tug") Wilson announced that Ohio State had been placed on probation for one year and barred from Rose Bowl football for the same length of time for violation of Big Ten rules regarding aid to athletes. The Buckeyes had represented the Big Ten in the Rose Bowl on Jan. 1, 1955.

In May the Pacific Coast conference started house cleaning, Washington and U.C.L.A. being the first affected. Investigating the much-publicized "under the table" payoffs to athletes and prospective players, the conference banned Washington from all postseason sports for two years and denied the Huskies any share in the conference's Rose Bowl profits, a fine equivalent to about \$53,000. Athletes who had received aid from any non-union fide groups were ruled ineligible. The conference handed down the most severe penalty in its history on May 19 when it suspended U.C.L.A. for three years. It fined the university its share of bowl receipts and an additional \$15,000, estimated around \$95,000 in all. Guilty players lost a year's eligibility, but later this ban was eased allowing seniors to play in five consecutive games. On May 22 the conference assessed fines on eight of its nine members, Washington State being given a clean slate. Then, on July 8, Southern California was hit, being fined the equivalent of \$63,400 and banned from bowl games for two years. California drew a \$25,000 penalty and was put on probation until July 1, 1957. The N.C.A.A., in its November sessions, also punished California (one-year probation from Nov. 13, 1956); Southern California (two-year probation, during the first of which it would not be eligible to enter athletes in N.C.A.A. championships and events sanctioned by that body); and Ohio State (reaffirming the action taken by the Big Ten).

Roundup of the 1955 Collegiate Season.—Oklahoma, after gaining recognition as the leading team of the campaign, added to its reputation with a convincing 20-6 victory over Maryland, which had won ten straight games, in the Miami (Fla.) Orange Bowl on Jan. 2, 1956. On the same day the Rose Bowl battle at Pasadena, Calif., resulted in one of the wildest finishes in history when Michigan State toppled U.C.L.A., the Pacific conference

champion, 17-14. Ohio State had won the Western conference championship, but having played at Pasadena the year before was ineligible for the trip and Michigan State was chosen.

Georgia Tech capitalized on a pass interference penalty against Bobby Grier, Pitt star, to turn back the Panthers, 7-0, in the New Orleans Sugar Bowl. Mississippi came from behind to upset Texas Christian, 14-13, in the Cotton Bowl, and Vanderbilt upset Auburn, 25-13, in the Gator Bowl. Results of other bowl contests were: Wyoming 21, Texas Tech 14 (Sun); Border All-Stars 13, Skyline All-Stars 10 (Salad); Prairie View 59, Fisk 0 (Prairie View); U.S. air force All-Stars 33, U.S. army 14 (Rice). The East set back the West, 29-6, in the annual Shrine benefit contest at San Francisco on Dec. 31, and the South conquered the North, 20-7, in the renewal of their annual all-star game at Miami, Fla. The South also halted the North, 20-19, in the traditional Blue-Gray contest.

1956 College Campaign.—Oklahoma, sweeping through its third season without a loss or a tie, was ranked as the nation's no. 1 team for the second straight year, and, having won the honours three times, it retired the O'Donnell trophy, symbol of inter-collegiate supremacy. Bud Wilkinson's Sooners won 10 games to run their streak through 40 straight, an all-time record.

Yale, losing only to Colgate, 14-6, in a nonleague encounter, took the championship in the first official season of the Ivy league and also won the Big Three crown. Iowa captured the Big Ten title as Michigan ran a close second. Other group champions of 1956 included the following: Pacific, Oregon State; Big Seven, Oklahoma; Missouri Valley, Houston; Southwest, Texas A. and M.; Border, Texas Western; Skyline, Wyoming; Rocky Mountain, Montana State; Yankee, Connecticut; Southern, West Virginia; Atlantic, Clemson; Southeastern, Tennessee; Mid-American, Bowling Green; Midwest, St. Olaf and Carleton (tie); Midwestern, Tennessee State; Little Three, Williams; National Negro Championship, Tennessee A. and I. Paul Hornung, quarterback of Notre Dame, which had its worst season in history, was named to receive the Heisman trophy and won a place on several All-America teams, as did Jerry Tubbs, centre, and Tommy Mc-

RICK CASARES (35) at the start of a 68-yd. touchdown run in the second quarter of the championship game of the Western division of the National Football league, Dec. 16, 1956. Casares totalled 190 yd. rushing as the Chicago Bears defeated the Detroit Lions, 38-21



Donald, back, of Oklahoma; Ron Kramer, Michigan end; and Jim Parker, Ohio State guard. Tubbs was voted the college line-man of the year. The Maxwell trophy went to Oklahoma's McDonald. Syracuse won the Lambert trophy as unofficial eastern champion.

The campaign held its usual number of upsets, Pitt providing one of the biggest surprises on the last day of the regular campaign when it checked previously unbeaten Miami of Florida, 14-7, at Miami. Penn State proved a spoiler on two occasions, halting Ohio State, 7-6, and tying Pitt, 7-7. Syracuse set back Army, 7-0, at Syracuse as 40,053, a record football crowd for central New York, looked on. Illinois accounted for one of the Big Ten's major upsets when it beat Michigan State, 20-13, on Oct. 27, to end a 13-game unbeaten streak for the Spartans. The Western conference again set the pace in attendance with crowds of more than 80,000 at many contests. A gathering of 101,000 saw Michigan State shut out Michigan, 9-0, on Oct. 6, and Ohio State routed Stanford, 32-20, the same day before 82,881. A crowd of 93,101 saw Michigan overpower Army, 48-14, and 84,639 persons were on hand as Minnesota surprised Michigan, 20-7. In the east, a crowd of 68,000 at New Haven, Conn., saw Yale rout Princeton, 42-20, toppling the Tigers from the unbeaten ranks. The 57th Army-Navy contest at Municipal stadium in Philadelphia on Dec. 1 drew a crowd of 102,000 that saw favoured Navy rally to gain a 7-7 deadlock in a hard-fought defensive struggle.

Professional Football.—The National Football league, with attendance of 2,722,683 for 72 games, established a new mark for the circuit during the 1955 campaign. The Cleveland Browns captured Eastern conference laurels and the Los Angeles Rams triumphed in the Western division. A record play-off crowd of 87,695 at Los Angeles on Dec. 26 saw the Browns rout the Rams, 38-14. The 1956 campaign bid fair to surpass the previous one in attendance. As the regular season drew to a close the greatly improved New York Giants won the Eastern title, and the Detroit Lions were overwhelmed 38-21 by the Chicago Bears, Dec. 16, 1956, in a game which decided the Western championship. The Giants moved the site of their home games from the Polo Grounds to Yankee stadium prior to the start of the season. Lou Groza kicked four field goals as the Cleveland Browns beat the College All-Stars, 26-0, at Soldier field in Chicago Aug. 10. A crowd of 75,000 saw the contest. A team of Hawaii All-Stars, led by Y. A. Tittle of San Francisco's Forty-niners, beat a team of college all-stars, 51-20, in the Hula Bowl at Honolulu on Jan. 8, 1956. The East subdued the West, 31-30, in the Pro Bowl game at Los Angeles, Jan. 15.

Canadian Football.—The Edmonton Eskimos won the Grey cup for the third straight season by defeating the Montreal Alouettes, 50-27, at Toronto on Nov. 24, 1956. Edmonton gained a place in the play-off by routing the Saskatchewan Rough Riders, 51-7, in the Western division final. Montreal advanced by conquering Hamilton in their play-offs. The West defeated the East, 35-0, in the second annual Shrine benefit contest at Vancouver, B.C., on Dec. 8. The Canadian Rugby union made one important change in rules, raising the value of a touchdown from 5 to 6 points.

(See SOCCER.)

(T. V. H.)

ENCYCLOPEDIA BRITANNICA FILMS.—*Ball Handling in Football* (1946); *Blocking in Football* (1946); *Rock of Notre Dame* (1956); *Tackling in Football* (1946).

Ford Foundation: see SOCIETIES AND ASSOCIATIONS, U.S.

Foreign Aid Programs, U.S. United States foreign aid in the fiscal year ended June 30, 1956, came to \$4,600,000,000 net. The slight increase over the previous year's aid reversed the trend of several years.

The rise was entirely attributable to increased military aid, which came to a little more than \$3,000,000,000, compared with about \$2,500,000,000 the year before. Nonmilitary aid fell from nearly \$2,000,000,000 to \$1,600,000,000, the lowest for any year since the end of the war. Sales of surplus agricultural products, which are not included in these figures, rose from \$379,000,000 in fiscal 1955 to \$809,000,000 in fiscal 1956.

Composition of Aid.—Tables I and II show the composition of the aid given in fiscal 1956. Military aid accounted for about two-thirds of the total. The share of western Europe continued to fall as it had during recent years, but it remained the largest part of military aid. Asia, Africa and the near east continued to rise in importance, receiving \$1,300,000,000 in nonmilitary aid more than four-fifths of the total (compared with half the year before). Aid to Latin America, military and other, declined.

These figures show net aid; that is, grants and credits provided by the United States government minus repayment of principal on past loans and reverse grants (from foreign governments to the United States). As the next to last line on Table I shows, the latter were minor. Repayment of past loans, however, had become a matter of some importance in the 11th year of postwar aid programs. Table I shows net credits as negative because foreign governments repaid the United States about \$400,000,000 more on past loans than the United States advanced in current credits during fiscal 1956. New credits, advanced under aid programs, came to \$472,000,000. Of this, \$344,000,000 went to Asia, Africa and Australasia, which in the same period repaid \$100,000,000 on past loans. Latin America received \$87,000,000 in new credits but repaid \$129,000,000 of old loans. Western Europe received \$41,000,000 in new loans but repaid \$263,000,000 on past loans. Thus the net figure conceals important geographical differences and reduces the apparent volume of transactions.

Other aid, as shown in these tables, includes several kinds of aid, of which three are most important. Defense support aid given to countries that also receive military aid, to enable the economies to support an enlarged defensive effort. Some of the



"MASSIVE RETALIATION," a 1956 cartoon by Pratt of the McClatchy newspapers

is aid directly related to the maintenance of troops, but much of it goes into the general economy (for instance, raw materials and transport and industrial equipment). Development aid is given to countries that do not receive military aid from the United States. Much of it is essentially of the same character as the defense support given to other countries. The third category, technical assistance, goes to both kinds of country either directly or through the United Nations. It is distinguished from other aid primarily by the fact that it usually pays for training, advice and the transmission of techniques rather than the shipment of goods. Some supplies and equipment, however, are classified as technical assistance when shipped in connection with such programs. Relief and emergency shipments and payment of ocean freight on private contributions are among the other forms of aid in the nonmilitary category.

Military aid includes both goods and services, such as the training of foreign troops. Some of the military equipment is drawn from the stocks of the U.S. armed forces. These items are likely to be replaced in the U.S. inventories by somewhat more advanced models which cost more. In the past, the foreign aid account was charged for the replacement value. Thus, to some extent, as the senate foreign relations committee pointed out, the military assistance program has subsidized the procurement program of the Army, Navy, and Air Force." It introduced certain changes in the Mutual Security act of 1956 (covering the program for fiscal 1957) intended to eliminate much of this. Military assistance also includes offshore purchases; that is,



STEAM POWER PLANT opened at Masan, Korea, in 1956, one of three to be built with U.S. foreign aid funds. The plant consists of two 25,000 kw. generators

United States payment for production and purchase of military equipment produced outside the United States and supplied to countries participating in the Mutual Security program. Sometimes these are for items produced in the country receiving the aid and sometimes for items produced in third countries. In fiscal 1956 deliveries of offshore purchases totalled \$600,000,000. These came largely from past contracts, and the letting of new ones was relatively small.

Surplus Farm Products.—Sales of surplus agricultural products in fiscal 1956 exceeded \$800,000,000 and were more than double those of the year before. For the most part these are sold for local currencies which may be used by the United States government for some of its own expenses in that country, for grants or loans to the country in question, or for purchase of goods shipped to third countries. Until the money is used in one of the last two ways the transaction is not classified as aid, but in the meantime the receiving country has the benefit of an increase of resources with no strain on its foreign exchange supplies. Hence certain aid accounts include these shipments. Table III shows the amount of surplus farm products sold, the use of the proceeds for aid and the net change of U.S. government holdings of foreign currencies as a result of transactions under this program in each fiscal year. The largest takers of these products during fiscal 1956 were Yugoslavia (\$99,000,000), Spain (\$95,000,000), Japan (\$83,000,000), France (\$61,000,000) and the United Kingdom

Table I.—Foreign Grants and Credits of the United States Government, 1946–56

(Billions of dollars; fiscal years, ending June 30)

	July 1, 1945– June 30, 1956	1954	1955	1956
Total aid	56.1	5.2	4.5	4.6
Net grants	45.2	4.1	4.5	4.7
Net credits	10.9	1.1	-.02	-.04
Western Europe and dependent areas				
Total aid	35.5	3.0	2.4	2.1
Net grants	27.1	3.2	2.5	2.3
Net credits	8.4	-.2	-.1	-.2
Near East and Africa				
Total aid	5.1	.7	.6	.7
Net grants	4.4	.7	.55	.62
Net credits . . . . .	.6	.03	.07	.1
Other Asia and Pacific				
Total aid	12.0	1.2	1.3	1.7
Net grants	11.1	1.1	1.3	1.6
Net credits . . . . .	.8	.1	-.02	.1
Latin America				
Total aid	1.3	.3	.15	.07
Net grants . . . . .	.6	.1	.1	.11
Net credits . . . . .	.7	.2	.05	-.04
Other				
Total aid	2.3	.07	.08	.08
Net grants	1.9	.08	.10	.10
Net credits . . . . .	.4	-.01	-.01	-.02
Reverse grants and returns on grants	1.7	.1	.06	.08
Principal collected on loan repayment	3.9	.5	.46	.51
Grants converted into loans	2.3	1.0	—	—

Figures may not add exactly because of rounding.

Notes: The sums shown are net, i.e., grants are shown after deducting reverse grants and returns on grants; credits are shown after deducting repayment of principal but not interest.

Conversion of grants to credits, shown in the last line, is ignored in breakdown by countries.

Greece and Turkey are included in Near East. "Other" includes eastern Europe, international organizations, and unspecified sums.

Discrepancies between the figures for 1955 and those appearing in the comparable table in the previous volume of this series reflect revisions in the official figures. Data for 1956 are preliminary.

Source: U.S. Department of Commerce, Office of Business Economics, *Foreign Grants and Credits by the United States Government* (June 1956 quarter).

Table II.—Military and Economic Aid Provided by the United States Government, 1946–56

(Millions of dollars; fiscal years, ending June 30)

	1945–56	1954	1955	1956
All countries				
Military grants	17,809	3,521	2,556	3,044
Other aid	38,330	1,711	1,957	1,604
Western Europe and dependent areas				
Military grants	10,922	2,362	1,606	1,857
Other aid	24,583	623	797	220
Near East and Africa				
Military grants	2,273	382	289	386
Other aid	2,778	294	331	333
Other Asia and Pacific				
Military grants	4,176	714	598	740
Other aid	7,783	502	659	967
Latin America				
Military grants	262	45	43	38
Other aid	1,064	246	106	30

Figures may not add exactly because of rounding.

Notes: Sums are given on a net basis.

"Other aid" includes cash payments made to help other governments support their military efforts and also supplies, such as food and clothing, that went directly to troops.

Aid figures exclude short-term increases in U.S. holdings of foreign currencies until they are devoted to direct aid purposes. (See Table III.)

Discrepancies between the figures for 1955 and those appearing in the comparable table in the previous volume of this series reflect revisions in the official figures. Data for fiscal year 1956 are preliminary.

Source: U.S. Department of Commerce, Office of Business Economics, *Foreign Grants and Credits by the United States Government* (June 1956 quarter).

(\$57,000,000). Formosa, Korea, Israel and Greece each took between \$30,000,000 and \$40,000,000, and Argentina, Brazil, Egypt, Germany, Italy and Turkey took between \$20,000,000 and \$30,000,000.

Late in August the largest contract for sale of surplus farm products was signed with India. The United States agreed to provide \$305,900,000 worth of wheat, rice, cotton, tobacco and dairy products and to pay \$54,200,000 in shipping charges. Sixty-five per cent of the rupees the United States would receive would be loaned back to India for development purposes, and another 15% would be a grant to India. The remainder would be used

Table III.—United States Receipts of Foreign Currency From Sales of Surplus Agricultural Products, 1954-56

(Millions of dollars; fiscal years, ending June 30)

	1954	1955	1956
Sales	131.8	378.5	809.2
Used for aid	14.7	104.3	383.6
Increase in U.S. holdings of foreign currencies	116.6	283.8	383.9

Note: Uses of foreign exchange for expenses of the United States government, losses from exchange fluctuations, and advance payments by foreign governments are not shown but are reflected in the last line. "Aid" includes use of funds for third countries.

Source: U.S. Department of Commerce, Office of Business Economics, *Foreign Grants and Credits by the United States Government* (June 1956 quarter).

for U.S. government expenses in India, the purchase of strategic materials for shipments to the U.S., and payment for goods sent as aid to other countries.

Western Europe.—United States aid to western Europe was predominantly in the form of military assistance, which totalled nearly \$1,900,000,000 in fiscal 1956 compared with \$1,600,000,000 the year before. This figure included, in addition to assistance to individual countries, the U.S. contribution to the NATO (North Atlantic Treaty organization) "infrastructure" program, by which the cost of airfields, oil pipelines, communications and

transportation systems and certain other items were jointly financed, with the United States bearing 38% of the cost of the whole program.

Aid funds were also spent on joint development of weapon and other military supplies and on the expansion of munition production capacity.

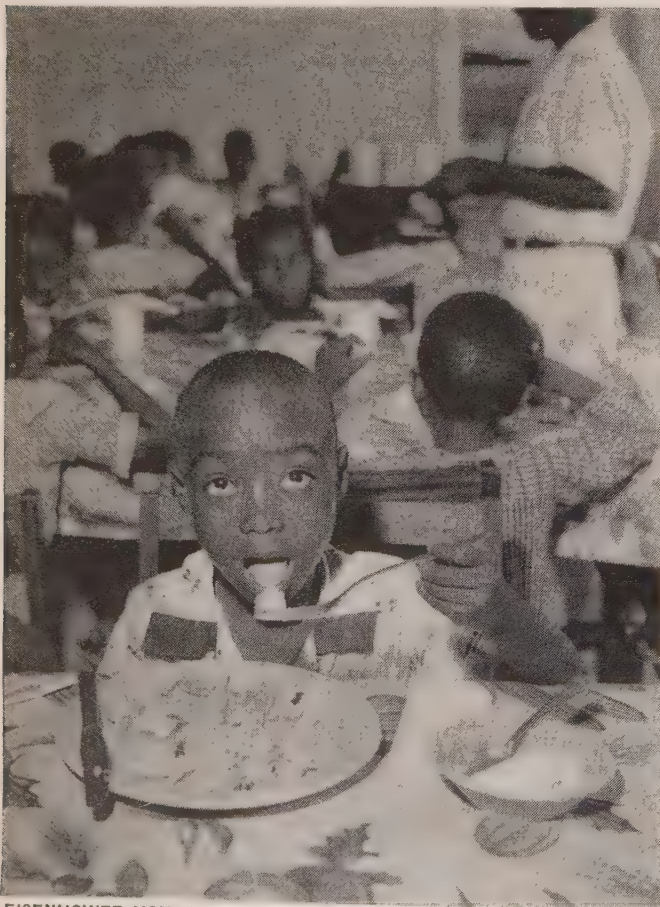
Outside the military program, net aid to western Europe came to only \$220,000,000, less than one-third what it had been the year before. Since the repayment of earlier loans exceeded this amount, the gross figure for new aid came to nearly \$500,000,000. About two-fifths of the gross aid went to France, largely to support military production and in reimbursal for earlier expenditures in the war in Indochina. The other main recipients were Spain, Yugoslavia and Italy. Aid to Spain almost doubled in fiscal 1956, while that to all other European countries declined. Food, raw materials and industrial equipment were shipped to Spain under the aid program (and there was military assistance as well). Under special arrangements, Spain was to pay for part of the cost of building air and naval bases for joint U.S. and Spanish use. Aid to Yugoslavia declined in fiscal 1956 to about the same level as to Spain (\$116,000,000, counting surplus agricultural products in both cases). There were also military shipments.

Aid to Europe in fiscal 1956 largely reflected deliveries on commitments made in earlier years. The continued decline of the area's role in the U.S. nonmilitary aid program was emphasized by the fact that of the new obligations for aid undertaken during fiscal 1956, only 7% were to Europe.

Asia and Africa.—In the far east, south Asia, the near east and Africa, military aid—\$1,100,000,000 (compared with \$887,000,000 the year before)—was less important than other forms of assistance, which totalled \$1,300,000,000 (compared with \$990,000,000 the year before). Although detailed figures are not published on the allocation of military aid, it went principally to Korea, Formosa and south Vietnam and to members of the Baghdad pact—Turkey, Iraq, Iran and Pakistan. Defense support aid to the first three of these countries accounted for nearly one-third of the nonmilitary aid given to Asia and Africa. Korea was the largest recipient (\$259,000,000), followed by Indochina—Laos and Cambodia as well as Vietnam—with \$248,000,000 and Formosa (\$105,000,000). Pakistan received \$107,000,000 in aid, a sharp rise from the \$31,000,000 of fiscal 1955. India received \$99,000,000 worth of aid, most of it in grants, compared with \$71,000,000 the year before. Turkey was the next largest recipient (\$91,000,000), followed by Japan (\$69,000,000), Greece (\$57,000,000), Israel (\$47,000,000), Iran (\$41,000,000), Thailand (\$26,000,000) and the Philippines (\$18,000,000).

In terms of new obligations undertaken during fiscal 1956 commitments to Asia, the near east and Africa accounted for 90% of defense support, 75% of the development assistance and 60% of technical assistance.

Appropriations for Fiscal 1957.—Early in 1956 the administration indicated that in the coming fiscal year aid would be roughly at the same level as in fiscal 1956. Congress was therefore surprised when the president asked for an appropriation of nearly \$5,000,000,000 compared with \$2,800,000,000 the year before. Most of the increase requested was in military aid, for which \$3,000,000,000 was asked, compared with appropriations of a little more than \$1,000,000,000 the year before. The explanation was that while the administration expected the level of aid spending to increase only slightly, the sharp cut in military appropriations for fiscal 1956 had led to depletion of the pipeline, which would mean that future military assistance would fall drastically. The desire to provide more advanced weapons to Allied countries, which cost more and took longer to produce, added to the sum.



EISENHOWER YOUNG, seven-year old second-grade student at an elementary school in Monrovia, Liberia, eating luncheon at his school cafeteria, opened in 1956 by the Joint Liberian-U.S. Technical Assistance program. The cafeteria, the first of its kind in the country, offered meals to the school children at a cost of \$0.05 each.

As in previous years, the administration's request underwent considerable whittling down through congressional action. The bill that was finally passed appropriated \$3,800,000,000 in new money and \$240,000,000 from the carry-over of unexpended funds.

The administration proposed changes in the aid legislation that would make possible long-term commitments, so that foreign countries embarking on projects that might take a number of years to complete could be assured of continuing U.S. support. It also sought to permit much greater flexibility in use of funds. On both points it had to be satisfied with much smaller changes from past practice than it had requested. There was an effort in congress to prevent any aid being given to Yugoslavia because of the apparent reconciliation between Yugoslavia and the U.S.S.R. This was defeated, but the authorization bill made further aid contingent on the president's finding (as he later did) that Yugoslavia was not under Soviet domination and that it was to the interest of the United States to provide aid to that country.

The appropriation bill stipulated that military aid to Yugoslavia provided by the new funds should consist only of maintenance and replacement parts for equipment already supplied or in the pipeline.

Proposals to amend the aid law to limit cotton goods imports into the United States were also defeated.

Continuing Debate.—Although the election campaign influenced some of the foreign aid debate, the program continued to have bipartisan support in congress and was broadly endorsed in the platforms of both major parties. Aid continued to be closely entwined with more general foreign policy measures. An offer to help Egypt build the Aswan dam was widely regarded as a step to check Soviet influence, and withdrawal of the offer played a part in precipitating the Suez crisis. After the fighting in the middle east the United States faced the possibility that western Europe would need aid for emergency oil imports. A shift in power in Poland led to the consideration of U.S. aid for that country, to help it limit Soviet influence.

Similar considerations regarding Hungary were largely dropped except for relief shipments—when the Russians crushed the rebellion there.

By the end of the year several major re-examinations of foreign aid were under way. The senate foreign relations committee had commissioned studies by universities and other organizations throughout the country as the basis for its consideration of fundamental issues. The president appointed a citizen's advisory committee under Benjamin Fairless to report to him and the public on the program. A number of private studies were also under way, generally centred on the situation created by the new Soviet activity. Underlying these studies was not only the need to devise a program for 1957 but also the feeling that basic issues needed re-examining if foreign aid was to be a continuing part of U.S. foreign policy.

(See also BUDGET, NATIONAL; INTERNATIONAL TRADE.)
(W. Dd.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Food and People* (1956); *Planning Our Foreign Policy* (problems of the middle east) (1955); *World Affairs Are Your Affairs* (1952).

Foreign Exchange: see EXCHANGE CONTROL AND EXCHANGE RATES.

Foreign Investments. Buoyed by a sustained high level of economic activity and capital movements in the United States and other industrialized countries, international capital movements reached new highs in 1956. After the middle of the year interest rates in the United States and other countries were rising sharply, reflecting the intense demand

for investment funds, but this was not expected to be a strong deterrent to foreign investments. The effects of the Suez canal crisis were not yet clear. United States investors increased their stake abroad at a record rate in 1956, and European investors were also making substantial additions to their investments in the United States and elsewhere.

U.S. Investments Abroad.—Long-term United States private foreign investments increased in value by a record \$2,200,000,000 in 1955, reaching a total value of \$26,600,000,000. The rate of investment was even higher in 1956, however, as an increase of about \$1,500,000,000 was registered in the first six months. Most of the increase was connected with direct investments, and there was also a substantial amount of new bond issues and short- and medium-term credits.

Earnings of U.S. private foreign investments totalled \$3,106,000,000 in 1955, much higher than in any previous year. Direct-investment enterprises accounted for \$2,846,000,000, equivalent to nearly 15% of all United States corporate profits after tax. In the first six months of 1956 earnings were more than 10% higher than in the previous year.

Direct Investments.—After expanding by a near-record amount of almost \$1,600,000,000 in 1955, direct foreign investments by U.S. business were sharply accelerated in 1956. Net capital outflows from the United States in the first six months of 1956 were \$619,000,000, compared with \$679,000,000 for all of 1955. The reinvestment of profits of foreign subsidiaries was a leading source of investment funds in 1955, amounting to \$868,000,000, and was probably approximately as large in 1956.

An additional source of funds for financing plant and equipment expenditures is the amounts charged against earnings for depreciation or exploration and development expenses. Although the use of funds from this source does not increase the book values of investment as measured by the department of commerce, the reports of leading companies indicated that much of their plant expansion was financed in this way. During the year the department of commerce conducted a special survey of United States companies operating in Latin America in order to develop data on actual capital expenditures, as well as collateral data such as output, employment, wages, taxes paid and sources of financing.

The petroleum industry took the lead in the rapid expansion of foreign investments in 1956, carrying out an extremely active program to develop the resources required to meet steeply rising world demand. A large number of countries were affected by this expansion. However, the direction of development by this industry could be greatly affected by the problem of the Suez canal and reaction to it in the middle east. At the beginning of 1956 nearly \$5,800,000,000 was invested in the petroleum industry abroad, including roughly \$1,000,000,000 in the middle east.

Manufacturing investments were also expanding vigorously in 1955 and 1956, totalling more than \$6,300,000,000 at the beginning of 1956, a gain of nearly \$600,000,000 over the previous year.

Direct U.S. investments in Canada rose nearly \$600,000,000 in 1955 to a total of \$6,464,000,000, and more than \$400,000,000 was added in the first six months of 1956. These massive additions to foreign investments in Canada gave rise to much discussion in Canada, especially in connection with the financing of Trans-Canada Pipe Lines, Ltd. A new study by the dominion bureau of statistics, *Canada's International Investment Position 1926-1954*, showed that in 1953 U.S. investors controlled 68% of the capital employed in petroleum in Canada, 53% of the total for mining and 39% for manufacturing. The study also showed that selected U.S. direct investment manufacturing establishments in Canada accounted for \$5,420,000,000 of factory shipments in 1953, or about 30% of the total.

A tax convention between the U.S. and Canada signed on Aug. 8, 1956, provided for a reduction in Canadian withholding taxes to 5% for companies owned 51% or more by U.S. parent companies. Previously the 5% rate applied only if the ownership was at least 95%, and the change was made largely as an inducement to U.S. companies to issue additional shares in their Canadian subsidiaries to residents of Canada.

U.S. investments in the Canadian petroleum industry continued on a large scale in 1956. The construction of the Trans-Canada pipeline to carry gas across the country was begun on the basis of an \$80,000,000 loan from the Canadian government. This loan was to be repaid by April 2, 1957, and the U.S. investors involved would then be required to provide the very large additional amounts needed to complete the line. The Westcoast Transmission Company, Ltd., organized to build a 650-mi. gas transmission line to bring Canadian gas to the U.S. border, arranged for about \$150,000,000 of financing, largely from U.S. institutional investors. Both of these projects would require large capital outflows from the U.S. in 1957.

Intensive investments to develop additional oil and gas reserves in western Canada were being carried out by many U.S. companies with considerable success. Sun Oil Co. announced the drilling of 56 wells, all of which produced oil or gas. El Paso Natural Gas company began exploration activities in British Columbia and Newmont Mining Corp. entered the Canadian oil business through Pathfinder Petroleum. An important development in 1956 was an exchange of stock between Gulf Oil Corp. and British American Oil Co. by which Gulf Oil acquired a major interest in British American, while British American acquired the large crude oil reserves of Gulf's Canadian subsidiary, Canadian Gulf Oil. In other branches of the petroleum industry, Imperial Oil Ltd. announced plans to build a \$25,000,000 petrochemical plant at Sarnia, Ont., and to expand its Montreal refinery.

Mining investments in Canada were also important in 1956, although much of the activity was still in the exploratory stage. Canadian iron ore resources remained a centre of interest: Steep Rock Iron Mines, Ltd., planned to spend an additional \$25,000,000 for further expansion; W. S. Moore Iron Co. entered into an agreement to explore and develop resources in Quebec; two U.S. companies, Atlantic Iron Ore Co. and International Iron Ore, were interested in the vast project of developing the great low-grade iron deposits in the Ungava bay area; U.S. interests announced plans to reopen the Moose Mountain iron mine and achieve sizable production; Jones & Laughlin Steel corporation agreed to carry out explorations and possible development of the Quebec iron ore properties of Quebec Cobalt and Exploration, Ltd.; and a Canadian subsidiary of the United States Steel Corp. was also active in the same area. Other developments in mining included expenditures of \$15,000,000 by the American Metal Co., Ltd., to develop lead-zinc-copper properties in New Brunswick, National Gypsum company's development of a 500-ac. tract for an asbestos open pit mine and plant, and plans by Potash Company of America and others to spend \$18,000,000-\$20,000,000 to expand potash production in Saskatchewan.

U.S. manufacturing investments in Canada at the beginning of 1956 totalled \$2,834,000,000, and a great number of new projects were under way during the year. In the general field of chemicals the du Pont Co. of Canada was planning a new plant to produce hydrogen peroxide and an \$8,000,000 plant to manufacture Orlon, a Canadian affiliate of Commercial Solvents Corp. was constructing a \$22,000,000 plant to produce ammonium phosphate and nitrate fertilizers, Dow Chemical of Canada was expanding production facilities for plastics, A. M. F. Atomics (Canada) Ltd. was constructing a plant to fabricate fuel elements, a Canadian subsidiary of Jefferson Lake Sulphur Co. was to construct a

\$1,800,000 sulphur manufacturing plant, and Procter and Gamble Co. of Canada announced plans for a multimillion dollar plant for processing shortening and edible oils.

Facilities to produce pulp and paper products were also being expanded. A Canadian affiliate of Rayonier Inc. was completing a \$1,000,000 processing and drying plant, a \$750,000 plant to produce paper bags was planned by Canadian International Paper Co., a \$15,000,000 kraft pulp mill operated by a subsidiary of Crown Zellerbach Canada, Ltd., began operations, and Hinde Dauch Paper Co. was beginning a \$2,000,000 expansion program.

Following up its earlier expansion, Aluminium Ltd. announced a \$250,000,000 program for the construction of a new hydroelectric project on the Peribonka river in northern Quebec. Reynolds Metals Co. was considering a \$100,000,000 primary aluminum plant also in Quebec.

Direct U.S. investments in Latin America increased by more than \$300,000,000 in 1955 to a total of \$6,556,000,000. This represented the beginning of an upward trend in U.S. investments in the area which was accelerating in 1956. Petroleum investments were especially active in 1956, but there were also widespread new projects in manufacturing and other industries.

There was renewed interest in investing in Argentina following the overthrow of the Perón regime, although the development of the petroleum resources of the country continued to be reserved to domestic capital and there were negotiations for large U.S. government loans. Among the industrial investments were a plastics plant largely financed by Koppers International corporation, a new pharmaceuticals plant by Merck & Co., Inc., a plant to produce adhesives by Minnesota Mining & Manufacturing company, and the first output of Jeeps by the Argentine subsidiary of Kaiser Industries Corp.

Principal developments in Bolivia were the granting of a petroleum concession to Gulf Oil Corp., discussions of pipeline projects to deliver Bolivian oil to Brazil and natural gas to Chile and granting of a mining concession to South American Gold and Platinum Co.

Direct U.S. investments in Brazil, valued at \$1,107,000,000 at the beginning of 1956, continued their steady expansion. Brazil's serious power shortage would be helped by the \$200,000,000 expansion program of American & Foreign Power Co., to be financed partly by the Export-Import Bank of Washington. Industrial investments included a Willys Overland plant to produce Jeeps, new facilities by the Hyster Co. to produce materials handling equipment, a new Brazilian subsidiary of Electric Auto-Lite Co. to produce automotive parts, and a \$3,500,000 expansion by the Borden Co. for the production of basic chemicals. A New York company, Wah Chang corporation, was investing \$5,000,000 in the extraction of tungsten, and Firestone Tire and Rubber company was establishing a 3,000-ac. rubber plantation to supply its tire manufacturing plant. There was still no indication, however, that foreign capital would be sought to develop Brazil's petroleum resources.

A considerable improvement in the economic situation of Chile occurred in 1955 and 1956 as high taxes on copper production were reduced, copper prices rose sharply, the exchange rate system was greatly improved and serious efforts were being made to halt inflation. New copper investments to be carried out included \$53,000,000 by the Anaconda company to bring into production its new El Salvador mine, \$1,250,000 by the same company to expand refineries, and \$1,900,000 by Braden Copper Co. to expand flotation facilities. Also important for Chile were the plans of American & Foreign Power Co. to invest \$60,000,000 to produce additional electricity, and new investments in nitrates following legislation in April improving taxes and exchange rates for the companies. There was also a multimillion dollar investment in an acetate yarn plant to be built by an affiliate of Celanese.

ese Corp. of America. More liberal legislation to bring in foreign oil producers was being considered.

Colombia was affected by the boom in oil exploration in 1956 as International Petroleum company announced a \$25,000,000 two-year exploration program, Cities Service company announced a development contract with the government-sponsored oil company, and four concessions were granted to John W. Mecom, a Texas oilman. South American Gold & Platinum Co. acquired a sizable interest in mining properties in Colombia.

One of the most important oil discoveries of 1956 was in Costa Rica, where Union Oil company announced in September it had brought in a well producing 1,000 bbl. a day. Cuba was also the scene of an intensive oil search by many companies, and industrial investments were also important. Cuban Electric company, a subsidiary of American & Foreign Power Co., was to carry out a five-year \$147,000,000 program to double its power production, Goodyear Tire and Rubber Co. planned a \$2,500,000 expansion of its tire plant, Firestone Tire and Rubber company was to build a \$4,000,000 plant in Havana, there were several projects to increase capacity for producing paper and other products from bagasse, and Esso Standard Oil S.A. announced an expansion of its Havana refinery to cost more than \$16,000,000. The Cuban subsidiary of Freeport Sulphur Co. was to invest \$40,000,000 to exploit nickel and cobalt properties in Oriente province.

Several oil companies were preparing to explore for oil in Guatemala, although there was some confusion resulting from conflicting leases. The first investment guaranty contract by the International Cooperation administration (I.C.A.) covering Latin America was granted to a U.S. company investing in logging and lumber processing in Guatemala. A wood-treating plant in Guatemala was also to be built by the Koppers company and Robinson Lumber Co. planned a \$3,000,000 investment.

In Haiti the Reynolds Metals Co. began bauxite mining operations in July and would soon produce about 400,000 tons of bauxite annually. On the island of Jamaica and its surrounding islands a subsidiary of Stanolind Oil & Gas Co. began exploratory operations early in 1956. In Trinidad, W. R. Grace & Co. was considering the establishment of a chemical industry.

Direct U.S. investments in Mexico increased notably by \$75,000,000 in 1955 to a total of nearly \$600,000,000. Most of the increase was in manufacturing facilities, which increased by a record \$52,000,000. Among the 1956 developments were the entry of Hercules Powder Co. into the naval stores industry, new expansion plans by Pennsalt Chemicals and Montrose Chemical Co., and the opening of the first Mexican store of the F. W. Woolworth Co. in April. A number of U.S. companies were investing substantial amounts to develop Mexico's large sulphur resources, including plans by Texas Gulf Sulphur Co. to construct a Frasch process sulphur plant.

U.S. investment activity in Panamá was highlighted by plans of Panama Refining Company, Inc., to build a deep-water dock together with a petroleum refinery and petrochemical plant. In addition the Union Oil Co. of California was to begin drilling for oil and the Cataract Mining Corporation announced the acquisition of a 2,000,000-ac. oil and gas concession near the Costa Rican border.

The largest U.S. investment in Latin America is in Venezuela, where the total at the beginning of 1956 was \$1,424,000,000. About \$1,056,000,000 of this total was in the petro-

leum industry, and plans for the expansion of oil output indicated a very large increase in these investments in 1956 and for several years to come. In 1956 Venezuela began to accept bids for new development concessions. Many U.S. companies offered large amounts, and the total received by Venezuela would be several hundred million dollars. The companies were also expanding existing properties with the largest producer, Creole Petroleum Corp., planning to spend nearly \$200,000,000 in 1956. Venezuela is also rich in other minerals, including newly discovered aluminum ore which the Henry J. Kaiser interests were studying. An important industrial development was the plan of Burlington Industries, Inc., to open a textile plant at Valencia.

Encouraged by the continued production gains of the western European countries, U.S. companies increased their direct investments in that area by about \$350,000,000 in 1955 to a total of nearly \$3,000,000,000. Most of the increase was in manufacturing facilities, and the expansion of much-needed petroleum resources also required substantial investments. Interest remained high in 1956, and there was investment activity in a large number of countries.

In Belgium a newly formed company was to manufacture Mack trucks and buses, and in France California Spray-Chemical Corp. was constructing a \$1,500,000 plant to produce an agricultural fungicide. Investments in Germany were being stepped up, including a plant expansion by the German affiliate of the Perkin-Elmer Corp. manufacturing various instruments, Ford Motor company's plans to spend \$8,000,000 for expansion under an I.C.A. guaranty, and participation by an affiliate of Celanese Corp. of America in a corporation to produce plastics for the building industries. Deere & Co. announced the purchase of one of the largest manufacturers of farm machinery in Germany.

The outlook for foreign investment in Italy was clouded in late 1956 as the Italian senate pondered an oil bill which restricted the areas open to foreign companies and set sliding scales on royalties. Gulf Oil company, the most successful of the companies, was said to be considering abandoning further activity on the Italian mainland. In Sicily, however, which was not affected by the legislation, Gulf Oil announced the construction of a new pipeline and a Dutch-American firm started test drilling. Aside from the oil situation, there was some liberalization of exchange regulations affecting foreign investors in Italy, and Chas. Pfizer & Co. announced plans for a new factory to produce pharmaceuticals and agricultural feed.

There was considerable investment activity in the Netherlands, including a new Dutch subsidiary of Thew Shovel Co. to manufacture power shovels and cranes for the European market, a decision by Netherlands Ford to carry out a 16,500,000-guilder plant expansion, Caltex Petroleum Co. (Netherlands) Ltd. planned to double the area of its enterprise at Pernis, an undertaking by the Netherlands affiliate of Standard Oil Co. of New Jersey to build a new \$28,000,000 refinery, Ferro Corp. investment in a new plant to produce Fiberglas mats, and construction by Dow Chemical Co., under an I.C.A. guaranty, of a \$1,320,000 manu-

Table I.—Value of United States Investments Abroad, Jan. 1, 1955, and Jan. 1, 1956
(In billions of dollars)

Type of Investment	Jan. 1, 1955		Jan. 1, 1956						
	Total	Total	Western Europe	Western European dependencies	Other Europe	Canada	Latin-American republics	Other countries	International institutions
Total	42.2	44.9	15.0	.7	.3	10.7	9.2	5.1	3.9
Private	26.6	29.0	5.4	.7	*	10.6	8.2	3.6	.5
Long-term	24.4	26.6	4.6	.7	*	10.3	7.3	3.2	.5
Direct	17.6	19.2	3.0	.6	—	6.5	6.6	2.5	—
Foreign dollar bonds	2.7	2.6	.2	—	*	1.5	.1	.4	.5
Other securities	2.4	2.9	.6	—	—	2.2	*	.1	—
Other	1.6	1.9	.8	*	*	.3	.6	.2	—
Short-term	2.2	2.4	.7	*	*	.3	.9	.4	—
U.S. government	15.6	15.9	9.6	*	.3	*	1.0	1.5	3.4
Long-term	15.2	15.2	9.1	*	.3	*	1.0	1.3	3.4
Short-term	.4	.7	.5	*	*	*	*	.2	—

*Less than \$50,000,000.

Source: U.S. Department of Commerce, Survey of Current Business, Aug. 1956. Detail may not add to totals because of rounding.

facturing plant.

Many restrictions affected foreign investors in Spain, although Monsanto Chemical Co. announced that it had acquired an equity interest in a Spanish firm to produce polystyrene, and oil exploration was being carried out. In Turkey, an affiliate of the Caltex group was undertaking test drilling on newly acquired concessions in southern Turkey and a number of other U.S. companies were carrying out extensive explorations on the large new areas opened by the Turkish government.

U.S. direct investments in the United Kingdom were becoming an increasingly important factor in that country's domestic economy and export trade. According to new British studies, British plants in which U.S. investors had a 75% or more interest produced about \$1,540,000,000 worth of goods in 1954. At the beginning of 1956 the total investment was valued at \$1,424,000,000 and was continuing to expand at an impressive rate. By far the largest transaction in 1956 was the purchase by the Texas company of Trinidad Oil company from British owners for \$176,400,000. By this purchase the Texas company acquired producing and refining facilities in Trinidad and marketing outlets in the United Kingdom and Canada. Anglo-American Regent Oil company planned a \$70,000,000 refinery near Southampton.

Other investments in England included plans for the construction by Esso Petroleum of a butadiene plant at Fawley, an expansion plan by Monsanto, Ltd., calling for the expenditure of about \$25,000,000, a new plant by Borg-Warner Corp. to produce transmissions, a new du Pont subsidiary to manufacture chemical products, the expansion of Dresser Industries, Inc., through two British companies producing oil and gas industry equipment, a joint venture including Firestone Tire and Rubber company to produce synthetic rubber, and purchase of a British plant by Caterpillar Tractor Co. Caterpillar Tractor was also building a new plant in Glasgow, Scot., to produce for foreign markets. In Northern Ireland, Chemstrand Corp. announced plans for a \$10,000,000 plant to manufacture synthetic fibres, and California Texas Corp. together with other U.S. and foreign investors was participating in the construction of a \$34,000,000 refinery at Whitegate, Cork county.

The investment outlook in the middle east and Africa was extremely complex in 1956, with many companies undertaking or proposing sizable outlays while parts of the area were greatly disturbed by the Suez canal crisis and other developments. Investments by petroleum companies continued to be most important. Early in 1956 Continental Oil Co. was preparing to drill an exploratory well in Egypt near Alexandria, in Israel there was further investment in the area where oil was recently discovered and the government of Israel encouraged increased investment by liberalizing depletion allowances, and Kuwait Oil Co. announced discovery of a great new oil field and planned to greatly enlarge its refining facilities. Pipeline operators were negotiating with Lebanon and other countries through which the lines pass in order to reach an agreement on taxes.

An important development was the granting by Libya of large exploratory concessions to a number of the largest U.S. companies. The Texas company was planning a large-scale expansion of its distributing facilities in western Africa, and the American Metal Co. announced the opening of a \$16,800,000 copper and cobalt producing mine in Northern Rhodesia.

The far east also presented a mixed picture to foreign investors in 1956. In Australia the search for oil was continuing without any promising new discoveries, but manufacturing investments were expanding rapidly, including new enterprises by Fruehauf Trailer Co. and Yale & Towne Manufacturing Co. Burma issued a statement expressing its interest in attracting foreign investment, and Cambodia enacted a foreign investment law setting various conditions on foreign investments. The government of

Ceylon rejected a proposal by American and British interests to construct a \$35,000,000 refinery, and India was advised by a survey mission to drop its "negative and grudging attitude" toward foreign investors. Indonesia released in June the text of a bill intended to promote foreign investments, and earlier in the year Standard-Vacuum Oil Co. arranged for a \$20,000,000 refinery modernization program.

Although U.S. companies continued to invest in Japan they tended to take minority shares in joint enterprises. Typical of this development were plans of Celanese Corp. to establish a plant to produce acetate yarn in conjunction with a Japanese company, and further investments by Dorr-Oliver Inc. in a company producing ore-dressing equipment. Oil exploration began in Pakistan with concessions granted to Nelson Bunker Hunt calling for the expenditure of \$42,000,000 and to the Standard-Vacuum Oil Co. calling for expenditures of more than \$40,000,000. The government of Pakistan was a participant in both ventures.

There was considerable investment activity by U.S. companies in the Philippines in 1956. B. F. Goodrich Co. completed a \$6,000,000 plant to produce tires and Firestone Tire and Rubber company was planning a \$5,300,000 tire and tube plant. Several companies began oil explorations, including the Texas company, Standard Oil Co. of California and Standard-Vacuum Oil Co.

Other Private Investments.—Other forms of private U.S. investment abroad increased in value by about \$800,000,000 in 1955 to a total of \$9,800,000,000 at the beginning of 1956. In the first half of 1956 net capital outflows were substantially higher than in the same period of 1955, and although rising interest rates in the U.S. after midyear were a restraining influence, sizable outflows were expected to continue.

U.S. purchases of new foreign dollar bonds totalled \$184,000,000 in the first half of 1956, all being Canadian issues except about \$25,000,000 for Israel and about \$11,000,000 for Australia. Yields on new Canadian bonds were exceeding 4% by midsummer. Net U.S. purchases of foreign corporate stocks were about \$75,000,000 in the first half of 1956, of which about \$30,000,000 were of European corporations and \$44,000,000 were Canadian. The continued outflow of U.S. funds into foreign dollar bonds, and the sizable increase in short- and medium-term bank loans, reflected the relatively high interest rates prevailing in most foreign countries. The shortage of investment funds in Canada, for instance, was largely responsible for the decision of Northspan Uranium Mines, a Canadian company, to turn to the U.S. for \$70,000,000 in September to finance completion of its uranium properties.

Continued purchases of the stocks of foreign corporations reflected confidence in the future economic progress of Canada and western Europe. Purchases of European stocks were being increasingly facilitated by the widespread use of American depository receipts issued by U.S. financial institutions and by listings on leading stock exchanges.

In July a new organization, the International Finance corporation, was set up as an affiliate of the International Bank for Reconstruction and Development. The I.F.C. had 31 member countries and a subscribed capital of \$78,366,000, including more than \$30,000,000 from the U.S. The I.F.C. would make investments in the securities of private enterprises, without the guarantee of the country in which the investment was made, and would endeavour to interest private capital in participating in these ventures.

Repayments on outstanding U.S. government credits were slightly larger than disbursements in 1955, leaving the total outstanding nearly unchanged. In the first half of 1956 the rate of disbursements on long-term government loans was rising somewhat. Short-term foreign assets of the U.S. government, consist-

Table II.—Value of Foreign Assets and Investments in the United States, Jan. 1, 1955, and Jan. 1, 1956
(In billions of dollars)

		Jan. 1, 1956							
Type of Investment	Jan. 1 1955 Total	Total	Western Europe	Western European dependen- cies	Other Europe	Canada	Latin- American republics	Other countries	Inter- national institu- tions
Total	26.8	29.6	15.6	.5	.1	4.1	3.3	2.9	2.3
Long-term	10.9	12.6	8.5	.3	+	2.6	.9	.3	+
Direct	4.0	4.3	2.7	+	—	1.4	.1	+	—
Corporate stocks	5.3	6.6	4.6	.2	+	1.1	.5	.1	+
Corporate bonds* . . . . .	.2	.3	.2	+	—	+	+	+	+
Other	1.5	1.5	1.0	.1	+	.1	.2	.1	—
Short-term assets and U.S. government obligations	15.9	17.0	7.2	.2	+	1.5	2.4	2.6	2.2
Private short-term	8.5	8.5	3.4	.2	+	.7	2.0	2.1	.1
U.S. government obligations†	7.3	8.5	3.8	+	+	.8	.3	.5	2.1
Long-term	1.1	1.6	.6	+	+	.4	.3	+	.3
Short-term‡	6.2	6.9	3.2	+	+	.5	.1	.5	1.8

*Includes state and municipal obligations.

*Includes state and municipal obligations.

†Includes estimated foreign holdings of U.S. currency of \$838,000,000 on Jan. 1, 1955, and \$839,000,000 on Jan. 1, 1956, which cannot be distributed by area.

‡Less than \$50,000,000.

Source: U.S. Department of Commerce, *Survey of Current Business*, Aug. 1956. Details may not add to totals because of rounding.

ing mainly of foreign currencies and claims arising out of the disposal abroad of agricultural surpluses, rose by a net amount of \$343,000,000 in 1955 and by \$245,000,000 in the first half of 1956.

Foreign Investments in the U.S.—Foreign assets and investments in the U.S. increased by about \$2,800,000,000 in 1955, of which about \$1,100,000,000 represented gains in liquid dollar assets, nearly \$350,000,000 was long-term capital inflows, about \$130,000,000 was reinvested earnings of direct investments and about \$1,200,000,000 represented the appreciation in market values of foreign-held U.S. corporate stocks. In the first half of 1956 about \$1,500,000,000 was added to the value of foreign holdings in the U.S., of which considerably more than half was in liquid reserves.

In addition to the gains in liquid dollar reserves foreign countries were also adding to their gold reserves out of current production. Of course, the gains in monetary reserves were not evenly distributed among countries, and there had been a declining rate of increase since 1953.

Long-Term Investments.—European investors continued to buy large amounts of U.S. corporate stocks in 1955 and 1956. At the beginning of 1956 the total market value of foreign holdings was \$6,575,000,000. In the first half of 1956 net foreign purchases were at a postwar high of more than \$100,000,000. The extent to which foreigners acquired interests in U.S. business enterprises was the subject of a series of hearings by the senate internal security subcommittee. Witnesses stated that very little could be determined about the identity of the beneficial owners of securities held through U.S. or foreign nominees. During 1956 at least two European mutual funds, one German and one Swiss-Belgian, were set up to facilitate foreign purchases of U.S. stocks.

There were also larger foreign purchases of U.S. corporate bonds and some sizable loans to U.S. companies, especially to finance their foreign expansion. In April 1956 Caltex issued a \$50,000,000-fr. loan in Switzerland to finance new refineries, and in March the Standard-Vacuum Oil Co. borrowed the equivalent of \$11,800,000 in the Netherlands and Caltex borrowed the equivalent of \$10,500,000 in the same country.

Foreign direct investments in the U.S. were also on the rise in 1955 and 1956, as foreign companies sought to participate in the expansion of the U.S. economy. Among the major developments were plans by the Belgian group, Petrofina, to invest \$15,000,000 to \$20,000,000 in a U.S. company in the petroleum industry, a move by Borax Consolidated, Ltd., to consolidate its holdings in the U.S. in a new company and greatly expand its operations with U.S. financing, a joint venture by a French firm with Crane Co. and Vitro Corp. of America to produce thorium and other minerals, acquisition by Britalta Petroleum, Ltd., of Alberta of Wilshire Oil Company of Texas by an exchange of stock, U.S. expansion by Nipissing Mines Co., a Canadian company, with new properties in North Carolina and California, and purchase by Canadian interests of National Tea Co. The Bowater organization planned a new \$100,000,000 pulp mill in South Carolina, and Abitibi Power and Paper Co. of Canada was also planning a multimillion dollar U.S. expansion, while a Canadian company, Morrison Brass Corp., purchased three U.S. companies for about \$5,000,000. In addition, the Buderus Iron works of Germany announced plans to establish a large sheet-metal proc-

essing plant in the U.S., and the Japanese government decided to aid the Alaska Pulp company of Tokyo in its plans to finance a \$50,000,000 project to build a rayon pulp mill in Sitka, Alaska.

The suit by the Swiss company, I. G. Chemie (Interhandel), to recover its interest in General Aniline and Film Corp. was dismissed in United States district court and the justice department could proceed to sell the property seized during the war.

(See also EXCHANGE CONTROL AND EXCHANGE RATES; EXPORT-IMPORT BANK OF WASHINGTON; INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT; INTERNATIONAL MONETARY FUND.) (S. Pr.)

ENCYCLOPEDIA BRITANNICA FILMS.—*Planning Our Foreign Policy* (Problems of the Middle East) (1955); *World Affairs Are Your Affairs* (1952).

Foreign Loans, U.S.: see UNITED STATES: *Foreign Credits of the United States Government*.

Foreign Missions: see MISSIONS, FOREIGN (RELIGIOUS).

Foreign Trade: see INTERNATIONAL TRADE.

Forests. United States.—In 1956 a preliminary report on the findings of the Timber Resource review, a three-year study of the forest situation in the United States, was made by the forest service, U.S. department of agriculture. The forest service conducted this study with the co-operation of state forestry agencies, forest industries and other private and public organizations. Of the 647,686,000 ac. of forest land in the United States, 484,340,000 ac., or about one-fourth of the country's total land area, was classed as commercial forest land, capable of and available for growing commercial timber crops. Three-fourths of the commercial forest land was in the states east of the Great Plains, but more than two-thirds of the saw-timber volume was in the west; 80% of the saw-timber volume was softwoods, 20% hardwoods.

One-tenth of the country's standing timber was reported to be made up of cull trees. The report said that nationwide timber quality appeared to be declining. About 115,000,000 ac. of commercial forest land (one acre of every four) was poorly stocked or nonstocked, and about 50,000,000 ac. were said to need planting to be made productive within a reasonable time.

The study showed a near balance between annual saw-timber growth, 47,400,000,000 bd.ft., and annual cut, 48,800,000,000 bd.ft. Softwood cut was in excess of growth, whereas growth of hardwoods exceeded cut. Insects, diseases, fire and other destructive agencies were estimated to take an additional toll of about 13,000,000,000 bd.ft. of saw timber each year.

On public forest lands and on forests managed by the forest industries, the productivity of recently cut forests was reported to be relatively good. Poorest productivity was generally found on the cutover lands of farm and other small private forest

holdings. These small forests, however, represented 60% of the nation's commercial timberlands.

Possibilities for increasing timber growth to keep pace with the nation's growing needs, the report said, lay in improved stocking; intensified control of insects and diseases; accelerated tree planting and forest improvement measures to increase volume and improve quality; closer utilization of timber cut (about one-fourth of the timber cut was unused logging and plant residues); and improvement of forest management, especially on the small holdings.

The Agricultural act of 1956 (soil bank) included provisions for federal financial assistance to farmers for converting general cropland to conservation uses, including the planting of trees. Another act of congress authorized a middle Atlantic states forest fire protection compact, to facilitate co-operation in fire control among the states of Delaware, Maryland, New Jersey, Pennsylvania, Virginia and West Virginia.

A southern forest fire prevention conference, sponsored by the American Forestry association, the Louisiana Forestry association and a number of other industrial and conservation groups, was held in New Orleans, La., in April 1956. Several hundred southern business and civic leaders, public officials and educators met with foresters and forestry officials to assess the damage done by forest fires in the south and to consider means of reducing fire losses. Eighty-five per cent of the forest fires in the United States occurred in the southern states. Deliberate woods burning had been a special problem in rural areas; 94% of the national total of fires of incendiary cause were in the south. The conference endorsed a program of action by all agencies to reduce southern forest fire losses, estimated at about \$250,000,000 a year.

Forest tree planting by all agencies, public and private, totalled 780,839 ac. in 1955. An additional 31,749 ac. were planted for shelter belts or wind barriers. Of the area planted for forest purposes, 239,000 ac. were planted by forest industries, 52,000 by other industries, 77,000 by federal agencies, 51,000 by state and other public agencies and 261,000 by farmers and other private landowners. The 1955 total of planting by all agencies showed a slight increase, about 1,500 ac., over the 1954 figure.

The U.S. congress appropriated a total of \$91,025,129 to the forest service for research, protection and administration of the national forests and co-operative work with the states in the fiscal year 1956. On June 30, 1956, the area of the 149 national forests and related lands under administration of the forest service was 181,058,682 ac. During the fiscal year 1956 the national forests supplied a total of 6,907,000,000 bd.ft. of timber, a new record and an increase of about 600,000 bd.ft. over the 1955 cut. Receipts from the sale of timber, grazing fees and other uses of lands under forest service administration in fiscal 1956 amounted to \$114,793,000, compared with \$81,137,000 in 1955.

BIBLIOGRAPHY.—U.S. Department of Agriculture Forest Resource Report No. 10, *Indiana's Timber Economy*, No. 11, *Timber Supplies for Industry in Arkansas*; U.S.D.A. Technical Bulletin 1146, *Financial Maturity: A Guide to Profitable Timber Growing*; U.S.D.A. Miscellaneous Publication No. 721, *People and Timber*.
(C. E. R.)

Canada.—The Canadian forest industry continued to expand steadily during 1956. Probably the most significant development was the extension of the pulp and paper industry to the prairie provinces of Alberta, Saskatchewan and Manitoba. Construction of a new mill on the east slope of the Rockies in western Alberta and another pulp mill in central Saskatchewan were planned. On the west coast a large increase in pulp production was based entirely on chips produced from slabs and edgings from sawmills, material which was formerly burned or discarded. Similar developments in sawmills in the Lake St. John area in Quebec and

in New Brunswick pointed to equally intensive utilization in eastern Canadian forests.

A chair of forest biology was established during the year at the University of Toronto, faculty of forestry, with the assistance of the Abitibi Power and Paper Co., Ltd. One of Canada's leading research foresters, J. L. Farrar, was appointed to this chair.

The Canadian Forestry association, in co-operation with the Canadian chamber of commerce, the Engineering Institute of Canada and the Canadian Institute of Forestry, held a national forestry conference in Winnipeg, Man., Sept. 17-19, 1956. This educational conference was designed to call to the attention of the Canadian public the value of its forest resources and to indicate the manner in which information on renewable natural resources could be more effectively disseminated. The 1956 conference marked the 50th anniversary of the first such conference held in Canada.

Under the Canadian tree farm program, more than 300 certified forest landowners were managing 365,000 ac. of freehold under approved tree farm standards. Also during 1956 a national forest fire prevention "Smokey Bear" campaign was planned. It was to be sponsored by the Canadian Forestry association in co-operation with other national, provincial and industrial forest fire protection organizations, and assisted by the U.S. forest service and the Advertising Council of the United States.

A published report of the Newfoundland Royal Commission on Forestry was made under the chairmanship of Maj. Gen. Howard Kennedy. Virtual conclusion of studies by the New Brunswick Forest Development commission was reported, as was the conclusion of the Royal Commission on Forestry hearings in British Columbia. In Ontario the provincial government appointed a five-member Water Resources commission with extensive powers for production, maintenance and disposition of water, a factor in Ontario forestry programs. (J. L. V. C.)

Great Britain.—On May 8, 1956, a commemoration stone was unveiled by the queen to mark the completion of the planting by the Forestry commission of 1,000,000 ac. of state forests in Britain.

In private woodlands an increased government grant of £17 per acre encouraged more extensive planting, and the demands for transplants of some species exceeded the supplies available from the nurseries.

An important forestry congress was held in Oxford in July by the International Union of Forest Research Organizations. The congress was attended by 243 delegates from 42 countries. The numerous topics discussed included research on site factors, climate in relation to the growth of native and exotic species and the fluctuations in population of harmful forest insects and the problems of their control.

Other Commonwealth Countries.—In New Zealand the planting of marram grass (*Ammophila arenaria*) for the fixation of drifting sand was successfully achieved by a new type of planting machine hauled by tractor. Three rows of the grass tufts were planted simultaneously. A serious forest fire destroyed 7,600 ac. of Corsican pine plantations in Canterbury province, and sawmills were set up in the area at once to salvage the damaged timber.

In Nigeria the results of cutting evergreen climbers and creepers to reduce the shade and to induce regeneration in dense tropical forests had proved to be so successful that it was decided to extend this method of forest improvement over larger areas.

It seemed that the effect on tropical forestry of the new uses for cellulose in the form of composite wood and fibreboard might be of great importance, particularly in Malaya and in Kenya where investigations were made in the economics of the produc-

tion of fibreboard for local consumption. This might help in finding a use for some of the very large number of tree species in these countries which are unsuitable for export as timber.

In Pakistan the government issued details of a new policy laying down the requirements for large-scale afforestation and the division of land uses between forestry and agriculture. The state forests covered only 4% of the total land area.

Europe.—In Sweden the Research Institute in Forest Tree Genetics, which was established in July 1946, published the results of ten years of the breeding of pine and spruce from the seed of carefully selected trees of high quality. Valuable trees were also multiplied vegetatively, brought to early flowering and crossed with one another. The successful results obtained led to the growing of young trees of the selected strains on a large scale. Seeds and transplants from these trees were now being used to replace the natural regeneration in many forests where the existing trees were of poor quality.

In Norway a plan to establish 120 demonstration forests in different parts of the country was inaugurated with the object of showing the advantages of methodical forest management to owners of farm woodlands, and the first 20 of these demonstration forests were started during 1956.

The growing of eucalyptus timber for domestic use was the subject of a Food and Agriculture organization conference in Rome in Oct. 1955. In many countries the growth of the indigenous tree species was too slow to meet the local needs for fuel, posts and boxwood, and in the Mediterranean countries extensive planting of eucalyptus species was officially encouraged. In Germany larger experimental plantations of selected strains of eucalyptus were also planted during the year.

In the U.S.S.R. the chief developments reported were in the increased mechanization of felling by chain saws and extraction by tractors, and the use of aircraft for seed sowing was said to be on a large scale.

In Bulgaria heavy demands for timber during the past few years for building purposes and for export led to overfelling of softwoods, particularly on mountain slopes. The government announced strong measures to control future exploitation and to ensure better regeneration of new crops by selection fellings. Clear fellings in high forest were forbidden. (See also LUMBER.)

(A. H. LD.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Arteries of Life* (1948); *Conservation Road* (1947); *Forest Conservation* (1949); *The Forest Grows* (1949); *The Forest Produces* (1949); *Forest Ranger* (1954); *The Living Forest* (1950); *Look to the Land* (1954); *Seeds of Destruction* (1948); *OURS Is the Land* (1949).

Formosa. (TAIWAN). Separated from the China mainland by about 100 mi. of sea, Formosa, a semitropical island, is situated north of the Philippines and south of Japan and Okinawa. Including the Pescadores (Penghu), Formosa has an area of 13,885 sq.mi. consisting of 78 islands (64 in the Taiwan group and 14 in the Penghu group). Pop.: (1953 census) 4,438,016; (1955 est.) 9,078,000, excluding armed forces and aliens. The populations of the five municipalities, according to the 1953 census (1955 est. in parentheses) were: Taipei, the capital, 627,752 (677,159); Kaohsiung, 316,193 (341,740); Tainan, 252,493 (268,243); Taichung, 224,710 (235,584); Keelung, 174,254 (184,688).

History.—Plane clashes and artillery duels between Nationalist and communist forces near the offshore islands continued in 1956. The defense of Formosa was further strengthened with continued military and economic aid from the United States, while considerable military build-up along the Fukien coast of the mainland was reported. In the meantime, efforts by the United States to persuade Communist China to renounce force in its objective of "liberating" Formosa bore no fruit.

Peking intensified its campaign to obtain Nationalist defections. This culminated in the open invitation of June 28 by Premier Chou En-lai to the Nationalist government to send a delegation to Peking for peace negotiations. Nationalist officials denounced Chou's offer as a deliberate attempt to deceive the free world and outlined their conditions for direct negotiations, which included the abolition of the Peking government. (See also CHINA.)

United States financial and economic aid to the Nationalist government continued. The International Cooperation Administration had provided financial assistance in the amount of U.S.\$137,118,000 for the fiscal year 1955, of which U.S.\$101,265,000 was spent for defense. For the fiscal year 1956 U.S.\$72,960,000 was provided for defense and for technical co-operation. With economic aid from the United States, agricultural and industrial output in Formosa had steadily increased. However, Formosa's production remained inadequate to maintain, by itself, a viable economy and a defense establishment to meet an all-out attack from the mainland.

Measures for putting the economy of Formosa on a self-sustaining basis were carried forward. The Four-Year Plan 1953-56 set forth a series of production, investment, reconstruction and financial goals, and although these goals were not reached, encouraging results in expanding industrial and agricultural production, developing basic electric power and transportation facilities and improving rural conditions were achieved. In September a second Four-Year Plan for 1957-60 was formulated.

Important development projects launched or completed during 1956 included: the Shimen reservoir, at a total cost of NT\$662,000,000 plus U.S.\$14,800,000, which would help irrigation and increase the generation of electric power; construction of about 130 mi. of highway linking east and west Formosa through the central mountain range; completion of the Keelung port facilities expansion program; creation of a free trade zone in the island's southern port of Kaohsiung.

LOUDSPEAKER ON QUEMOY ISLAND used by the Chinese nationalists in 1956 to broadcast messages and propaganda to the communist-held mainland, a few miles away



During 1956 only one out of five mayors and one out of 16 magistrates elected were not Taiwan-born; 16 Taiwan-born persons were appointed to the provincial government council of a total of 21 members. The seventh plenary session of the Koumintang, ruling party in Formosa, which met in May, demanded government efficiency on all levels, stressed the importance of personal integrity of all public officials, and recommended that local election procedure be improved.

Education.—At the end of 1955, more than 92% of school-age children were attending school in Formosa. The total enrolment in all schools in early 1956 exceeded 1,400,000, and in the fall new grade schools were established for more than one-third of about 89,000 school-age children who had lacked educational facilities. The government decided to extend the period of free and compulsory education from 6 to 9 years, i.e. through junior high school. In early 1956 there were 14 institutions of higher learning (6 in 1949), 1,399 primary schools (1,199 in 1949), 245 secondary schools (206 in 1949), and 36 supplementary institutions. There were about 15,000 students in college.

Finance.—While the certificate rate of the Taiwan Yuan or dollar was maintained in 1956 at about NT\$15 to U.S.\$1 the rate of exchange most generally applicable was approximately NT\$24. A special rate for foreign diplomatic personnel was adjusted to NT\$34 to U.S.\$1, which was about the same as the black-market rate. In March 1956 the total note issue by the Bank of Taiwan reached NT\$1,321,000,000 (an increase of NT\$114,000,000 over April 1955) and total bank deposits were NT\$4,862,000,000 (an increase of about NT\$100,000,000 over 1955). Three budgets exist in Formosa, the central, provincial and local, and a major portion of the provincial revenue went to finance the national budget. For the fiscal year beginning July 1, 1954, the total expenditure of NT\$5,161,000,000 for the budgets of the three levels of government were: national 55.7%; provincial 18.6%; and local 25.7%. The estimated total deficit was NT\$503,000,000 or 17.5%, which was to be met largely by provincial subsidy and U.S. aid. In addition to supporting the National government, the provincial revenue was used mostly for reconstruction projects and educational and cultural developments.

Trade.—During 1956 sugar remained the most important export of Formosa, whose leading trade partners were Japan, the United States and Hong Kong. In 1955 Japan took about 60% of Formosa's exports and supplied about 64% of its imports (not counting U.S. aid imports). In early 1956 a new trade pact with Japan was concluded calling for a combined trade value of U.S.\$152,000,000 for the 12 months ending March 1957. Excluding U.S. aid arrivals, Formosa had a favorable trade balance in 1955 of U.S.\$41,801,000. The value of exports was U.S.\$133,441,000 (U.S.\$97,756,000 in 1954) while imports were valued at U.S.\$91,640,000 (U.S.\$110,217,000 in 1954). Exports and imports for the first six months of 1956 amounted to U.S.\$69,780,000 and U.S.\$61,160,000, respectively, compared with U.S.\$62,560,000 and U.S.\$42,950,000 for the same period in 1955.

Transportation and Communications.—The total length of the railway system is about 2,800 mi., approximately 2,000 mi. of which are owned and operated by the Taiwan Sugar corporation as feeder lines. The provincial railway administration operates more than 700 mi. of railway, 480 of which constitute the main and branch lines along the west coast, and in 1955 carried 74,147,802 passengers (63,220,000 in 1953) and 10,123,790 metric tons of freight (8,800,000 in 1953). Passengers carried by vehicles operated by the highway bureau and private companies in 1955 increased to 71,973,000 (59,541,000 in 1954) and 96,899,000 (80,613,000 in 1954), respectively.

Agriculture.—Because of drought, rice production in 1955 was 1,633,000 metric tons, a setback of 93,000 metric tons from 1954. The sugar crop had increased steadily since 1946. The crop unit yield for 1954-55 reached a record high of 10.49 metric tons per hectare, surpassing the former record production of 1932.

Mining and Industry.—As shown in the table, industrial rehabilitation and development were steady. In April 1956 registered factories reached 17,030, an increase of 876 plants in one year. Shortage of capital and power, lack of raw materials and inadequate transport facilities remained the principal problems.

Industrial Output in Formosa

	1946	1954	1955
Power and mineral production:			
Power (1,000 kw.hr.)	472,002	1,805,322	1,966,358
Coal (1,000 metric tons)	1,049	2,118	2,359
Crude oil (kl.)	2,539	5,460	3,571
Natural gas (1,000 cu.m.)	39,025	29,064	28,520
Manufactured products:			
Sugar (metric tons)	80,656	642,017	802,924
Chemical fertilizers (metric tons)	500(1945)	168,000	169,000
Cement (metric tons)	97,269	536,416	589,833
Machines (metric tons)	800	6,316	7,185
Gasoline (kl.)	2,810	137,097	169,297
Cotton yarn (metric tons)	410	23,012	25,232
Paper (metric tons)	2,585	29,591	33,765

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ENCYCLOPEDIA BRITANNICA FILMS.—Formosa (1955).

Forssmann, Werner T. (1904-). German surgeon. was born on Aug. 24 at Berlin. He shared the 1956 Nobel prize for medicine with André Cournand

and D. W. Richards (*qq.v.*), for his contribution to the development of cardiac catheterization. Forssmann's pioneer work on this was a self-experiment carried out in 1929. He opened an artery in his arm and inserted a long, flexible tube. When he had pushed the tube as far as the shoulder his colleagues persuaded him to stop for fear he would kill himself. When he was alone he repeated the experiment, pushing the tube until it reached the right chamber of the heart. He then walked into the X-ray department and had his chest photographed. By this daring experiment Forssmann showed the practicability of passing a radiopaque catheter into the heart for the purpose of investigating its structure and function. The method was later elaborated, and by 1956 it had become a routine procedure in cardiological departments. It provides useful information on the behaviour of the heart and circulation in a great variety of diseases and under the influence of different drugs. It is much used in the investigation of congenital abnormalities of the heart prior to surgical intervention.

Forssmann qualified in medicine at Berlin university and after World War II he acted as a consultant to various U.S. and British hospitals in west Germany. In 1956 he was practising at Bad Kreuznach in west Germany as a urological surgeon.

Foundations: see COMMUNITY TRUSTS; SOCIETIES AND ASSOCIATIONS, U.S.

Four-H Clubs. A new high in 4-H club membership was attained in the United States during 1956 when the number rose to 2,155,952, or 51,165 more than in 1955. A total of 713,442 boys and girls were enrolled for the first time. About 64% of all members came from farm homes, 22% from rural nonfarm homes and 14% from urban homes. The members were organized into nearly 89,600 clubs, guided by about 270,000 men and women, mostly parents, who served as unpaid volunteer local leaders. Nearly 88,000 older 4-H club members assisted junior leaders.

Club members completed nearly 3,563,000 individual projects in farming, homemaking, community service and other activities. The clothing project had the largest enrolment, meal planning and preparation ranked second and vegetable growing third. Livestock and field crops were also highly popular, ranking first among boys.

During the year, members gave major attention to gaining better understanding of marketing and consumer buying, finding ways to improve quality of production, farm and home development, community betterment and an expanded program of activities particularly challenging to older teen-agers. For older youth stress was placed on choosing a career, especially in agriculture, home economics or related fields.

The 4-H program is a part of the national education system of co-operative extension work in which the U.S. department of agriculture, the state land-grant colleges and the county extension share. The National Committee on Boys and Girls Club Work, Chicago, Ill., and the National 4-H Club foundation, Silver Spring, Md., helped further the program.

Any boy or girl between the ages of 10 and 21 years may join a 4-H club by agreeing to follow 4-H ideals and standards. The club slogan is "learn by doing," and the club motto, "make the best better." The term "4-H" refers to head, heart, hands and health, emphasized in the program. Character development and good citizenship are long-range goals.

Many people in distant lands learned about 4-H club work in 1956 through the international farm youth exchange sponsored by the 4-H foundation and the extension service of the U.S. department of agriculture. More than 300 rural young men and women took part in this program of family, farm and community activities in other countries. Included were 126 outbound United

States delegates representing 36 states and territories, and 180 inbound exchangees representing 44 countries. (C. M. F.)

France. A republic of western Europe, France is bounded north by the English channel, northeast by Belgium and Luxembourg, east by Germany and Switzerland, southeast by Italy, south by the Mediterranean sea, southwest by Spain and west by the Atlantic ocean. Area: 212,736 sq.mi., including the Mediterranean island of Corsica (3,367 sq.mi.), but excluding the overseas *départements* of Algeria, French Guiana, Guadeloupe, Martinique and Réunion (*qq.v.*). Pop.: (1954 census) 42,774,445; (1956 est.) 43,600,000. Language: French is almost universally spoken but there are also other regional languages and dialects: German in Alsace and part of Lorraine; Breton in Brittany; Flemish in the northern corner of the Nord *département*; Provençal in the Alpes Maritimes, Basses-Alpes, Var and Bouches-du-Rhône *départements*; Catalan in Roussillon (Pyrénées-Orientales); Basque south of Bayonne; and Italian in Corsica. Religion: mainly Roman Catholic with about 700,000 Protestants and more than 230,000 Jews. Chief towns (pop., 1954 census): Paris (cap.) 2,850,139; Marseilles 661,492; Lyons 471,170; Toulouse 268,863; Bordeaux 257,946; Nice 244,360; Nantes 222,790; Strasbourg 200,921; 16 towns with a population of from 100,000 to 200,000. President of the republic, René Coty. Prime ministers in 1956: Edgar Faure and (from Jan. 31) Guy Mollet.

History.—*The General Election.*—The year 1956 began with a general election on Jan. 2 following on a dissolution of the previous national assembly on Dec. 2, 1955. The campaign had been embittered since the Socialists and left-wing Radicals, who had themselves created the situation which permitted the dissolution, had argued that though it was constitutionally legal, it was nonetheless constitutionally improper. The previous government led by the right-wing Radical Edgar Faure had hoped that the parties of the centre and right which formed his coalition would come back at least as strong as before, and perhaps stronger. The Socialists, left-wing Radicals led by Pierre Mendès-France, the U.D.S.R. (Union démocratique et socialiste de la Résistance) and the more left-wing Gaullists formed an alliance, the Republican front, and fought the elections on the declared assumption that a non-Communist left-wing majority was possible. The electoral law in force had been devised in 1951 to give an advantage to parties forming alliances, since such an alliance gained a majority in any constituency (all multimember), took all the seats and divided them between themselves. In 1951 most constituencies parties ranging from the Socialists to the conservatives had formed such alliances to keep out the Communists and the Gaullists. But in 1956 the Gaullists had become a party accepting the regime, while the Socialist and left-wing radical voters were in no mood to see their candidates allied with the catholic M.R.P. (Mouvement Républicain Populaire) and conservatives in support of a parliamentary republic which no longer seemed threatened. A split therefore ran through the centre, although there were still Communists allied to nobody on the left, and a new right-wing antiregime party led by Pierre Poujade also allied to nobody. With four groups of parties competing for votes instead of three, there were very few constituencies in which an alliance of parties could hope for an absolute majority. The lack of one meant that the seats would be distributed proportionally between all parties that attained a necessary minimum. It was possible therefore for a party to gain votes compared with 1951 and lose seats or vice versa. Because of the disturbed state of Algeria, no elections were held there so that 30 seats remained vacant.

The results were to some degree a disappointment to all parties except the Poujadists, who obtained 12.1% of the votes and 52

seats instead of a confidently predicted dozen. They won mainly at the expense of the Gaullists whose 20.5% of the votes in metropolitan France decreased to 4.2%. Some former Gaullist supporters also went to the Conservative groups (Independents and Peasants) who increased their vote from 13.1% to 14.1% but lost 30 seats. The M.R.P.'s share of the metropolitan vote decreased from 12.3% to 10.6% and their seats from 83 to 67. Indisputably therefore the former coalition's occasional majority had become a definite minority. But the Republican front was even further from having achieved anything like a majority. Radicals of all kinds and the small allied group U.D.S.R., both of them split in their attitude to the Faure government, returned with 71 seats instead of 82, though with 13.6% instead of 11.5% of the votes. But of these Faure (expelled from the Radical party after the dissolution) led 14, while the orthodox Radicals now led by Mendès-France only numbered 34 in metropolitan France and some of these were notoriously not his enthusiastic supporters. The Socialists increased their vote (for the first time since 1946) from 14.5% in 1951 to 15%, but their metropolitan deputies dropped from 94 to 88. The Communists, having again the advantage of a proportional distribution of seats, increased their metropolitan deputies from 93 to 145, but their vote by the official calculation (which they disputed) decreased from 26.5% to 25.6%.

The Communists demanded a revival of the Popular front of 1936 (Communists, Socialists and Radicals), but neither of the other two parties considered this for a moment, all the less since in 1956, unlike 1936, the Communists were the biggest of the three parties and could have claimed the premiership. The two principal leaders of the Republican front (Guy Mollet, Socialist, Mendès-France, Radical) had meanwhile claimed the premiership. They based this claim on being the most important expression of the popular discontent with the previous government, although in fact the front had fewer deputies than remained to the old coalition. A Socialist party congress meeting on Jan. 15 rejected any alliance on the government level with either "reaction" (*i.e.*, any members of the old coalition) or with the "enemies of democracy" (*i.e.*, Communists or Poujadists). The M.R.P. wished to re-establish their claim to be the right way of the left, rather than a party of the right and would have had no objection to entering a coalition with a Socialist premier; but the Socialists were adamant. A simple calculation showed that, with the Communists and Poujadists excluded from office, there was no possible government without the Socialists.

Mollet Cabinet.—On Jan. 26 President Coty sent for Mollet as the leader of the most important non-Communist party in the opposition. Mollet formed a minority government of the Republican front parties only. On Feb. 1 he received a large but unenthusiastic majority of 420 to 71. This majority included the Communists whom Mollet had spurned in his program speech, 173 members of parties which might be considered Republican front, the M.R.P. and some Conservatives. The Communists wished to demonstrate their readiness to enter a Popular front coalition, while in the centre and on the moderate right no one wished to take the blame for there being no government at all. Mollet's program included limited social objectives (increased old-age pensions, a third week of paid holiday and some wage adjustments), renewed effort for European unification through a common market for the six powers (admittedly a distant aim) and Euratom (European Atomic community) (an immediate aim), consolidation of the Atlantic alliance, pursuance of disarmament negotiations and firm opposition to inflation and devaluation. With regard to the burning question of Algeria, the immediate task, he said, was to end both terrorism and repression so that free elections could be held with a single electoral roll. Algeria's future statute would be determined in negotiation with



NEARLY DESERTED BOULEVARD in Paris, Fr., Nov. 26, 1956, reflecting the fuel oil shortage caused by the Suez canal crisis

its elected representatives. It must prevent oppression of either Algerian community by the other, respect Algeria's individuality and strengthen the links with France.

The Mollet government's activities fell clearly into two groups: those natural to a Socialist government—social, economic, educational, colonial and "European"—and those concerned with problems which it could not evade and cannot be said to have solved—north Africa and the middle east. It was these that made the Mollet government to an increasing extent a national government in a sense which no government had been since that of Gen. Charles de Gaulle.

Home Affairs.—The government succeeded in passing into law both extension of paid holidays and the increase of the old-age pensions, to be financed in part by a 10% increase of income tax and a new tax on cars. In November an immediate expansion of credits for education was announced and, as from 1958 the creation of a fund annually fed by 58,000,000,000 fr. for the modernization and democratization of French education, so as both to replace the ancient and inadequate buildings and allow for 340,000 university students in ten years' time instead of 170,000 as at present. A beginning was made with the industrial exploitation of the immense resources of natural gas, found at Lacq in the Basses-Pyrénées. Full utilization would, however, require big capital investment.

The government's anti-inflationary battle was fought with regard to the budget and to prices. Mollet insisted on increased taxes to finance the rise in old-age pensions and only accepted a loan instead of a further tax increase to pay for the Algerian war after a long struggle. This loan aimed at bringing in 150,000,000,000 fr. in six weeks but when it was closed on Oct. 3 after only three and a half weeks it had raised 320,000,000,000 fr. The terms were however very favourable: 5% and a guarantee that the capital value would rise (but not fall) according to the increase of the average value of shares and debentures quoted on the Paris Bourse. The 1957 budget approved for presentation to the assembly on Oct. 10 showed expenditure of 4,428,000,000,000 fr. against receipts of 3,810,000,000,000 fr. in spite of 370,000,000,000 fr. for economics, mainly on civil expenditure, as compared with the estimates for the current year. Military expenditure was up 110,000,000,000 fr.

Prices were a long and bitter battle, since a very slight in-

crease of the cost-of-living index figure would automatically involve a 5% increase of the basic minimum wage. Imports were admitted in spite of an adverse balance of trade, and indirect taxes were cut in spite of the deficit. Price stabilizing machinery with severe penalties was reintroduced. Even so it was universally believed that the index figure was only kept within bounds by statistical juggling.

Foreign Affairs.—Mollet's "European" policy made substantial progress. The essential precondition—elimination of outstanding disputes with Germany—was achieved after seven months' negotiation. The Luxembourg agreement (Oct. 27) wound up the Saar dispute. (See SAAR.) Mollet persuaded the assembly to approve in principle the plan for a European Atomic community (Euratom) on July 12 by 332 votes to 181 with 70 abstentions. Divergencies between France and Germany on this scheme and on the approach to the common market had been almost entirely smoothed out by the time of Konrad Adenauer's visit to Paris on Nov. 6, but this achievement attracted little attention in view of the middle east crisis.

As far as France was concerned this was organically connected with North Africa. The Mollet government's attitude to the Algerian rebellion was marked by insistence from the start on elections based on a single college of electors (*i.e.*, giving Moslems their natural majority), but also by a rejection of the Faure government's idea of a round table conference to be held immediately in the hope of ending the rebellion. France would negotiate only with Algeria's elected representatives. But even if the rebellion could be repressed, how were free elections to be held for a long period after it? Gradually the right, especially in Algeria, discovered that Mollet's approaches offered fewer dangers from their point of view than Faure's. On Feb. 28 Mollet appealed to the rebels to lay down their arms since France was now offering them free elections. This had no effect at all. hitherto the elections of the Moslem college of voters had been far from free and at all events the rebels wanted to control their own elections.

Meanwhile Robert Lacoste, the governor general, was urgently demanding 200,000 reinforcements. They could only be provided by calling up reservists, an unpleasant decision for men elected in the hope that they would end the war. The government had also to renew by law the special powers needed by the Algerian authorities, since the dissolution had automatically annulled the enabling act of the previous year. This again was an unpleasant duty for a Socialist government. The law finally passed the upper house on March 16.

On April 10, after six weeks' hesitation, the government called up reservists. By the end of June there were more than 400,000 soldiers in Algeria and more than 500,000 in North Africa. Lacoste could claim that areas controlled by rebel bands in Algeria had been gradually reduced, but the rebellion cropped up in new areas when it was put down in some of its original strongholds. Above all the government's critics noted that the gulf between the two communities, European and Moslem, was growing. The failure to seek a negotiation showed its price when relatively moderate leaders like Ferhat Abbas joined the F.L.N. (Front de Libération Nationale) in Cairo in April. (See also ALGERIA.)

Gen. Gamal Abdel Nasser's nationalization of the Suez canal came as a justification for all those Frenchmen who had claimed that tough action against him was necessary for the pacification of Algeria. The assembly adopted on July 21 by 422 to 150 (*i.e.*, by all except Communists) a resolution calling Nasser's action an act of violence and a violation of his commitments, and declared that by his explicit intention to establish a hegemony in the Arab world he was a "permanent threat to the peace." It called upon the government not to accept the *fait accompli* but to take the most energetic measures. It also called for the solidar-

ity of France's allies.

Relations with Tunisia and Morocco meanwhile were becoming increasingly difficult. France's attitude to Egypt created an additional complication, though neither of the governments went beyond verbal sympathy with Egypt. Both were increasingly interested in an Algerian settlement, and an idea for a North African federation of the three territories in close relation to France was taking shape. Sultan Mohammed V ben Yusuf's moderate speech of Sept. 25 at Oudjda, thanking the French for a liberal attitude to Morocco and Tunisia and urging the possibility of agreement in Algeria, brought no result though there were increasing numbers of Frenchmen both inside and outside the government who thought that use should be made of the sultan's good offices. Two incidents strengthened those who urged that France should remain firm until order was restored and elections could be held in Algeria.

On Oct. 18 a small ship, the "Athos," carrying 70 tons of arms was intercepted near the western extremity of the Algerian coast. It had been loaded by Egyptian soldiers in uniform in the naval port of Alexandria and was apparently to have landed the arms on the Moroccan coast so that they could be smuggled into Algeria. Here was undeniable evidence of Egyptian backing to the rebellion.

On Oct. 20 the sultan publicly received in his palace five of the principal Algerian rebel leaders, namely Mohammed ben Bella, Mohammed Khider, Ait Ahmed Hocine, Mustafa Lacheraf and Mohammed Boudiaf. They had been brought in his son's aircraft from Tetuán. It was announced that they would accompany the sultan to Tunis on Oct. 22 so that the meeting between him and the bey would become symbolic of a union of all the Maghreb (Occident). (See also TUNISIA.)

Franco-Moroccan relations had again worsened because of difficulties over troop movements, and there had been overt assistance to rebels on the Tunisian side of the border. The situation was ripe for "firmness." The French government decided to suspend all negotiations with the Moroccan government on Oct. 22. On the same day the French pilot of an aircraft belonging to the Moroccan State Air Transport company was induced to land the five Algerian rebel leaders at Algiers, where they were arrested. There was jubilation in France when the news was first received. It immediately provoked a grave crisis in French relations with both Tunisia and Morocco, both of whom withdrew their ambassadors. The French ambassador in Tunis resigned. By chance the post was vacant at Rabat. Seventy-one French colonists, including women and children, were massacred in the Meknes area and an exodus of Frenchmen from Morocco began. (See also MOROCCO.)

The "fruitlessness" of the two Suez conferences in London had been admitted by Mollet in a speech on Sept. 24 but he declared France's purpose was unchanged. On Oct. 16 Christian Pineau, the foreign minister, declared that nothing had yet been settled and it was too soon to judge the outcome.

The Israeli invasion of Egypt, therefore, struck a France that had been frustrated of expected action for three months but encouraged to remain expectant. Mollet's announcement to the assembly of the Franco-British ultimatum to Egypt and Israel on Oct. 30 was endorsed by 368 to 188 (Communists and Poujadists) and 11 abstentions (including Mendès-France). There was no further debate on the issue for more than three weeks though there was an impassioned debate on Soviet action in Hungary. In the press criticism of the principle of French policy was much less prominent than that of execution, especially as the allied offensive took nearly a week to develop and the cease-fire was called before the objectives had been reached. French opinion was dismayed. Daniel Meyer, a Socialist leader, spoke of "British duplicity" and *Le Monde* complained of "Puritan morality" of



SNOW ON THE RIVIERA, a rare sight, as France and other nations of western Europe suffered a severe cold wave in Feb. 1956. The photograph was taken on the Promenade des Anglais, Nice

British opposition to Sir Anthony Eden.

The Communist monopoly of opposition did not have the effect that might have been expected because everything said by them was disconnected when the party took the side of the U.S.S.R. in Hungary. No other party had challenged the government's attitude from July onward and critics were therefore hampered in challenging it at this late stage.

(See also FRENCH EQUATORIAL AFRICA; FRENCH LITERATURE; NORTH ATLANTIC TREATY ORGANIZATION; PARIS; UNITED NATIONS.)

(D. R. GL.)

ENCYCLOPÆDIA BRITANNICA FILMS.—France (1955); *France and Its People* (1955); *Vacances En Normandie* (1956).

Education.—Schools (1954–55): primary 85,392 (including 4,422 kindergarten), pupils 6,248,000 (including 675,000 kindergarten), teachers (1953–54) 201,061; secondary (1953–54, including some primary classes): state 898, pupils (1954–55) 530,626, teachers 21,423; private (1953–54) 1,624, pupils 372,974, teachers 18,148; state vocational schools (1953–54) 1,064, pupils 282,897, teachers 19,035; state teacher training (1953–54) 162, students 16,868. Institutions of higher education (1953–54): state 53, students 15,806; private (including vocational) 40, students 8,136. Universities (1955) 17, students 155,803, teachers (1953–54) 3,600.

Finance.—Monetary unit: franc, with an official exchange rate of 350 fr. = U.S. \$1. Budget: (1955 actual) revenue 3,553,000,000,000 fr., expenditure 3,956,000,000,000 fr.; (1956 revised est.) revenue 3,373,000,000,000 fr., expenditure 3,959,000,000,000 fr.; (1957 est.) revenue 3,713,000,000,000 fr., expenditure 4,900,000,000,000 fr. Internal debt (Oct. 1955) 4,775,000,000,000 fr.; external debt 1,052,000,000,000 fr. Currency circulation (Dec. 1955) 2,853,000,000,000 fr., (Dec. 1954) 2,551,000,000,000 fr. Deposit money: (Dec. 1955) 3,139,000,000,000 fr., (Dec. 1954) 2,715,000,000,000 fr. Gold and foreign exchange, official (March 1955) U.S. \$1,535,000,000, (March 1956) U.S. \$1,969,000,000.

Foreign Trade.—(1955) Imports 1,640,852,000,000 fr.; exports 1,679,272,000,000 fr. Main sources of imports: continental E.P.U. (European Payments Union countries) dependencies 26%; continental E.P.U. 27%; U.S. and Canada 11%; U.K. 4%; other sterling area 19%; Latin America 4%. Main destinations of exports: continental E.P.U. dependencies 36%; continental E.P.U. 36%; U.K. 7%; other sterling area 4%; Latin America 5%; U.S. and Canada 5%.

Transport and Communications.—State railways (1954) 41,200 km., including 4,421 km. electrified; passenger-km. (1955) 27,780,000,000; freight, ton-km. (1955) 46,896,000,000. Roads (1953) 830,000 km. Motor vehicles in use (1954): passenger 2,520,000, commercial 1,222,000. Navigable inland waterways (1953) 8,500 km. Shipping (July 1955): merchant vessels of 100 gross tons and over 1,220; gross tonnage 3,922,478. Civil aviation (1955) 3,195,180,000 passenger-km.; freight 106,824,000 ton-km. Telephones (Jan. 1955) 2,945,564. Licensed radio receivers (1955) 9,044,000.

Agriculture.—Main crops (metric tons, 1955; 1954 in parentheses): wheat 10,379,000 (10,566,000); rye 439,000 (514,000); barley 2,665,000 (2,525,000); oats 3,580,000 (3,574,000); maize 910,000 (955,000); broad beans 78,000 (77,000); dry beans 105,000 (99,000); rice 90,000 (50,000); potatoes 15,458,000 (16,986,000); flax fibre 43,900 (34,200); tobacco 51,000 (56,900); olives 5,000 (1953) 8,000; dessert grapes (1954) 234,000. Livestock (Sept. 1955): cattle 17,322,000; sheep 8,013,000; horses 2,215,000; pigs 7,570,000; chickens (1954) 75,000,000. Food production (metric tons, 1955): beef and veal 1,410,000; pork 920,000; mut-

ton and lamb 115,000; milk (1954) 18,600,000; butter (1954) 305,000; cheese 350,000; olive oil 8,000; beet sugar, raw value 1,631,000; wine 56,720,000 hl., (1954) 58,490,000 hl. Fish landed (1954, including Algeria) 442,000 metric tons.

Industry.—Fuel and power (1955): electricity 49,560,000,000 kw.h.w.; manufactured gas 2,497,000,000 cu.m.; coke 10,079,000 metric tons; coal 55,332,000 metric tons; crude oil 874,800 metric tons. Production (metric tons, 1955): iron ore (35% metal content) 50,321,000; bauxite 1,497,000; pig iron 10,959,000; crude steel 12,348,000; zinc 137,400; aluminum 161,000; copper 27,400; tin 9,300; cement 10,764,000; cotton yarn 265,200; cotton fabrics 193,000; wool yarn 129,000; wool fabrics 70,000; rayon filament yarn 54,840; rayon staple fibre 55,200; sulphuric acid 1,472,000; superphosphates 1,073,000; passenger vehicles 553,320; commercial vehicles 171,720. Petroleum treated in refineries 25,086,000 metric tons. Merchant shipping launched (100 gross tons and over, 1955) 325,200 gross tons. Index of production (Jan. 1956; 1953 = 100) 132.

Franklin Institute: see SOCIETIES AND ASSOCIATIONS, U.S.

Freemasonry: see SOCIETIES AND ASSOCIATIONS, U.S.

Freer Gallery of Art: see SMITHSONIAN INSTITUTION.

French Colonial Empire: see FRENCH UNION.

French Equatorial Africa. This federation in central Africa of four overseas territories of the French Union is bounded west by the Atlantic ocean, Nigeria and French West Africa, north by Libya, east by Sudan and southeast by the Belgian Congo. Cameroun, under French trusteeship, is administered separately. Areas and populations are:

Territory	Area (sq.mi.)	Population		Capital
		1950 census	(1955 est.)	
Gabon	103,089	408,778	392,000	Libreville
Middle Congo	132,046	684,450	698,000	Pointe Noire
Ubangi-Shari	238,224	1,071,791	1,063,000	Bangui
Chad	495,752	2,241,501	2,384,000	Fort Lamy
Total	969,111	4,406,520	4,537,000	
Cameroun	166,793	3,077,080*	3,116,000	Yaoundé

*1951 census.

Population: mainly Negro, but there are semi-Hamitic, semi-Negroid pastoralists in the northern savannah districts; European (1950) 20,120 in A.E.F. (Afrique Équatoriale Française), 12,249 (mostly French) in the Cameroun (1951). Religion: animism; 1,600,000 Moslems (in Chad they represent 46% of the population); about 280,000 Christians in Gabon and Middle Congo and 300,000 in the southern Cameroun. Chief towns: Brazzaville (cap. of A.E.F.) pop. (1950 census) 84,090; Bangui 41,800; Fort Lamy 23,200; Libreville 10,100; Douala (Cameroun, 1955 est.) 110,000; Yaoundé 36,000. High commissioner in A.E.F. in 1956, Gov. Gen. Paul Chauvet. Governors: Gabon, Yves Digo; Middle Congo, Ernest Rouys; Ubangi-Shari, Louis Sanmarco; Chad, Ignace Colombani. High commissioner in Cameroun, Pierre Messmer.

History.—Little change resulted from the elections to the French National assembly, held on June 2, 1956. In the Cameroun, Louis Aujoulat, a former minister, was defeated in his candidature. At Brazzaville disorders broke out between the supporters of the three candidates for election, who represented different racial groups.

In addition to the manganese at Franceville, deposits of potash and iron ore were discovered; and petroleum was discovered at Pointe-Clairette, near Fort-Gentil. The export of timber and of cotton was further developed. The township of Djoué, near Brazzaville, was handed over by France to the World Health organization.

In April, Pierre Messmer was appointed high commissioner in the Cameroun. The economic and political situation confronting him was difficult. The fall in the price of cacao, from 123 fr. per kilogram to 47, had hit the country hard, and a maintenance fund had to be set up, with aid from metropolitan France. In the south, where the effect of the fall in price of cacao was severely felt, political agitation broke out: Soppo Priso, president of the territorial assembly, founded a new party, the Union Nationale Camerounaise (U.N.C.), and announced that the "skeleton law"

voted by the French parliament was inadequate. In August the government decided to dissolve the assembly, to declare an amnesty and to proceed to elections for a new assembly. A movement opposed to the U.N.C. was started by the parliamentary representatives of the northern Cameroun. (Hu. De.)

Education.—Schools: A.E.F. (Afrique Équatoriale Française) (1954): primary 959, pupils 129,718; secondary 35, pupils 5,728; vocational 130, pupils 5,162. Cameroun (1954-55): primary 1,865, pupils 216,161, teachers 4,561; secondary 26, pupils 3,690, teachers 156; technical schools 16, pupils 966.

Foreign Trade.—(1955) Monetary unit: 1 franc C. F. A. (Colonies Françaises d'Afrique) = 2 metropolitan francs. U.S. \$1 = 350 metropolitan francs. Note circulation: A.E.F.: 7,000,000,000 fr. C. F. A.; Cameroun: 6,000,000,000 fr. C. F. A. A.E.F.: imports 18,000,000,000 fr. C. F. A., including 10,000,000,000 fr. C. F. A. from France; exports 13,000,000,000 fr. C. F. A., including 8,000,000,000 fr. C. F. A. to France. Cameroun: imports 18,000,000,000 fr. C. F. A., including 11,000,000,000 fr. C. F. A. from France; exports 16,000,000,000 fr. C. F. A., including 8,000,000,000 fr. C. F. A. to France, 3,000,000,000 fr. C. F. A. to the Netherlands. Principal exports: A.E.F.: cotton 5,000,000,000 fr. C. F. A., sisal 5,000,000,000 fr. C. F. A.; Cameroun: cocoa 6,000,000 fr. C. F. A., coffee 2,000,000,000 fr. C. F. A.

French Guiana. This overseas *département* on the north-east coast of South America has an area, including the territory of Inini of 35,135 sq.mi. and a population (1946 census) of 28,506; (1954 census) 27,863, including 1,059 natives of Inini. The coastal lowland population is Negro or mixed; Europeans about 5%; Inini, aboriginal Indians. Religion: mainly Roman Catholic. Capital and chief port, Cayenne, pop. (1954 est.) 11,458. Prefect in 1956, Pierre Malvy.

History.—Edouard Galmont, of the Social Republican party (formerly Gaullist), was re-elected as deputy on Jan. 2, 1956.

In Paris, Fr., negotiations began between France and Brazil to determine the frontier between Brazil and French Guiana.

On Aug. 10 Gen. Charles de Gaulle paid a short visit to Cayenne. (Hu. De.)

Foreign Trade.—(1955) Monetary unit: metropolitan franc, valued at 350 francs to U.S. \$1. Budget included in that of France. Imports 2,900,000,000 fr., including 2,000,000,000 fr. from France. Exports 300,000,000 fr. Principal exports: rum 150,000,000 fr., gold 100,000,000 fr.

French Guinea: see FRENCH WEST AFRICA.

French Literature. Literary production in France in 1956 was abundant and varied and many good novels came to view, but among the diversity of talents there was no dominant author. The tendency to describe life in its sombre colours and to depict intense, agonized people who were convinced of the absurdity of existence continued to show itself, particularly among the young authors.

Following his great work *Hommes de bonne volonté*, Jules Romains published *Le Fils de Jerphanion*, the bitter reflections on a new generation of unbalanced men who had lost all hope. This book, awaited with curiosity, was far from being the success of its predecessors. Henri de Montherlant wrote a new extract from *La Rose de sable* under the title *Les Auligny*. After his remarkable biographies of the previous year on George Sand and Hugo, André Maurois returned to the novel with *Les Roses de septembre*. Pierre Benoît in *Fabrice* evoked the drama of the German occupation. With *La Chute* Albert Camus wrote his grimmest book on human distress. From his side Blaise Cendrars gave free rein to his violence and leaning toward obscenity in *Emmène moi au bout du monde*. The new academician André Chamson published a penetrating study of the disordered imagination of a lonely invalid girl under the title *Adeline Venician*. Simone's last book with the strange title *Québéfi* (a condensation of *Quelle belle fille*) described a friendship between a man and an animal.

Among the books by known authors who had already produced important work the following must be mentioned: *Le Malfaiteur* by Julien Green; *Roi d'un jour* by Alexandre Arnoux; *Matinales* by Jacques Chardonne; *Tout est à vendre* by Roland



FRANÇOISE SAGAN, author of *A Certain Smile*, published in the U.S. in 1956 by E. P. Dutton & Co.

Dorgelès; *Colères* by Vercors; *Jeunes proies* by Roger Peyrefitte; *Charmante* by André Beucler; *Présence des morts* by Emmanuel Berl (a meditation on the dead who return, particularly on his friend Drieu La Rochelle); *Passion* by Jean Schlumberger; *La grive* by Henri Troyat (the third volume of the trilogy, *Les semailles et les moissons*); and *Les Flammes de l'été* by Jules Roy.

Outstanding among the new generation was the startling success of the young novelist Françoise Sagan who, having conquered the critics and public with *Bonjour tristesse*, wrote *Un certain sourire*, which was one of the best sellers of 1956. Among the other talented women who held attention were Liliana Magrini (*Carnet Venitien*); Sorana Aurian (*Récit d'un combat*, the reflections of a woman consumed with cancer, who lucidly observes the progress of the disease); and Célia Bertin (*Haute couture, terre inconnue*). It was interesting also to note that a lately forsaken style of novel (the brief and dramatic recital) returned to fashion. Many miscellanies appeared in 1956: *La Folle amoureuse* by Paul Morand; *Cordélia* by Françoise Mallet-Joris; *La Blessure* by Pierre Moinot; *Dieu vous garde des femmes* by Michel de Saint-Pierre; and *Le Chemin de L'étoile* by Alexandre Arnoux. Other novels of note were: *Antoine mon frère* by Jacques de Bourbon-Busset; *Les Demoiselles de Flanville* by Marc Blancpain; *Les taxis de la Marne* by Jean Dutourd (a vehement protestation against the national defeat); *Vous verrez le ciel ouvert* by Gilbert Cesbron; *Le Rendez vous de Quimper* by Robert Bourget-Pailleron; *C'est tout-à-fait moi* by Jean-Jacques Gautier; *Place des angoisses* (a new study of the medical set in Lyon) by Jean Reverzy; and *Le Chien et la pierre* by Lucien Psichari (grandson of Anatole France).

Among the poets, several names deserve notice: Cécile Perin (*Regards vers l'ombre*); Jean Mogin (*Pâtures du silence*); Jean-Pierre Rosnay (*Comme un bateau prend la mer*). The first volume of the complete works of the surrealist poet Antonin Artaud was published and also many studies on Mallarmé: *Mallarmé vivant* by Robert Goffin; *L'Oeuvre poétique de Stéphane Mallarmé* by Émilie Noulet; and *Les Clefs de Mallarmé* by Charles Chassé. Also a *Traduction en vers des Bucoliques de Virgile* was written by Paul Valéry.

Notable memoirs and recollections of literary men included *Journal littéraire* (vol. 3) and *Lettres à ma mère* by Paul Léautaud; *L'Âge de fer* (1925–1955) by Fernand Gregh; *Mémoires* by Romain Rolland (from infancy to the Dreyfus affair); *Souvenirs sans fin* (vol. 2) by André Salmon; *Près de Colette* by her husband Maurice Goudekot, and, for their great literary merit, the *Mémoires de guerre* by Charles de Gaulle (vol. 2, *L'Unité* from 1942 to 1944).

Literary history was represented by several interesting works: *Une amitié amoureuse: Mme. de Stael et Mme. Récamier* by Maurice Levaillant; *Monsieur de Vigny, homme d'ordre et poète* by Henri Guillemin; *Maurice Barres et le Quartier Latin* by Henri Mondor; *La Jeunesse d'André Gide* by Jean Delay and *Madeleine et André Gide* by Jean Schlumberger; *L'Époque contemporaine* (the period 1905–1930) by André Billy.

(See also CANADIAN LITERATURE; LITERARY PRIZES.)

(A. PR.)

French Overseas Territories: see FRENCH UNION.

French Pacific Islands: see PACIFIC ISLANDS, FRENCH.

French Union. With the establishment, by the constitution of 1946, of the French union, in which are comprised both the mother country and the former empire, the old colonial terminology was abolished and for the colonies were substituted four categories of overseas regions. The older assimilated colonies claimed recognition as French *départements* administered as in the mother country; the others became overseas territories (*territoires d'outre-mer*) which henceforward would elect representatives to parliament and would have their own local assemblies possessed of wide powers; the trust territories, to be known in future as *territoires associés*, were similar in structure to the overseas territories and had the same electoral privileges; lastly, there were the former protectorates, now styled *états associés*, which could belong to the union only by an act of voluntary accession. Total area of the French union, excluding France proper (1955 est.): 4,217,546 sq.mi.; total population about 43,386,000. Certain essential information on the component parts of the French union is given in the table. (See also separate articles.)

History.—Elections in the overseas territories, to fill 42 seats in the French national assembly, resulted in gains for the R.D.A. or African Democratic Rally (who won 8 seats instead of 2) and losses for the Overseas Independents (9 seats instead of 14); the Socialists and the Gaullists lost 2 seats each. In general, local parties gained at the expense of metropolitan parties. In the Guy Mollet government (Jan. 31), Félix Houphouët-Boigny, the Negro deputy of the Ivory Coast, was appointed minister of state; a Socialist, Gaston Defferre, minister for Overseas France; and another Socialist, Alain Savary, secretary of state for Moroccan and Tunisian affairs. The new title of minister resident in Algeria was substituted for that of governor general when Gen. Georges Catroux was appointed to that office. On Feb. 6, Robert Lacoste, a Socialist, who had previously been minister of finance, took Catroux's place.

Algerian affairs were a grave concern to the cabinet. The insurrection of the *jellaghas*, directed by the Committee of National Liberation, spread to assume serious proportions, and the Moslems most favourably disposed to France began to adopt an attitude of reserve or even of hostility. The European community in Algeria showed itself intransigent, and received Mollet's visit to Algiers with hostile demonstrations (Feb. 6). Mollet declared that France was "unshakably resolved" to remain in Algeria and at the same time to promote the country's political development; recognizing Algerian individuality, he stated that the reign of violence must cease and free elections take place before the

French Union

Country and area, sq.mi. (approx.)	Population* (000's omitted)	Capital, status, governors, rulers, etc.	Country and area sq.mi. (approx.)	Population* (000's omitted)	Capital, status, governors, rulers, etc.
AFRICA					
Algeria, 846,124	9,529†	Algiers, group of 12 départements, Minister resident: Robert Lacoste.	AFRICA (Continued)		
French West Africa, 1,831,079	17,676	Dakar, group of eight territories, High commissioner: Gaston Cusin.	French Somaliland, 8,494	64	Jibuti, overseas territory, Governor: Roland Petitbon.
Mauritania, 416,061	567	Saint-Louis, overseas territory, Governor: Jean Paul Parisot.	Madagascar, and Dependencies 230,165	4,740	Antananarivo, overseas territory, Governor general: André Soucadaux.
Senegal, 80,617	2,108	Saint-Louis, overseas territory, Governor: Jean Colombani.	Comoro archipelago, 832	170	Dzaoudzi, overseas territory, Administrator: Pierre Couder.
Sudan, 460,540	3,467	Bamako, overseas territory, Governor: Lucien Geay.	Réunion, 969	274†	Saint-Denis, overseas département, Prefect: Perreau Pradier.
Upper Volta, 105,946	3,137	Ouagadougou, overseas territory, Governor: Salvador Etcheber.	AMERICA		
Niger, 494,633	2,181	Niamey, overseas territory, Governor: Jean Ramadier.	Saint-Pierre and Miquelon, 93	5	Saint-Pierre, overseas territory, Administrator: Pierre Sicaud.
Ivory Coast, 123,282	2,309	Abidjan, overseas territory, Governor: vacant.	French Guiana, 35,135	28†	Cayenne, overseas département, Prefect: Pierre Malvy.
French Guinea, 106,216	2,261	Conakry, overseas territory, Governor: Charles Henri Bonfils.	Guadeloupe, 687	229†	Basse-Terre, overseas département, Prefect: Guy Malines.
Dahomey, 43,784	1,565	Porto Novo, overseas territory, Governor: Pierre Biros.	Martinique, 425	239†	Fort-de-France, overseas département, Prefect: Gaston Villéger.
Togoland, 21,235	1,070	Lomé, trust territory, Commissioner: Jean Louis Bérard.	ASIA		
French Equatorial Africa, 969,111	4,537	Brazzaville, group of four territories, High commissioner: Paul Chauvet.	Laos, 91,506	1,425	Vientiane, associate state, King: Sisavang Vong; Premier: Souvanna Phuma.
Gabon, 103,089	392	Libreville, overseas territory, Governor: Yves Jean Digo.	OCEANIA		
Middle Congo, 132,046	698	Pointe Noire, overseas territory, Governor: Ernest Rouys.	New Caledonia and dependencies, 7,654	65†	Nouméa, overseas territory, Commissioner general for the Pacific Islands: Aimé Grimald.
Ubangi Shari, 238,224	1,063	Bangui, overseas territory, Governor: Louis Sanmarco.	New Hebrides, 5,700	53	Vila, Franco-British condominium, French Resident: Pierre Anthionoz.
Chad, 495,752	2,384	Fort Lamy, overseas territory, Governor: Ignace Colombani.	French Pacific Islands, 1,544	63†	Papeete, overseas territory, Governor: Jean Toby.
Cameroun, 166,793	3,116	Yaoundé, trust territory, High commissioner: Pierre Mesmer.			

*1955 estimate if not otherwise stated. †1954 est. ‡1951 est.

future of Algeria could be determined. Lacoste was given full powers in civil administration, and considerable armed forces were put at his disposal. The insurgents then changed their tactics to those of terrorism. In Paris itself Algerian students and workers raised the flag of the *fellaghas* in political demonstrations.

The independence of Tunisia and of Morocco was recognized in bilateral agreements terminating the two protectorate treaties.

For the tropical overseas territories, Defferre and Houphouet drafted a "skeleton law" which was passed by 477 votes against 99 (the Right wing) on March 22. This established the single-college electoral system and extended the function of the ter-

ritorial assemblies, empowering them to appoint government councils to assist the governors. Houphouet declared: "A federal organization must be our aim, though at present it would be merely idealistic to construct at once a federation on paper between a highly developed metropolis and territories that have barely come into being . . . I do not see nationalism as the sovereign remedy for Negro Africa in the 20th century, when interdependence has become the golden rule."

Meanwhile decrees were issued to ensure the entry of considerable numbers of Africans into the higher grades of the services and into the National School for Overseas France, which trains administrative staff.

By a law of Aug. 24 Togo was offered a new constitution as an

AFRICAN CHIEFS attending the opening of the new palace of the assembly of the French union, inaugurated in Paris, July 12, 1956





"THE OVERLY APT STUDENT," another 1956 cartoon by Yardley of the *Baltimore Sun* (Md.)

autonomous republic. The inhabitants were to make their will known through a referendum. The United Nations' Trusteeship Council refused to send observers. In the Cameroun elections for a new assembly were envisaged on the single-college system. Amnesties were declared with regard to acts of rebellion in the Cameroun and in Madagascar.

Tunisian and Moroccan independence and Southern Vietnam's withdrawal from the assembly of the French union, together with the transformation of the overseas territories and the new proposals for Algeria, caused article viii of the constitution of the union to lapse. Work was begun on the revision of the constitution.

(See also ALGERIA; CAMBODIA; FRANCE; LAOS; MOROCCO; TUNISIA; VIETNAM.) (HU. DE.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Mediterranean Africa* (1952); *Backward Civilization* (The Berbers of Northern Africa) (1937).

French West Africa. This group of eight West African overseas territories of the French Union is bounded west and south by the Atlantic ocean, north by Río de Oro, southern Algeria and Libya, and east by Chad and Nigeria. The eastern part of the former German colony of Togo, under French trusteeship, is administered separately. Areas and populations are shown in the table.

Population: mainly Negro; some Arab and Berber admixture in the savanna; European (1951) 62,236 (including 49,458 met-

Territory	Area (sq. mi.)	Population (1951 census)†	(1955 est.)	Capital
Mauritania	416,061	546,400	567,000	Saint-Louis
Senegal	80,617	2,092,800	2,108,000	Saint-Louis
Gambia	460,540	3,444,900	3,467,000	Bamako
Upper Volta*	105,946	3,116,200	3,137,000	Ouagadougou
Niger	494,633	2,164,900	2,181,000	Niamey
Ivory Coast	123,282	2,169,600	2,390,000	Abidjan
French Guinea	106,216	2,256,900	2,261,000	Conakry
Dahomey	43,784	1,570,000	1,565,000	Porto Novo
Togo	1,831,079	17,361,700	17,676,000	Lomé
Togoland	21,235	998,660‡	1,070,000	

*Territory of Upper Volta was formed on Jan. 4, 1947, from parts of Sudan, Ivory Coast and Niger. †Census of non-natives only; estimate of natives. ‡1950 est.

ropolitan French) in A.O.F. (Afrique Occidentale Française), 1,427 (1952) in Togoland. Religion: animist 53.4%; Moslem 44.2%; Christian 2.4%. Chief towns (pop., 1951 census): Dakar (cap. of A.O.F.) 229,200; Abidjan 81,000; Bamako 97,900; Saint-Louis 60,000; Conakry 35,600; Ouagadougou 37,300; Porto Novo 28,400; Lomé (1953 est.) 35,000. High commissioner in A.O.F. in 1956, Gov. Gen. Gaston Cusin. Governors: Mauritania, Jean Paul Parisot; Senegal, Jean Colombani; Sudan, Lucien Geay; Upper Volta, Salvador Etcheber; Niger, Jean Ramadier; Ivory Coast, *vacant*; French Guinea, Charles Henri Bonfils; Dahomey, Pierre Biros. Commissioner in Togoland, Jean Louis Bérard.

History.—Elections to the French national assembly held on Jan. 2, 1956, returned most of the previous deputies to their seats. The Rassemblement Démocratique Africain (R.D.A.) registered gains, and its leader, Félix Houphouët-Boigny (deputy for the Ivory Coast), became minister of state in the Guy Mollet government. Houphouët declared that his party sought to impose an ideal of fraternity in the place of the ideal of independence, which he regarded as negative; and that he had confidence in the "radiant future" of the French union. Meanwhile the Bloc Démocratique Sénégalais (B.D.S.) under the leadership of the former minister Leopold Senghor, called for a "common front of the forces of Africa" and for the opening of the way toward a "French federal republic." The trade unions for the most part favoured autonomy. An unsuccessful attempt was made to regroup the Senegalese parties.

In Cairo, Egy., the Maghreb office set up a Mauritanian department with the collaboration of the former deputy Hormaould-Babana, who demanded the incorporation of Mauritania with Morocco.

In French Guinea the scheme for building a dam on the Konkouré was adopted. The association of Guinea chiefs decided to recognize tenants as owners of the land that they held and to revise the customary law of the country.

Gaston Cusin, inspector general of national economy, was appointed high commissioner in French West Africa on July 6, in succession to Bernard Cornut-Gentile, who had been appointed to an ambassadorial post.

A law of Aug. 26, drafted after debate in the Togo territorial assembly, offered Togo a new constitution; it was to be an autonomous republic represented in the French parliament. France was to be represented by a high commissioner in Togo and to be responsible for the country's defense and foreign relations. A Togo legislative assembly was to pass the laws of the country, its members being elected by direct universal suffrage every five years. The high commissioner was to designate the prime minister, who would be invested by the assembly and would appoint the other members of the government. The new constitution was to be the subject of a referendum. (HU. DE.)

Education.—Schools (1955): A.O.F. (Afrique Occidentale Française): primary 1,708, pupils 268,200; secondary 71, pupils 12,125; vocational 112, pupils 5,284; teachers' training colleges 28, students 2,830. Higher education: Institut des Hautes Études at Dakar, students 362. Teachers, all schools 7,588. Togo (1954): classes: primary 965, pupils 52,697; secondary 48, pupils 1,138. Teachers, all schools 1,025.

Foreign Trade.—(1955) Monetary unit: 1 franc C. F. A. (Colonies Françaises d'Afrique) = 2 metropolitan francs; 350 metropolitan francs = U.S. \$1. Note circulation 37,000,000,000 fr. C. F. A. A.O.F.: imports 67,000,000,000 fr. C. F. A., including 43,000,000,000 fr. C. F. A. from France; exports 52,000,000,000 fr. C. F. A., including 32,000,000,000 fr. C. F. A. to France. Togo: imports 3,000,000,000 fr. C. F. A., including 1,300,000,000 fr. C. F. A. from France; exports 3,800,000,000 fr. C. F. A., including 1,700,000,000 to France. Principal exports: A.O.F.: coffee 13,000,000,000 fr. C. F. A., cocoa 11,000,000,000 fr. C. F. A., peanuts 7,000,000,000 fr. C. F. A., palm oil 7,000,000,000 fr. C. F. A.; Togo: cocoa 2,000,000,000 fr. C. F. A.

Friends, Religious Society of. Friends (also called Quakers) numbered slightly more than 188,000 in 1956, mostly located in North America and Great Britain. During 1956 four events in the world

of Quakerism illustrated the involvement of Quakers in typical social situations.

The American Friends Service committee had two development projects in the near east, one in Israel, the other at Amman, Jordan. On Jan. 7, 1956, the project at Amman was attacked and completely destroyed by a group of Jordan Arabs, apparently moved by the general anti-western feeling in Jordan rather than by animosity toward the Quakers alone. The service committee gave up its work in Jordan until conditions might become more stable.

In April, Philadelphia Yearly Meeting sent three Friends as its representatives to Montgomery, Ala., then in the early stages of a boycott by Negroes against the city's bus lines. The purpose of the visit, which made contacts with both the Negro and white communities, was to commend the use of nonviolent methods in the dispute and, as the delegation stated, "to give support and encouragement to the creative potentialities we believe exist in both groups toward bringing about a solution which does not compromise basic human dignity."

A two-member subcommittee of the Un-American Activities committee of the U.S. house of representatives, investigating the Fund for the Republic, held a hearing in Philadelphia during July. In connection with the fund's grant of \$5,000 to Plymouth Monthly Meeting of Friends, Plymouth Meeting, Pa., for the meeting's refusal to discharge its librarian who was under attack in the community for refusing to sign the state loyalty oath and for alleged former membership in a Communist organization, some members of the meeting were subpoenaed to appear at the hearing. Nine prominent Philadelphia Friends, in an open letter to the house committee, protested the investigation as unwarranted interference with the internal affairs of a religious organization.

Six American Friends who had paid a visit to the Soviet Union in 1955 published a report of their journey in the spring of 1956. The *Saturday Review* reprinted a part of the report in its issue of Sept. 8, 1956, calling it "one of the most searching and valuable documents on the nature and meaning of Communist power that has yet appeared."

(See also CHURCH MEMBERSHIP.)

(I.Y. W. R.)

Frozen Foods. Retail sales of frozen foods in 1956 were indicated as fully 10% above the \$2,000,000,-000 volume of 1955, with about 25,000,000 of the country's 43,000,000 families buying frozen foods regularly. Quantities approached 5,000,000,000 lb. More than 270,000 grocery stores, about 70% of the total, doing more than 90% of all grocery sales volume, had frozen food cabinets. Prepared frozen foods, which increased by 67% in 1955 over 1954 to 425,000,000 lb., made further gains in 1956. Installation of frozen food cabinets in army messes in the continental U.S. and overseas widened the market.

Included in the 1956 pack were considerably more frozen vegetables than the 1,100,000,000 lb. packed in 1955; peas, potato products and green and wax beans were the leading items. Straw-

berries and cherries comprised about 60% of the fruit pack. Stocks of frozen fruits and vegetables in September were at all-time record highs; turkeys and total frozen poultry in September were at record levels for the month. Frozen strawberries reached a new postharvest high of 244,000,000 lb.

A study by the Wisconsin Alumni Research foundation of 5 frozen food items with respect to eight vitamins, six mineral and seven other components was reported favourable to their quality. An attempt was announced by a U.S. businessman to establish a frozen food industry in Italy. (J. K. R.)

Fruit. Total United States production of deciduous fruit in 1956 was slightly below both 1955 and the average for the previous decade. Peaches, pears, grapes and plums were about average; prunes were below average and apples down by one-tenth. The dried fruit pack was larger than in 1955. Canned fruits were ample.

Citrus prospects were generally favourable after an early summer drought was broken in some important areas. Exports continued at a high level. Production of frozen orange concentrate set a new record in 1955-56, and a further increase appeared likely in 1956-57.

Fruit crops of western Europe were reduced by the winter freeze and still further damage to quality and amount of harvest resulted from August storms. About 20,000,000 boxes of oranges were lost in Spain as a result of the freeze in Feb. 1956.

Ireland increased its duty on fresh and canned fruit to 37½% ad valorem. Norway put lemons and grapefruit from dollar area on the duty free list. France set a quota of 250,000 boxes of fresh citrus imports, but increased the apple and pear quota to 1,000,000 boxes. South Africa and Australia continued their upward trend in the production of canned fruit, with 2,900,000 cases produced in South Africa in 1955 and 3,500,000 cases in Australia, of which 2,100,000 cases and 5,000,000 cases respectively were exported, mostly to the British market. South African dried fruit production in 1956 was substantially lower than in 1955.

Cuba exported a record 33,000 crates (40 lb. each) of fresh mangoes to the United States. Increased amounts of pears, plums and grapes were exported from Argentina to the U.S.

Apples.—The 1956 commercial apple crop of the U.S. was estimated at 96,145,000 bu., 9% smaller than 1955 and 8% below the average for the previous decade. Colouring, sizing and general quality were favourable. Average price to producers in October was \$2.59 per bushel, higher than \$2.25 per bushel a year earlier. Exports of 2,042,000 bu. in 1955-56 were 8% larger than for 1954-55, and imports of 1,571,000 bu. were 44% larger.

Production of principal countries in the northern hemisphere was indicated at 378,821,000 bu. (excluding cider apples) as compared with 336,850,000 bu. in 1955 and 288,727,000 bu. average for 1945-49. Canadian production, afflicted generally with weather disabilities, was 11,614,000 bu. as compared with 19,142,000 bu. in 1955. The European crop, in spite of a rough winter, was the largest in several years, 405,063,000 bu. (including cider) or 271,271,000 bu. of "dessert" apples as compared with 357,476,000 bu. and 208,902,000 bu. respectively in 1955.

Storage Holdings of Some Freezer Commodities, U.S.

Commodity	1956*	1955*	Average 1951-55*
Fruits	490,059	470,439	391,807
Juices			
Orange	281,646	218,140	183,246
Other	122,295	107,148	79,228
Vegetables	874,717	672,574	620,972
Cream	18,248	17,181	25,002
Creamery butter	91,346	295,043	266,312
Eggs (frozen)	151,920	147,211	135,795
Poultry	232,327	161,947	175,156
Beef	116,102	110,139	126,629
Pork	163,053	179,182	242,345
Lamb and mutton	9,456	8,683	9,187
Veal	11,024	10,747	10,973
Edible offal	44,912	54,537	51,191
Fish and shellfish	212,637	214,045	—

*As of Sept. 30.

Table I.—U.S. Commercial Apple Production, by Leading States

		(In thousands of bushels)							
State	Indicated 1956	1955	Average, 1945-54	State	Indicated 1956	1955	Average, 1945-54	State	Indicated 1956
Washington	17,300	26,100	27,523	Ohio	2,000	2,700	2,823	Idaho	1,600
New York	13,500	19,700	14,761	Indiana	1,750	850	1,372	North Carolina	1,600
Michigan	10,700	7,500	7,108	Oregon	1,670	2,350	2,655	Colorado	1,505
Virginia	10,500	5,500	8,965	Massachusetts	1,640	2,940	2,274	Wisconsin	1,190
California	9,130	9,440	8,514	Idaho	1,600	1,630	1,583	Connecticut	1,040
Pennsylvania	4,590	6,500	5,945	North Carolina	1,600	40	1,239		
West Virginia	4,050	4,346	3,832	Colorado	1,505	1,210	1,273		
New Jersey	3,000	3,000	2,432	Wisconsin	1,190	1,380	1,072		
Illinois	2,550	1,430	3,002	Connecticut	1,040	1,530	1,191		

Apricots.—An indicated U.S. crop of 193,300 tons was 31% below 1955 and 10% less than average. All major producing areas shared the decline; California with 182,000 tons as compared with 253,000 tons in 1955 continued as major producing state.

The dried apricot crop of Iran was forecast at 4,400 tons, low compared with 6,000 tons in 1955 and an average of 7,500 tons for 1949-53.

Avocados.—The 1956 Florida crop was indicated at 11,000 tons, down 23% as compared with 14,000 tons in 1955 but above the average crop (1945-54) of 5,830 tons. Cuba shipped a record 205,000 crates (38 lb. net) to the U.S. in the period June to September.

Bananas.—The U.S. continued to be the leading importer of bananas, taking approximately 65,000,000 bunches. World exports were indicated as more than the 131,489,000 bunches of 1955. Ecuador was the leading exporter with more than 26,000,000 bunches while exports from Honduras were expected to reach 12,000,000 stems of 50 lb. each.

Cherries.—U.S. production of sour cherries was 102,620 tons, 1% smaller than in 1955 and 12% below average. Michigan was the leading state with 55,000 tons, followed by New York and Wisconsin. The canned pack was less than the 3,453,000 cases of 1955 but packers' carry-over stocks on July 1 of 354,613 cases were double those of a year earlier.

The sweet cherry crop was a small one of 68,460 tons, down 2% as compared with 113,090 tons in 1955; the average crop of 1945-54 was 95,686 tons. Prices to producers averaged \$288 per ton, 33% above those received for the 1955 crop.

The 1956 Italian crop of brining cherries was $\frac{1}{4}$ less than the average 1955 crop of 11,000 tons. The 1956 French crop was about normal in spite of the freeze.

Cranberries.—U.S. production in 1956 was estimated at 958,000 bbl., 8% less than in 1955 but above average. Massachusetts accounted for about half the crop. Prices were as much as 5 cents per pound higher than in 1955.

Dates.—Continuation of a new use program to broaden the market was announced by the U.S. department of agriculture in October, with 8,000,000 lb. from the 1956 crop to be set aside for use in other than whole or pitted form, in return for a diversion payment of 4 cents per pound. About 8,600,000 lb. were diverted from the 1955 crop.

The 1956 production of the Basra area of Iraq was forecast as much as $\frac{1}{3}$ below the normal of about 110,000 tons. Prices to exporters for the 1956 crop were lowered by about $\frac{1}{3}$, that of Halab from \$50 to \$35 per ton.

Figs.—The 1956 California crop developed well; Kadotas for drying were of good size and quality. Dried production was indicated as larger than the 25,300 tons of 1955.

Foreign commercial production of dried figs in 1955 was estimated at 148,700 tons, 15% below the previous year. The 1956 Turkish dried fig pack was estimated at 38,500 tons; the Greek crop was nearly 28,000 tons, while that of Portugal was indicated at 11,000 tons.

Grapefruit.—The U.S. 1956-57 crop was forecast at nearly 3,300,000 boxes, 3% smaller than the 1955-56 crop. Florida produced about 90% of the total. Early season prices were high, averaging \$1.88 per box as compared with \$1.07 a year earlier. Exports during November to July of the 1955-56 season were 1,000,000 boxes, 24% larger than a year earlier; larger exports were indicated for 1956-57.

Production of the principal countries in 1955-56 was estimated at 51,044,000 boxes (of 80 lb. each) as compared with 47,150,000 boxes in the preceding year. Israel, second to the U.S. in production, but with only 1,464,000 boxes in 1955-56, anticipated exports of 1,000,000 cases in 1956-57.

Grapes.—The U.S. 1956 grape crop was indicated at 2,993,500 tons, 8% less than 1955 but 3% above average. Wine varieties accounted for 600,000 tons against 601,000 tons in 1955; table varieties 529,000 tons against 709,000 tons; and raisin varieties 1,600,000 tons versus 1,706,000 tons. Raisin production was estimated at 205,000 tons (dried), about 180,000 tons of them being Natural Thompson Seedless, as compared with 224,000 tons in 1955. Raisin prices in excess of 12 cents per pound were up about 1 cent as compared with 1955.

The 1956 commercial raisin crop outside the U.S. was forecast at 292,800 tons as compared with 268,500 tons in 1955 and an average of 243,500 tons for 1949-53. The Turkish crop was a record one of 91,000 tons, more than double the 44,000 tons of 1955.

Production of currants, estimated at 104,500 tons, was of average size; the Greek crop was 88,000 tons as compared with 63,000 tons in 1955.

Lemons.—The 1956-57 lemon crop of California was indicated at 13,600,000 boxes against 12,600,000 boxes the previous year. Exports in 1955-56 took 558,000 boxes.

World lemon production in principal producing countries in 1955-56 was indicated at 29,509,000 boxes (of 76 lb.) as compared with 30,909,000 boxes in the previous year and an average of 26,070,000 boxes for 1945-49. Italy, with 8,296,000 boxes was second to the U.S.

Limes.—The Florida production in 1956-57 was estimated at 380,000 boxes, as compared with 400,000 boxes in the previous year and an average crop of 261,000 boxes. Production of frozen limeade concentrate increased to 560,000 gallons, 60% more than in the previous year.

Production by Mexico, Egypt and the U.S. in 1955-56 was 4,500,000 boxes (80 lb. each). Mexico with 2,260,000 boxes accounted for half the total.

Olives.—The condition of the California olive crop indicated a crop much increased over the 39,000 tons of 1955 and above average.

Oranges.—The U.S. early and midseason orange crop of 1956-57 was estimated at 70,885,000 boxes, 4% larger than in 1955-56 and 27% above average. The prospective Florida Valencia crop for 1957 was indicated at 41,000,000 boxes, 4% larger than 1956. The average price to producers in October was \$2.34 per box as compared with \$1.67 a year earlier. Exports in 1955-56, largely moving to Canada, and under government programs to western Europe, were the equivalent of 5,900,000 boxes, 28% larger than in 1954-55.

About 350,000,000 boxes (of 70 lb. each) were produced by the principal producing countries in 1955-56, as compared with 349,396,000 boxes in 1954-55 and only 257,179,000 boxes average 1945-49. Israel anticipated an export of Jaffa oranges 10% less than the 5,500,000 cases of 1955-56. Opening prices on Navel oranges in the Valencia area of Spain were as high as \$6.30 per box.

Table II.—U.S. Orange Production by States

State	(In thousands of boxes*)			
	Indicated, 1956	1955	1954	Average, 1945-54
Florida				
Temples	3,000	2,800	2,500	1,322
Other, early and midseason	51,000	48,700	49,500	36,438
Valencias	41,000	39,500	36,400	29,890
Tangerines	5,000	4,700	5,100	4,660
California				
Navels and miscellaneous	14,500	15,170	15,330	15,742
Valencias	23,000	23,600	24,090	26,629
Texas				
Early and midseason	1,500	1,150	1,100	1,732
Valencias	500	450	400	924
Arizona				
Navels and miscellaneous	550	440	510	514
Valencias	750	710	620	507
Louisiana				
.	115	195	175	238

*Boxes hold 77 lb. in California and Arizona; 90 lb. in other states; grapefruit somewhat less.

Peaches.—The U.S. 1956 peach crop of 68,285,000 bu. was the largest since 1949, about 30% larger than the small 1955 crop, and slightly above the 10-year average. It included a record California Clingstone crop of 27,085,000 bu. The southern states crop, though much above the near-failure of 1955, was about

Table III.—U.S. Peach Production by Leading States
(In thousands of bushels)

State	Indicated 1956	1955	Average, 1945-54	State	Indicated 1956	1955	Average, 1945-54
California . .	38,878	34,002	32,423	Georgia . .	1,600	*	3,492
South Carolina	4,250	*	3,716	New Jersey .	1,600	1,700	1,625
Michigan . .	2,650	2,300	3,550	Washington .	1,540	2,100	1,747
Pennsylvania .	2,300	2,900	2,311	Virginia . .	1,500	470	1,459
Arkansas . .	1,980	*	1,766	New York . .	1,060	1,400	1,310
Colorado . .	1,830	2,110	1,762	Ohio . . .	1,000	1,030	914

*Less than 500 bu.

20% below average. Harvest time prices to producers were reduced to an average \$2.38 per bu. in August as compared with \$2.96 a year earlier. The dried peach pack approximated that of 1955.

Pears.—U.S. production in 1956 was estimated at 32,307,000 bu., largest since 1949, 9% above 1955 and 7% above average. Both California and Oregon had record high Bartlett crops. Prices to producers in October of \$2.05 per bu. exceeded the \$1.82 of a year earlier. Exports were 800,000 bu. in 1955-56, 15% larger than in 1954-55; imports were 424,000 bu., double those of the previous year.

Table IV.—U.S. Pear Production by Leading States
(In thousands of bushels)

State	Indicated 1956	1955	Average, 1945-54	State	Indicated 1956	1955	Average, 1945-54
California				Michigan . .	1,250	950	740
Bartlett . .	15,668	12,876	12,251	New York . .	490	700	478
Others . .	1,958	1,583	1,762	Utah . . .	330	200	187
Oregon				Colorado . .	235	150	194
Bartlett . .	2,760	2,700	2,118	Illinois . .	200	90	199
Others . .	3,840	3,350	3,333	Tennessee .	130	5	116
Washington				Texas . . .	123	20	253
Bartlett . .	3,000	4,600	4,630	Idaho . . .	110	110	67
Others . .	1,410	1,850	1,716	Mississippi .	107	5	186

Northern hemisphere pear production in 1956 was about 106,658,000 bu. (excluding cider pears) as compared with 116,075,000 bu. in 1955 and an average of 99,053,000 bu., 1945-49. Most of the reduction was in Europe.

Pineapples.—Hawaii continued to provide about 70% of the world's production, much of it destined for U.S. markets.

Malayan production recovered to a level of 28,000 tons, as compared with 76,000 tons prewar. A large part of the approximately 1,250,000 cases canned was exported.

Plums and Prunes.—The U.S. 1956 plum crop of 104,900 tons was 15% above 1955 and 25% above average. California accounted for about 95% of the total. Production of prunes in the Pacific northwest for fresh use, canning and freezing was 95,700 tons, 4% below 1955 and 7% below average. The California dry prune crop, indicated at 180,000 tons, was a large one, 2% above average and 37% larger than 1955.

The Yugoslav crop, badly damaged by a February freeze, was estimated at 130,000 tons (fresh basis), the smallest in 35 years and comparable with 996,000 tons in 1955.

Strawberries.—U.S. production in commercial areas in 1956 was 15,500,000 crates of 24 quarts each—much larger than the above-average crop of 1955. The frozen pack was a record one and prices somewhat lower. Acreage for 1957 was indicated at 122,600 ac., 4% larger than that harvested in 1956; Oregon and Washington accounted for most of the expansion.

The 1956 Mexican crop was estimated at 7,700 tons as compared with 8,800 tons in 1955. About 75% of the crop was exported, much of it in frozen form.

Tangerines.—The Florida tangerine crop was forecast at 5,000,000 boxes, 500,000 boxes more than 1955 and 12% above average.

(See also FROZEN FOODS; HORTICULTURE.) (J. K. R.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Apples* (From Seedling to Market (1950); *Orange Grower* (1939).

Furniture Industry. The U.S. furniture industry produced approximately \$2,750,000,000 goods during 1956 as against \$2,490,000,000 the preceding year, according to estimates of the National Association of Furniture Manufacturers, thus placing it second among the nation's durable goods industries. The automobile industry remained in first place. In contrast to the latter, however, the furniture industry comprised more than 5,000 relatively small manufacturing establishments, widely dispersed geographically but concentrated mainly in the middle and southern Atlantic, east north central and Pacific states.

The federal census of manufactures for 1954 showed that the number of individual establishments had grown from 3,951 in 1947 to 5,202 in 1954—an increase of 32%. In 1954 about 210,700 persons were employed in the industry, of whom 172,300 were production workers. About half of all individual manufacturing plants had sales of less than \$200,000 each.

Production data released in 1956 for the year 1953 showed that North Carolina led all other states in furniture manufacture, with gross output for the year estimated at \$257,000,000. New York was second in total value of output, with \$205,000,000, followed by Illinois (\$202,000,000), Indiana (\$185,000,000), Virginia (\$143,000,000), Pennsylvania (\$129,000,000), California (\$126,000,000), Michigan (\$103,000,000), Ohio (\$90,000,000) and Massachusetts (\$86,000,000). The metropolitan area of New York city continued to rank first in total retail sales of household furniture, followed by Chicago, Los Angeles, Philadelphia, Pittsburgh and Detroit, in that order.

Despite its record rise in total production and sales, the furniture industry generally continued to operate on a small profit margin in both 1955 and 1956 because of severe price competition. According to the National Association of Furniture Manufacturers, the average profit of all establishments after taxes was only 3.6% of net sales in 1955. The industry likewise lagged in developing foreign markets. In 1954, for example, the U.S. imported more furniture by value than it exported; the comparative figures for that year were \$6,984,428 against \$6,831,385. Exports amounted to only 0.3% of the total estimated value of production by U.S. manufacturers.

Manufacture of U.S. Furniture by Types, 1947 and 1954

	1954	1947	Per cent increase
Upholstered	\$658,553,000	\$390,606,000	69
Metal	397,006,000	218,223,000	81
Case goods (bedroom, dining room) . .	627,909,000	550,239,000	14
Tables	120,589,000	74,226,000	62
Infants' and children's	52,388,000	49,672,000	6

By 1956 there were approximately 25,000 retail furniture stores in the United States. Most of the marketing of goods in these stores continued to be accomplished through the traditional channel of furniture markets, of which Chicago's continued to lead in extent of displays and volume of wholesale business.

ENCYCLOPÆDIA BRITANNICA FILMS.—*Furniture Craftsmen* (1940).

Furs. Retail sales of furs in the United States appeared likely to reach between \$290,000,000 and \$300,000,000 by the end of 1956, a gain of between 5% and 10% over the previous year. However, sales were expected to run far behind the 1955 peak of nearly \$500,000,000, although well above the 1953 low of \$230,000,000. While the gain over 1955 volume was encouraging to certain trade elements in the ranching and manufacturing fields, it did not reflect a healthy trade situation generally. In fact the volume advance in 1956 was attributable in most part



WOOL COAT lined with Norwegian blue fox fur, from the Patou collection exhibited in Paris, Fr., in 1956

a continuing fashion trend toward mink garments of all types, to the detriment of several traditional fur types, notably squirrel, muskrat and raccoon.

In the domestic mink field, the pastel shades were dominant both in terms of production and consumption, replacing the dark standard shade as the most popular of all mink types. Also popular in the mink field, however, were such colours as sapphire, silverblue, and to a lesser extent because of limited quantity, gunmetal.

Overproduction and lowering of quality standards were the chief problems facing the ranching industry. United States production had risen from about 2,900,000 to more than 3,200,000 skins during the 1955-56 auction season despite the efforts of marketing organizations to discourage an increase. In addition, more than 1,000,000 skins, both dark and pastel, had entered the U.S. from Scandinavia.

Other furs that appeared to be selling up to expectations at the retail level included Alaska fur seal, sheared beaver, Brazilian marten, Russian broadtail, mouton processed lamb and, unexpectedly, Persian lamb. While mouton had suffered somewhat from competition in the Dynel-Orlon field, improved styling and the introduction of a host of new shades, including beiges and greys, had compensated for losses to so-called imitation fur garments.

Skin dressing figures on Persian lamb were discouraging. They showed that less than 2,200,000 skins had been dressed and dyed the previous year, for use in 1956. This compared with peak year figures of nearly 10,000,000 skins. However, a cyclical fashion change to longer garments in certain areas of the nation, the promise of a cold winter based on 1955-56 experiences, introduction of lightweight garments, an accent on better styling and improved promotional activity buoyed up interest in Persian lamb from June through the early fall period. Most important manufacturers, projecting their results during 1956 through the

end of the year, predicted dollar gains of 5% to 20%. All agreed it would be their best year since 1951 when the Korean war prompted a wave of "scare buying."

Wholesale prices, in general, were below 1955 levels. This was particularly true for beaver, Persian lamb, mouton, pastel mink, squirrel, fox and muskrat. Stronger prices were experienced for raccoon, gunmetal, silverblue and fine dark mink. Alaska seal tended to maintain its 1955 price because the supply could be controlled by the U.S. government.

Toward the late fall period, Persian lamb prices began to rise in keeping with increased domestic interest, and with the growing industry in Europe, especially in west Germany.

The credit structure continued to show serious signs of instability. A scare appeared in the trade early in the year when, within a period of four months, the industry sustained two bankruptcies, each for an estimated \$1,000,000. Despite a snowballing effect, these large losses were checked by the end of June, and no large breakdowns were anticipated during the remainder of 1956.

One favourable sign that tended to alleviate concern about the one-fur nature of the industry and the unstable financial picture was a decided increase in the use of fur trimmings. The furs most affected were white, dark and pastel mink, blue- and silver fox and, to lesser degrees, beaver and Persian lamb. The new trimming interest in the coat and suit, dress and sportswear industries appeared certain to raise the market prices of the furs most desired.

(E. Gd.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Fur Trapper of the North* (1951).

Future Farmers of America: see SOCIETIES AND ASSOCIATIONS, U.S.

Gaitskell, Hugh Todd Naylor (1906–), British statesman, was born at London, Eng., April 9. He succeeded Clement Attlee as leader of the Labour party on Dec. 14, 1955. He was educated at Winchester and at New college, Oxford, where his socialist convictions were reinforced by study under G. D. H. Cole. He lectured in political economy at University college, London, from 1928 until appointed head of the department of political economy in 1938. During this period he was associated with the New Fabian research bureau in the reformulation of socialist economic thought, publishing *Chartism* in 1929 and *Money and Everyday Life* in 1939. In Sept. 1939 he entered the civil service and served during World War II in the ministry of economic warfare and at the board of trade. In 1945 he was elected to parliament as member for South Leeds. As minister of fuel and power he dealt firmly with the fuel crisis of 1947, and after the election of 1950 he became minister of state for economic affairs, succeeding Sir Stafford Cripps as chancellor of the exchequer in October. He was elected party treasurer in Sept. 1954 and renominated in April 1955.

During the visit of the Soviet leaders to Great Britain in April 1956, his request that N. S. Khrushchev, first secretary of the Soviet communist party, should use his influence to secure the release of certain Social Democrats imprisoned in the U.S.S.R. and other eastern European countries was rejected.

As leader of the opposition in parliament, Gaitskell condemned the action of Pres. Gamal Abdel Nasser of Egypt in seizing control of the Suez canal, but censured the British government for delay in referring the dispute to the United Nations Security council.

At the Labour party conference in October he made a successful appeal for unity within the party.

Galapagos Islands: see ECUADOR.

Gambia. This British colony and protectorate on the west coast of Africa is surrounded by the French territory of Senegal. Area: 4,003 sq.mi., including protectorate 3,974 sq.mi. Pop. (1951 census): colony 27,297; protectorate 252,389 (1955 est. 285,000). Language: many tribal dialects; Hausa. Religion: mainly Moslem, some pagan; about 5,000 Christians in Bathurst. Capital, Bathurst, pop. (1951 census) 19,602. Governor in 1956, Sir Percy Wyn Harris.

History.—In June 1956 K. A. S. Smith, assistant chief secretary of Aden, was appointed colonial secretary. At the end of the year, the governor toured the territory to remind the native authorities of their responsibility for preventing the smuggling of groundnuts (peanuts).

In Oct. 1955 an affray had taken place in Bathurst between the supporters of P. S. N'Jie, minister of education and welfare, and those of I. M. Garba-Jahumpa, another minister, following an election to the Bathurst town council. N'Jie wrote officially to the chief superintendent of police making serious allegations against the conduct and probity of the police. An inquiry, however, found that the conduct of the police had been beyond reproach and in no way biased. N'Jie was thereupon relieved by the governor of ministerial responsibility and suspended from the executive council. (W. H. Is.)

Education.—Schools (1955): primary 46, pupils 5,016, teachers 95; secondary 5, pupils 621, teachers 20; vocational 4, pupils 65, teachers 7; teacher training 1, students 34, teachers 5.

Finance and Trade.—Monetary unit: West African pound (£W.A.1 = £1 sterling = U.S. \$2.80). Budget (1955 est.): revenue £1,338,037, expenditure £1,274,744. Foreign trade (1955): imports £3,709,752, exports £2,472,439. Main exports: peanuts, palm kernels, beeswax, hides and skins.

Gambling: see BETTING AND GAMBLING.

Gas, Natural and Manufactured. In 1955, as before, so few countries producing a large part of the natural gas reported their output that it was not possible to compile complete world data on it. However, Table I shows the known output of those countries producing important quantities of natural gas, and Table II shows similar data for manufactured gas, both according to reports in the *Monthly Bulletin of Statistics*, UN.

Table I.—Natural Gas Production*

	1951	1952	1953	1954	1955
United States	4,377,155	4,753,466	5,129,776	5,587,875	6,240,062
Venezuela	50,853	61,871	76,703	82,636	97,044
Canada	79,669	88,569	100,858	122,894	151,287
Mexico	86,026	93,654	93,230	94,078	120,352
France	9,959	9,408	8,645	9,154	9,662
Italy	34,114	50,599	80,517	105,096	127,980
Brunei	36,656	38,648	41,445	38,775	41,572
Trinidad	16,612	16,866	17,671	18,180	17,587
Colombia	17,375	7,204	16,951	19,494	19,070

*Excluding gas used for repressuring, as well as gas flared, vented or otherwise wasted.

Table II.—Manufactured Gas Production

	1951	1952	1953	1954	1955
Australia	37,885	40,386	41,276	42,250	43,310
Austria	10,764	10,510	10,298	11,654	12,205
Belgium	61,023	62,718	62,295	68,651	73,313
Canada	28,139	26,316	25,893	26,316	18,943
Denmark	13,646	13,688	13,434	13,730	13,773
France	86,026	87,721	87,721	91,535	88,145
Saar	53,395	54,667	51,277	53,395	58,057
Germany, western	567,856	633,541	651,763	636,931	737,366
Italy	66,109	71,618	70,346	72,889	75,432
Japan	49,158	57,209	67,380	75,008	83,060
Netherlands	59,328	61,871	61,871	66,532	70,770
United Kingdom	563,195	569,975	564,466	586,926	600,911
United States	525,903	488,611	446,233	441,996	452,590

United States.—Table III, which was compiled from data from the U.S. bureau of mines and the American Gas association, shows a continuing upsurge during 1955. Natural gas was used in 43 of the 48 states in 1955 and consuming areas were extended therein in 1956. Department of commerce reports show exports in 1955 included 20,495,724,000 cu.ft. to Mexico and 5,744,666,-

Table III.—Production and Consumption of Natural Gas in the U.S.

	1950	1951	1952	1953	1954	1955
Gross production	8,479.7	9,689.4	10,272.6	10,645.8	10,984.8	11,719.8
Loss and waste	801.0	793.2	848.6	810.3	723.6	773.6
Returned to ground†	1,396.6	1,438.8	1,410.5	1,438.6	1,518.7	1,540.8
Marketed	6,282.1	7,457.4	8,013.4	8,396.9	8,742.5	9,405.4
Exports	26.2	24.2	27.5	28.3	28.7	31.0
Consumption	6,026.4	7,102.6	7,613.6	7,979.0	9,799.5	10,223.7
Domestic	1,198.4	1,474.7	1,622.0	1,685.5	1,894.2	2,124.0
Commercial	387.8	464.3	515.7	530.7	585.0	629.2
Field use	1,187.5	1,441.9	1,483.8	1,471.1	1,456.9	1,507.7
Carbon black	410.9	426.4	368.4	300.9	251.2	244.1
Oil refineries	455.1	537.8	536.4	558.7	563.3	625.5
Cement plants	97.0	102.5	111.5	117.1	125.2	131.8
Other industrial	2,289.7	2,655.0	2,975.8	3,315.0	3,778.2*	3,808.1
Public utilities†	628.9	763.9	910.1	1,034.3	1,165.5	1,153.3
Interstate traffic	2,543.5	3,242.8	3,794.5	4,172.5	4,661.9*	5,114.5

*Revised. †Mostly for repressuring oil fields; small amounts of surplus gas are returned to the ground for storage. ‡Includes manufactured gas, and not included in the consumption total.

000 cu.ft. to Canada. In the first quarter of 1956, the daily average marketed production of natural gas was 7% over the previous year. Residential consumption increased 11%, commercial 7% and industrial 12%. In the second quarter of 1956 the marketed production was 9% above the same quarter of 1955. Because of cool weather, residential consumption increased 25% and commercial 26%. Industrial use increased 16%.

Coke-oven Gas.—About 14,726 cu.ft. of gas per ton of coke made was produced in by-product coke ovens in 1955. Of the 1,083,624,595,000 cu.ft. made in 1955, waste and leakage accounted for 20,684,416,000 cu.ft. and 373,592,239,000 cu.ft. was used to heat ovens. The remaining 689,347,940,000 cu.ft. was used as follows: 8% under boilers, 69% in steel plants, 10% servicing city gas mains and 13% for other industrial uses, as reported by the U.S. bureau of mines.

(See also FEDERAL POWER COMMISSION; PETROLEUM.)

(F. E. H.; B. B. M.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Gas for Home and Industry* (1949).

Gasoline: see PETROLEUM.

Gas Turbine Engines: see JET PROPULSION.

G.A.T.T.: see TARIFFS.

Gem Stones. The United States does not produce any precious stones (diamond, emerald, ruby or sapphire), but imports a substantial quantity of gems, as shown in Tables I and II, based on U.S. department of commerce data and the U.S. bureau of mines compilations. The imports include also gems of natural origin, such as pearls, and synthetic stones.

The United States produces a great variety of semiprecious and ornamental gem stones. Output of gems in 1955 was worth more than \$800,000, an increase of about \$100,000 over 1954.

Table I.—U.S. Imports of Gem Stones

	1955		1954	
	Carats	Value	Carats	Value
Rough diamonds	1,064,932	\$76,735,186	887,702*	\$59,423,768
Cut diamonds	707,859	74,833,550	594,772	62,758,349
Cut emeralds†	45,233	1,564,676	24,460	385,063
Pearls, natural		669,351		503,753
Pearls, cultured		6,197,897‡ .		4,333,890*
Marcasites, real and imitation		44,439		61,073
Other varieties				
Rough		228,939		265,837‡
Cut		2,837,932		1,848,989‡
Imitation		12,150,056‡		14,008,155
Total		\$175,262,026‡		\$143,588,877*

*Revised. †Effective Jan. 1, 1954, rough and cut emeralds not classified separately, but rough included with precious and semiprecious stones, rough or uncut. ‡Because of changes in tabulating procedures by the U.S. department of commerce, data known not to be comparable to earlier years.

Table II.—Value of U.S. Imports of Gem Stones

	1955	1954
1945	\$114,435,231	\$128,953,866
1946	189,017,646	124,699,402
1947	110,076,029	130,194,343
1948	115,940,031	143,588,877*
1949	84,132,466	175,262,026
1950	118,508,049	

*Revised.

Gem collectors and lapidaries continued to compose the principal market for the domestic stones.

(See DIAMONDS; MINERALOGY.)

(F. E. H.)

Genetics. **Human and Mammalian Genetics.**—H. W. Kloepper and J. W. Rosenthal made an extensive study of two large kindreds carrying pedigrees of the recessive type of the spherophakia-brachymorphia syndrome, marked by short fingers and stature and several eye abnormalities. They were able to identify most of the heterozygous carriers by careful measurement of stature and finger length. Another so-called recessive in man was thus added to the growing list of hereditary diseases recognizable in heterozygous carriers by the use of proper tests.

E. H. Chu and N. W. Giles made chromosome counts on six species of old world monkeys; in three the chromosome number was 42, and in the other three the numbers were respectively 54, 60 and 66. All somatic chromosome numbers in primates determined to date, including man with 48, were multiples of 6, although the interpretation of this situation was not yet clear.

With the increased interest in human genetics and particularly in the genetic effects of radiation in man, the genetics of the other mammal, the mouse, best adapted to large-scale study, took on added significance. In the monumental experiment on the genetic effects of radiation in the mouse being carried on by W. L. Russell and collaborators, Russell reported a significantly lower proportional mutation rate at 1,000-r radiation in the mouse than at 300-r and 600-r. He suggested a possible "heterogeneity among spermatogonia with regard to radiation sensitivity, and that sensitivity to damage that results in cell death is positively correlated with sensitivity to mutation. Thus at the higher dose more of the sensitive spermatogonia would be killed and the mutation rate in the more resistant cells that survive would be lower."

New mutations in the mouse were reported as follows: cordovan, a new allele of black and brown colour by D. S. Miller and M. Z. Potas; steel, a new dominant coat colour, by P. A. Sarvella and L. B. Russell; blind, lethal in homozygote and causing blindness in the heterozygote, by L. Vankin; and tufted, a recessive causing repeated waves of hair loss and regrowth, by M. F. Lyon.

Biochemical Study of Chromosome Structure.—R. P. Levine demonstrated an increased amount of crossing over between homologous chromosomes in the fruit fly, *Drosophila melanogaster*, subjected to calcium deficiency, and a corresponding decrease in crossing over with excess calcium in the diet. R. A. Eversole and E. L. Tatum secured similar results in crossover frequency in the green alga, *Chlamydomonas*, by varying the amount of calcium and magnesium in the culture medium. They concluded that "the sensitivity of crossing-over in *Chlamydomonas* to ionic environment is consistent with the theory that chromosomes are composed of macronuclear unit particles linked together by divalent ions."

Dale Steffenson found a greatly increased amount of spontaneous chromosome fragmentation in the plant, *Tradescantia*, under calcium deficiency. Sheldon Wolff and H. E. Luippold irradiated seeds of the plant *Vicia faba* and found two types of chromosome breaks. One type, which rejoined rapidly, was interpreted as a break in an ionic bond, the calcium bond, and the other type, which rejoined slowly, was interpreted as a break in a covalent chemical bond requiring energy intake for restitution. The concurrent results of calcium deficiency on chromosome fragmentation and crossing over lent weight to the hypothesis of Daniel Mazia that calcium forms bonds with terminal phosphate groups of different deoxyribonucleic acid, DNA, units in the structure of the chromosome.

D. P. Bloch suggested a mechanism for chromosome replica-



CURLY-HAIRED CAT, apparently produced by a genetic mutation, born in England in 1950. Bred back to his curly-haired daughter, this male produced additional curly-haired offspring, and by 1956 a true-breeding curly-haired line had been established. The cats were owned by Mrs. Nina Ennismore of Cornwall, Eng.

tion during cell division based on a double helical structure of DNA with histone cross bonds between the original polynucleotide helices and also between the newly replicated helices. L. S. Lockingen and A. G. DeBusk constructed a theoretical model to account for the formation of ribonucleic acid, RNA, units from minimal chemical units of DNA and the subsequent restitution of the DNA. By this mechanism the RNA units could be released from time to time to the surrounding cytoplasm to serve as enzymes in various chemical syntheses in the cell.

By an ingenious technique C. Levinthal was able to label the DNA of a bacteriophage with radioactive phosphorus and to measure the amount of this labelled phosphorus per particle. After several divisions of phage particles he could still measure the amount of phosphorus label per individual particle. The results of this experiment indicated that during repeated reproduction of phage particle the labelled phosphorus remained in one large piece of DNA and was not distributed to the new pieces of DNA being formed. These findings lent strong support to the hypothesis that new DNA molecules are replicated with the old molecule serving as a template. Most of the DNA per phage particle was in one large piece thought to be the genetic material of the phage particle. Further studies by Levinthal and C. A. Thomas indicated that this large piece of phosphorus labelled DNA remained intact after the formation of new genetic recombinations. They concluded that such recombinations were formed, not by physical crossing over, but by *de novo* formation of the new chromosome or DNA piece, under the co-operative control of two parental chromosomes.

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Geography. Geographic attention in 1956 focused on Rio de Janeiro, Braz., where, on Aug. 9–18, the International Geographical union held the 18th International Geographical congress and convened its 9th general assembly. The attendance at the meetings was 1,013, representing 48 countries. The union promotes international co-operation by maintaining a number of commissions for the study of special problems. Eleven commissions (arid zone, bibliography of ancient maps, coastal sedimentation, erosion surfaces around the Atlantic, evolution of

slopes, inventory of world land use, karst phenomena, library classification of geographical books and maps, medical geography, periglacial morphology and teaching of geography in schools) presented reports, and four new commissions (applied geomorphology, humid tropics, national atlases and population mapping) were established.

Ethiopia, Hungary, Iceland and the U.S.S.R. were granted full membership in the union. French West Africa, Iraq, Kenya, Nigeria, Sudan and Uganda were made associate members. The total number of nations adhering to the union in 1956 was 42 with 6 associates.

Among other significant international geographical meetings, the International Geographical union and the United Nations Educational, Scientific and Cultural organization (UNESCO) jointly sponsored a symposium on natural resources and population in intertropical Africa at Makerere college, the University College of East Africa, during Sept. 10-17, 1955. In Jan. 1956 the Indian Universities commission sponsored an International Geographical seminar, attended by nearly 200 geographers, at the Aligarh Moslem university. The part played by geography in national planning and reconstruction was apparent among the diversified papers presented. The seminar demonstrated remarkable advance in geographic research and the application of geographic techniques in government not only in India and Pakistan but especially in the Soviet Union and satellite states.

The Congress of Hungarian Geographers, held in Budapest from Sept. 19 to 23, 1955, was mainly a regional meeting of geographers of the "iron curtain" countries, as was the congress of the U.S.S.R. Geographical society held in Moscow earlier in 1955. It was reported that more than 2,000 geographers, representing all parts of the U.S.S.R. and 11 other countries, attended the Moscow meeting. The Hungarian geographers' meeting was attended by delegates from Bulgaria, Czechoslovakia, Poland, Rumania and the U.S.S.R. Announced at the conference was the institution of faculties of geography in four Hungarian universities (Budapest, Debrecen, Pecs and Szeged), an institute of geographical science and research in the Academy of Sciences in Budapest, and the re-establishment of the Hungarian Geographical society originally founded in 1872.

Another regional meeting was the convening of the Commission of Geography of the Pan American Institute of Geography and History at Rio de Janeiro from July 30 to Aug. 4, 1956. In attendance were representatives of Brazil, Bolivia, Chile, the Dominican Republic, Ecuador, Guatemala and the United States.

Polar Expeditions.—Knowledge of both arctic and antarctic areas was increasing because of the many scientific and practical operations being conducted. The Soviet northern sea route was operating as many as 100 ships annually, some making the 3,000-mi. run from Murmansk to Bering strait. About 100 coastal and 3 drifting stations were providing ice and weather forecasting data.

In the North American arctic 90 ships engaged in supply of northern stations and two overland trucking operations successfully made freight hauls from Alaska to Mackenzie bay, Canada.

In preparation for the International Geophysical year, 1957-58, scientific stations were being readied in both the arctic and antarctic. As part of its scientific program on the Greenland ice cap, the U.S. army corps of engineers conducted a training school for glaciologists representing eight nations. Design criteria were developed for under-ice structures such as personnel and storage shelters and road and railway tunnels.

In the antarctic 11 countries prepared to man 56 International Geophysical year stations. During the 1955-56 season the U.S. antarctic Operation "Deepfreeze I" built and occupied two stations, 73 men wintering on Kainan bay and 93 on McMurdo sound. In the period Oct. 1956 to March 1957, stations would be

occupied at 80° S. 120° W. and on the 10,000-ft. plateau at the south pole. Accomplishments included aerial observation of approximately 800,000 sq.mi. of previously unobserved Antarctic and discovery of a new high ice dome in the vicinity of 82° 49' 90° E. Two firsts in aviation included a flight of two Skymasters and two Neptunes nonstop from New Zealand to McMurdo sound, and a flight across the south pole from McMurdo sound to the Weddell sea and back, a distance of 2,400 mi. Seven ships in addition to cargo-carrying and icebreaking functions, surveying tens of thousands of square miles of ocean bottom, made hydrographic and biological investigations and landed numerous shore parties to check various geographic features.

Between Sept. and Dec. 1956, a total of 12 ships left east and west coast ports of the United States on Operation "Deepfreeze II." More than 3,500 men including 89 scientists were engaged in this operation, which, in addition to relieving the crews of Little America V and McMurdo sound, established stations on the Knox Coast, Weddell sea and Cape Adare, bringing the total U.S. stations to seven.

By 1956 several nations had already established 39 stations on the antarctic or on subantarctic islands. Among these, 22 were on the continent proper and 20 were on the Palmer peninsula alone. The Argentine station, General Belgrano, on the Weddell sea and the Australian station at Mawson were the only other proposed International Geophysical year stations in operation by 1956 on the continent.

The French station at Pointe Géologie was reoccupied in Jan. 1956 by a 14-man expedition under Paul Emile Victor, and in the same month the Soviet flagship "Ob" reached Farr bay and the expedition, led by M. M. Somov, established its station and a landing strip from which its planes began reconnaissance flights of the continent. From this station they later established the permanent base, Mirny, of 24 buildings near Haswell Island and later explored the "oasis" at Bunger hills.

On Jan. 11 the expedition ship "Tottan" of the Royal Geographical society of Great Britain arrived in the Weddell sea and prevented by ice from reaching the proposed site at Duke Ernest bay, established their station 150 mi. E. at 75° 50' S., 26° 30' W. The second British ship, "Theron," was trapped in the ice 25 days and finally established Shackleton post office with a wintering party of eight men about 40 mi. from the Argentine General Belgrano station. From this point an expedition planned to traverse the continent to the Australian station of Mawson. An Australian traverse team had already penetrated more than 20 mi. to the foot of a newly discovered range of mountains where a cache was established. Another British 46-man expedition carried out an aerial mapping survey of 1,000 sq.mi. of Graham Land (Palmer peninsula).

Other stations were being established by Chile, Japan, Norway and New Zealand. (See also ANTARCTICA; INTERNATIONAL GEOPHYSICAL YEAR, 1957-58.)

Geographic Societies.—The Ford foundation granted the American Geographical society \$140,000 to be used to develop an internship program that would provide continuity in the society's program and maintain the specialized knowledge of senior members of the staff. The society engaged in a series of expeditions, in collaboration with the U.S. air force and Georgetown university, Washington, D.C., to observe the Dec. 14, 1955, total eclipse of the sun from stations in Somaliland, Sudan, Ethiopia, Ceylon, Burma, Thailand, Cambodia, Vietnam and Formosa. It continued its glacial research program in Alaska, began a new program of glacier inventory, assisted in planning the International Geophysical year glaciological program and issued a new four-sheet general reference map of Antarctica on a scale of 1:3,000,000.

The Association of American Geographers held its annual

meeting at Montreal, Que., April 1-5, 1956. The Outstanding Achievement award was conferred on John K. Wright, and citations were presented to Robert B. Hall and Victor Roterus. The National Council of Geography Teachers presented the annual Distinguished Service award to J. Russell Whitaker and *Journal of Geography* awards for outstanding professional articles published in that magazine to Thomas F. Barton, Neville V. Scarfe and Earl B. Shaw. The Geographical Society of Philadelphia awarded the Henry Grier Bryant gold medal to Lester E. Klimm.

The Royal Geographical society awarded the Patron's medal to John Giaever, leader of the Norwegian-British-Swedish antarctic expedition (1949-52); the Founder's medal to Charles Evans, leader of the Kanchenjunga expedition of 1955; the Murchison grant to Alice Garnett, for contributions to physical geography and geographical education; the Mrs. Patrick Ness award to Robert Dovers of the Australian National Antarctic expedition; the Gill memorial to R. A. Skelton, for studies on the history of cartography and exploration; the Back grant to Richard Hamilton, chief scientist of the British North Greenland expedition (1952-54); and the Cuthbert Peck grant to David Oates, for archaeological surveys in Iraq.

(See also CARTOGRAPHY; EXPLORATION AND DISCOVERY; GEOLOGICAL SURVEY, U.S.; NATIONAL GEOGRAPHIC SOCIETY; SOCIETIES AND ASSOCIATIONS, U.S.) (L. O. Q.)

ENCYCLOPEDIA BRITANNICA FILMS.—*Airplane Changes Our World Map* (1942); *Our Earth* (1937).

Geological Survey, U.S. This bureau in the United States department of the interior has as its principal objectives the determination and appraisal of the nation's mineral and water resources, delineation of the physical features of the United States, its territories and possessions, and supervision of mineral leasing on federal and Indian lands.

During 1956 emphasis continued to be placed on activities to attain these objectives—the preparation of topographic, geologic and hydrologic maps; systematic collection, exploration, appraisal and interpretation of quantitative and qualitative data on mineral and water resources; classification of public lands for mineral and water-power potential; supervision of mining and oil and gas development on federal and Indian lands; fundamental research in the sciences and techniques involved; and publication and dissemination of maps and reports setting forth the results of its investigations and mapping. In addition, the survey was frequently called upon to provide consultative and technical services to other federal agencies.

Publications.—The primary purpose of the geological survey is to provide for the people and agencies of government such information as is necessary for the exploration, development and conservation of U.S. mineral and water resources. Books, pamphlets, maps and charts were published in 1956 in part by the survey and also by co-operating states and by scientific journals. Publications included maps of the topographic and geologic features of the United States; studies of mining districts and mineral deposits, of the composition and structure of rocks and minerals, of fossils and the rocks in which they are found, of geophysics and geochemistry; and studies of stream flow and ground waters and their chemical quality.

Altogether, 3,019 survey topographic, geologic, hydrologic and related maps were published or reprinted during 1956. In addition, 147 reports, consisting of professional papers, bulletins, water-supply papers, circulars, hydrologic atlases and chapters for the new edition of the topographic manual, were published. Production of maps increased about 13% over the fiscal year 1955. Several hundred free map indexes showing all areas covered by U.S. geological survey mapping in each state, and free booklets listing all survey publications, were mailed out each

month in answer to public inquiries.

Geologic Investigations.—During 1956 the geologic division carried on co-operative investigations with 13 states, Puerto Rico and Alaska. A milestone in the progress of geologic mapping was the publication of a geologic map of Montana.

New developments in geophysical, geochemical and geobotanical prospecting aided exploration for new deposits of minerals and mineral fuels. In co-operation with engineers of the bureau of mines, survey geologists continued to evaluate applications for loans to mining companies and individuals and to supply technical advice necessary for effective execution of contracts under the Defense Minerals Exploration administration and the Emergency Procurement service.

A research project to study living Foraminifera on the continental shelf was started in 1956 in co-operation with the Scripps Institution of Oceanography. Survey scientists also collaborated with the West Virginia geological survey and several private institutions in making detailed studies of drill cores from the first well to penetrate the sedimentary sequence and reach rocks of the basement complex in the heart of the northern Appalachian oil and gas basin. The 11th edition of the map showing oil and gas fields of the United States was published. A completed study in the Piceance creek basin of northwestern Colorado showed the amount of oil present in the oil-shale deposits there to be approximately double that of previous estimates.

Engineering geologic investigations were continued in the metropolitan areas of Seattle, Wash., Portland, Ore., San Francisco and Los Angeles, Calif., Denver, Colo., Knoxville, Tenn., and Anchorage, Alaska, to provide basic geologic information pertinent to urban development. Reports on the general geology and volcanology of several Aleutian islands, studied in earlier years for the department of defense, were completed. Studies of the physical properties of rocks and minerals were increased, and facilities were made available for measurement of electrical resistivity, dielectric constant, magnetic susceptibility, remanent magnetization and dynamic elastic moduli. Radiocarbon age determinations made on a series of deep-sea-core carbonates allowed an extrapolation to the earliest Pleistocene climatic cycles, based on an assumed uniform sedimentation rate. Research in geochemical exploration continued to provide new geochemical and geological concepts and techniques to aid in the discovery of mineral deposits.

More than 45,000 fossils from 32 states, Alaska, Puerto Rico and 14 areas outside the United States were examined by palaeontologists and stratigraphers. The resulting information was incorporated in 551 administrative reports for use in guiding the field work of other geologists and for eventual publication.

Water Resources Investigations.—Although the United States is a water-rich nation except for a few regions such as the southwest, water supply has become a major national problem because requirements are increasing so rapidly. The basic facts contributing to the problem were population growth coupled with a rising standard of living.

In achieving its principal objective of an accurate appraisal of U.S. water sources, survey scientists and engineers systematically collected, analyzed and interpreted hydrologic and geologic data; evaluated water resources of specific areas; determined water requirements for industrial, domestic and agricultural uses; performed research and development to broaden the knowledge of basic principles in water occurrence and movement, and to improve its investigation techniques; and prepared technical and scientific reports for publication.

Since the survey's work meshes closely with many state and local interests in water supply, federal-state partnerships had developed with all the states. Federal funds for co-operative water investigations in fiscal 1956 amounted to \$4,580,000.

About 6,800 gauging stations to obtain stream-flow data were operated in 1956 in the U.S., Alaska, Hawaii and Guam. A project summarizing stream-flow records in the United States for the period 1888-1950 was about 68% complete. Flood frequency reports for Nebraska, Connecticut and Missouri, prepared co-operatively by the geological survey, were published. Flood studies were in progress in six other states at the end of 1956. Hydraulic data for about 90 stream sites were furnished to highway departments.

The devastating floods of Aug.-Oct. 1955, extending from New England to North Carolina, were documented by intensive field investigations, and a preliminary report published in 1956 as U.S. geological survey circular 377. Similar investigations followed the floods of Dec. 1955 and Jan. 1956 in the west coast region.

The growing importance of ground water to the nation caused a continued increase in demands for information on which to base plans for its use and conservation. Mutual federal and local interest was reflected in co-operative programs in 44 states, Hawaii and Guam. Of 550 ground-water investigations under way during 1956, about 80% were in the federal-state co-operative program.

The chemical quality of more than 65,000 samples of water from streams, lakes, springs and wells was determined, and sediment investigations were in progress in 15 states and Alaska in 1956.

Topographic Mapping.—This activity is designed to furnish accurate and detailed information on natural and man-made topographic features of the United States, its territories and dependencies. Since the geological survey was established in 1879 it had published about 18,500 different topographic maps that covered about 75% of continental U.S., although by the end of 1956 only 43% of the country was covered by maps that met modern needs. The next two decades were expected to see the country substantially covered with topographic maps made to modern standards. During 1956 mapping or map revision was carried on in all 48 states, Alaska, Puerto Rico, Hawaii and the Virgin Islands. In 30 states and Puerto Rico mapping was accelerated through federal-state co-operative programs whereby mapping costs were shared equally between the federal government and a state, county or municipality. Altogether, 2,353 map manuscripts were transmitted to the publications office for printing and distribution; 517 of these maps were transmitted for reprinting.

Conservation.—Conservation activities in 1956 were aimed at assuring proper development and use of water and mineral resources on federally controlled lands. This work required field surveys; preparation of maps and reports dealing with water power, fuels, minerals and chemicals; and on-site supervision of mining and drilling operations to assure safe and economical production of coal, oil, gas and other minerals.

In mineral classification alone, 28,884 cases were handled involving either the outright disposal of federal lands with no reservation of any mineral; disposal of such lands with qualifications; or exercise of the government's right to lease such property for minerals exploration and production by private enterprise.

More than 2,500 mining properties were under supervision during fiscal 1956, involving leases, permits and licences in 32 states and Alaska. Minerals production was estimated at nearly 19,728,000 tons, valued at more than \$135,274,000 with royalties amounting to \$5,862,000.

Drilling on supervised lands during fiscal 1956 included the spudding of 2,778 wells and completion of 2,525 wells, of which 1,711 produced oil or gas. In all, 33,860 wells, including 19,321 capable of producing oil or gas, were under supervision at the end of fiscal 1956. Production was appreciably greater than in

1955, and royalty returns to the United States amounted to about \$60,000,000.

(See also GEOLOGY.)

(H. B. N.)

Geology. Published articles and books show the evolution of thought, research and application of geology. Geologic literature produced in all fields of geology in 1956 was principally concerned with topics of limited scope, but the fields of general geology and stratigraphy were represented by fundamental or comprehensive writings.

General and Historical Geology.—A theoretical discussion entitled "Mountain Building Chronology and Nature of Geologic Time Scale" by Edmund M. Spieker appeared in the Aug. 1956 issue of the *Bulletin* of the American Association of Petroleum Geologists. Spieker challenged the concept of simultaneous orogenic movements by postulating that crustal deformation, even of a single tectonic unit, can be divided into subdivisions in both space and time, and illustrated by examples from the Laramide Revolution of western North America. He also questioned the validity of the application of a single time scale to the entire world, and contrasted the different time scales which might have been established on the different continents. As an example of the tenuous character of boundaries between even such large units as eras, he described the Palaeozoic-Mesozoic boundary in the Colorado plateau and the Rocky mountains, which is distinct in some areas and impossible to define in others.

Stratigraphic Geology (1950), 4th edition, by Maurice Gignoux was translated by Gwendolyn G. Woodford late in 1955. This French text was principally concerned with the geology of France, but the concepts of facies relationships in both space and time are so well expressed that it is a classic stratigraphic synthesis. A similar synthesis, W. J. Arkell's *Jurassic Geology of the World*, presented a complete study of the entire marine Jurassic system, including the basis for classification and correlation of the system, descriptions of the rocks, and syntheses of palaeogeography, climate, tectonic patterns and volcanism.

A University of Texas publication, *Proceedings of the Conference on Latin-American Geology*, edited by Fred M. Bullard, included papers in the fields of applied and economic geology, with Colombia, the Colombian Andes, Mexico, eastern Venezuela, Brazil and volcanism as principal subjects. *The Atlas of Paleogeographic Maps of North America*, by Charles Schuchert and edited by Carl O. Dunbar, was published in 1955. Schuchert's 1942 conceptions of North American palaeogeography were shown in these maps, and although more information was made available in the period 1942-1955, changes in the maps would be insignificant. In "Handbook of South American Geology, An Explanation of the Geologic Map of South America," Geological Society of America *Memoir* 65, edited by William F. Jenks, papers by 17 students in the field were published, which were planned to accompany the 1950 edition of the society's geologic map of South America. However, information discovered since publication of the map was included in the papers. Among the more significant issues were the statements that there were no definitely Pre-Cambrian rocks in the Andean belt and that except for Argentina there was comparatively little knowledge of the Lower Palaeozoic of South America, the large body of evidence for continental drift and the complexity of the Mesozoic and Cenozoic igneous history of western South America. An article was devoted to each nation in South America and one to the island of Trinidad. Five flat-topped seamounts (guyots) in a submarine range of mountains extending from Hawaii to near Wake Island were the subjects of Edwin L. Hamilton in "Sunken Islands of the Mid-Pacific Mountains," Geological Society of America *Memoir* 64 (1956). Bathymetric, dredge and core data furnished evidence for origin of the seamounts as a chain of

basaltic islands in the Cretaceous period, their reduction to flat banks by wave erosion later in the Cretaceous and submergence to their present depths during the Cenozoic because of regional subsidence.

Corollaries of the history were the presence of a deep Pacific ocean in Cretaceous time and faunal migrations from island to island rather than along "sunken continents."

Economic Geology.—The 50th anniversary volume of *Economic Geology*, edited by Alan M. Bateman and published in Oct. 1955, contained reviews of progress in various fields of economic geology since 1905. In part i, 13 articles by different authors were devoted to theoretical and practical discussions of the origin, classification and earth temperatures associated with ore deposits. Part ii contained 12 articles on such topics as engineering geology, ground water, fuels, geophysical prospecting for ground water and ores, and physical and chemical characteristics of certain minerals as related to their economic use. In keeping with the title of the volume, most articles contained reviews of developments in their fields. L. R. Page, H. E. Stocking and H. B. Smith compiled "Contributions to the Geology of Uranium and Thorium by the United States Geological Survey and Atomic Energy Commission for the United Nations International Conference on Peaceful Uses of Atomic Energy, Geneva, Switzerland, 1955," United States Geological Survey professional paper 300. Included were 89 reports on the occurrence of uranium and thorium in the United States and methods of prospecting for them. Mines and prospects were described. The analytical chemistry of the elements was discussed.

The United States department of agriculture published *Water, the Yearbook of Agriculture 1955*, edited by Alfred Stefferud. The book's 96 articles had essential value in that they stated the broad relationships between geology, ground water and agriculture. The translation by May Hollander of the revised edition of *Realms of Water* (1955) by P. H. Kuenen, an introductory book describing the hydrologic cycle, was published. Major subdivisions were: water in its inorganic states, the actions and effects of water on the surface and near-surface zone of the earth's crust, and geologic variations in the quantity of terrestrial water, salinity of the ocean and distribution of water among various environments. A symposium on ground water was presented in the Aug. 1956 issue of the *Transactions of the American Geophysical union*. V. C. Fishel, in "Long-Term Trends of Ground-Water Levels in the United States," correlated ground-water levels in several areas of the United States with precipitation records and concluded that lowered water tables were correlated with general drought conditions rather than with progressive depletion of the ground-water reservoir. Graphic methods of predicting ground-water levels nine months in advance were demonstrated in "Prediction of Ground-Water Levels on the Basis of Rainfall and Temperature Correlations" by M. I. Rorabough. William E. Clark, in "Forecasting the Dry-Weather Flow of Pond Creek, Oklahoma; A Progress Report," outlined a method of predicting dry-weather stream flow several months in advance, and considered the method to be applicable to many stream beds.

Engineering Geology.—George A. Kiersch prepared a basic outline of the field of engineering geology which was published in the July 1955 issue of the *Quarterly* of the Colorado School of Mines.

Geochemistry.—*Physics and Chemistry of the Earth* (1956) by L. H. Ahrens, Kalervo Rankama and S. H. Rincorn, the first of a series of periodic reviews of the physics and chemistry of the earth, presented articles by several authors which related geology, chemistry and physics to the origin of the earth, earth temperatures, the interior of the earth and associated topics.

Petroleum Geology.—A review of drilling activities in North

America for 1955 was given in the June 1956 issue of the *Bulletin* of the American Association of Petroleum Geologists. The international aspects for the same period were presented in the July 1956 issue of the *Bulletin* of the same organization and for a similar period in the International Outlook issue of *World Oil*, Aug. 15, 1956.

The latter included special reports on Canada and on the U.S.S.R. and its satellite countries.

Sedimentation and Marine Geology.—Lithofacies maps used in the study of stratigraphic units were subject to more rigorous mathematical analysis in 1956 than in previous years. Paul E. Potter and Raymond Siever, in "A Comparative Study of Upper Chester and Lower Pennsylvanian Stratigraphic Variability," published in the Sept. 1955 issue of the *Journal of Geology*, used statistical methods to describe areal variability of the unit. Tectonic control over large areas and hydrodynamic control over small areas were observed. The reliability of the data was discussed. The technique was considered to have application in determination of environmental contrasts, local contemporaneous tectonism and stability of sedimentation. W. C. Krumbein, in "Statistical Analysis of Facies Maps" in the same publication, showed the application of the analysis of variance to lithofacies maps representing stratigraphic units in which local effects overshadowed regional trends. Paul E. Potter and Raymond Siever, in "Sources of Basal Pennsylvanian Sediments in the Eastern Interior Basin: 1. Crossbedding" in the May 1956 issue of the *Journal of Geology*, presented in this first of three articles the analysis of variance as used to reduce sampling density and to determine the reliability of the sampling.

Articles describing modern sediments included "Macro-invertebrate Assemblages as Indicators of Sedimentary Environments in East Mississippi River Delta Region," by Robert H. Parker, in the Feb. 1956 issue of the *Bulletin* of the American Association of Petroleum Geologists. Sea bottom biological collections and sediment cores were the source of data which enabled the author to recognize seven depositional facies, each with its own fauna. Faunal stratigraphic ranges were such that palaeoenvironments in this and nearby areas were expected to be reliably determined in sediments as old as Miocene. Norman N. Greenman and Rufus J. LeBlanc, in their study "Recent Marine Sediments and Environments of Northwest Gulf of Mexico," which appeared in the May 1956 issue of the *Bulletin* of the American Association of Petroleum Geologists, delineated five major environments of deposition in that basin related to the Pleistocene and Recent geologic history, each with a characteristic sedimentary facies.

Structural Geology.—Geophysical studies of the Atlantic ocean basin and adjoining continental areas were made and interpreted. Charles R. Bentley and J. Lamar Worzel, in "Geophysical Investigations in the Emerged and Submerged Atlantic Coastal Plain. Part x: Continental Slope and Continental Rise South of the Grand Banks," published in the Jan. 1956 issue of the *Bulletin* of the Geological Society of America, stated that in the area studied there were three sedimentary layers with a maximum thickness of 10 km. lying on the subbasement. The subbasement materials showed a gradual change from oceanic areas to continental areas, which indicated that the classic concept of a sharp discontinuity in the earth's crust at the ocean-continent boundary was not valid everywhere. Samuel Katz and Maurice Ewing, in "Seismic-Refraction Measurements in the Atlantic Ocean. Part vii, Atlantic Ocean Basin West of Bermuda," in the April 1956 issue of the *Bulletin* of the Geological Society of America, showed a substantial contrast between oceanic and continental crustal structure in that area. G. Lynn Shurbet and Maurice Ewing in "Gravity Reconnaissance Survey of Puerto Rico," in the April 1956 issue of the *Bulletin* of the

Geological Society of America, related their gravity data to previous work on island arc gravity patterns. Gravity minima on the island were found to be readily correlated with granitic outcrops or with Tertiary sedimentary basins. The largest feature, a gravity maximum, was not correlatable with the surface geology.

(See also MINERALOGY; OCEANOGRAPHY; PALAEONTOLOGY; SEISMOLOGY.) (L. ON.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Face of the Earth* (1953); *Geological Work of Ice* (1935); *The Great Lakes—How They Were Formed* (1951); *Yosemite* (1954); *Ground Water* (1935); *Mountain Building* (1935); *Volcanoes in Action* (1935); *Work of Rivers* (1935); *Work of the Atmosphere* (1935).

Geophysical Year: see INTERNATIONAL GEOPHYSICAL YEAR, 1957-58.

George, Walter Franklin (1878-), U.S. senator who announced his retirement in 1956 after six successive terms in the senate. Born at Preston, Ga., on Jan. 29, he studied at Mercer university, Macon, Ga., and began law practice in 1901 at Vienna, Ga. From 1907 to 1912 he was solicitor general of a Georgia judicial circuit, and from 1912 to 1917 judge of the circuit's superior court. In 1917 he became associate justice of the Georgia supreme court, resigning in 1922 when he was elected to the U.S. senate. He was re-elected in Nov. 1950 for his sixth consecutive term (1951-57).

In 1938 Pres. Franklin D. Roosevelt's attempt to purge George as a reactionary failed when the senator easily won the Democratic nomination over Roosevelt's candidate. Thereafter a prominent member of the anti-New Deal wing of the Democratic party, George frequently criticized government spending, particularly additional appropriations for foreign military and economic assistance.

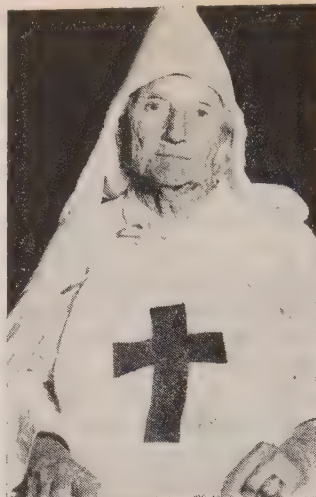
He declared in Aug. 1951 that if European nations "can't stand on their own feet now, there is no use . . . thinking they will do it later."

In the Eisenhower administration, however, George, as chairman of the senate foreign relations committee, became leader of a strong bipartisan foreign policy. After his decision on May 9, 1956, not to run for a seventh senatorial term, George accepted Pres. Dwight D. Eisenhower's appointment as his personal representative and special ambassador for NATO affairs.

Georgia. Georgia, popularly known as the "empire state of the south," is the largest state east of the Mississippi river. It is located in the south Atlantic region of the United States and has an area of 58,876 sq.mi. On July 1, 1956, Georgia had an estimated population of 3,712,000 according to provisional estimates of the U.S. bureau of the census. Of the 1950 population (3,444,578), 54.7% was rural and 45.3% urban; 68.6% was native white and 30.9% Negro. Atlanta, the capital, had a 1950 population of 331,314. Its 1955 estimated population was 469,000.

Other chief cities and their 1950 populations, with their estimated 1955 populations in parentheses, are: Savannah, 119,638 (132,100); Columbus, 79,611 (93,400); Augusta, 71,508 (94,700); and Macon, 70,252 (77,200).

History.—The school segregation problem continued to be the most important problem in the state. The Jan. 1956 session of the state legislature enacted a series of measures designed to maintain the traditional pattern of segregation in the schools of the state. An interposition resolution was passed declaring the U.S. supreme court's segregation decision of May 17, 1954, and all similar decisions, as null, void and of no effect. Another act authorized the governor to close the public schools of any city, county or independent school district by executive order



AGED MEMBER of the Ku Klux Klan attending a recruiting rally held at Macon, Ga., Aug. 4, 1956

whenever such public school could not be operated so as to entitle them to state funds under the laws of Georgia. The act had special reference to previous act enacted in the 1955 session which prohibits payment of state funds to non-segregated schools. Upon the exercise of this power by the governor, each child of school age in the state becomes entitled to an educational grant from state and local funds to enable such a child to obtain an education at a private school. In another act the state legislature gave the cities, counties, municipalities and city and county boards of education an

governing bodies of independent school districts authority to lease school property to private persons including corporations for a term not exceeding five years for private educational purposes.

Other important actions of the Jan. 1956 session of the legislature included: the passage of a controversial libel law which provided that corporations engaged in publishing newspapers, magazines and other periodicals shall be deemed to be domiciled and subject to suit in any county in which the newspaper, magazine or periodical published by such corporation is regularly circulated to more than 50 subscribers; the passage of an act extending absentee voting privileges to spouses and dependents of military personnel; and an act providing that the parent having the custody and control of a minor child under 17 years of age shall be liable for acts of vandalism of such child.

The legislature also proposed an amendment to the state constitution changing the method of amending the constitution by clarifying the requirement of the advertisement of and voting on local amendments. Other important proposed amendments would authorize the legislature to fix the salaries of elective officers provided for in the constitution and would authorize the state supreme court and the state court of appeals to review actions of juvenile courts by direct writ of error without the necessity of a motion for new trial having been made.

Among the more significant political developments of the year was the Democratic senatorial primary in which former governor Herman Talmadge defeated former governor Melville E. Thompson. Talmadge won an overwhelming victory, carrying every one of Georgia's 159 counties. Nomination in the Democratic primary is tantamount to election, since the Republicans were not opposing Talmadge in the general election. Talmadge would succeed veteran senator Walter F. George, who at 78 years of age retired from the U.S. senate to become Pres. Dwight D. Eisenhower's personal representative and special ambassador to the Council of the North Atlantic Treaty organization.

In the Nov. 6, 1956, general election, Georgia, a traditionally Democratic state, gave its 12 electoral votes to Adlai E. Stevenson. Stevenson received 66.3% of the total popular vote, while Pres. Dwight D. Eisenhower polled 33.3% of the total. The Constitution party and scattered write-in votes accounted for the remaining fraction of votes. The Democrats won all of Georgia's 10 seats in the U.S. house of representatives and all state-wide offices as well as the one vacant seat in the U.S. senate.

The principal state officials during 1956 were: governor S. Marvin Griffin; lieutenant governor, Ernest Vandiver; secretary of state, Ben W. Fortson, Jr.; comptroller general, Zach D. Cravey; attorney general, Eugene Cook; treasurer, George B.

Hamilton; commissioner of agriculture, Phil Campbell; commissioner of labour, Ben T. Huie; and superintendent of schools, M. D. Collins.

Education.—During the school year 1955–1956, there were 2,864 public schools in Georgia with an enrolment of 892,467 pupils and a teaching staff of 29,255, according to the state department of education.

There were 1,615 elementary schools, 741 for white children and 874 for Negro children. An additional 1,249 elementary schools had one or more high school grades (including 524 for Negro children). There were 665 five-year high schools (419 for white children and 246 for Negro children). There was an enrolment in the elementary grades of 666,808 (442,514 white children and 224,294 Negro children) and a teaching staff of 19,057 (12,839 white and 6,218 Negro). There was an enrolment in high school grades of 225,659 (166,651 white children and 59,008 Negro children) and a teaching staff of 9,033 (6,763 white and 2,270 Negro). There were 645 nonteaching principals (490 white and 155 Negro).

Total expenditures of the state government for education during the fiscal year ending June 30, 1956, amounted to \$139,917,191, compared with \$122,295,266 the preceding year and \$145,950,000 for the operating budget for the fiscal year beginning July 1, 1956.

Social Insurance and Assistance, Public Welfare and Related Programs.—Public assistance programs during the fiscal year ending June 30, 1956, amounted to \$65,084,889, an increase of approximately 4.6% over the previous year, according to the state department of public welfare. Old-age assistance amounted to \$44,745,096; aid to the blind, \$1,766,706; aid to dependent children, \$13,010,729; and aid to disabled persons, \$5,562,135. In June 1956 a total of 97,708 persons received old-age assistance with an average allowance of \$38.35; 3,440 blind persons received benefits averaging \$43.41; 39,348 dependent children received benefits averaging \$27.00; 11,970 disabled persons received benefits averaging \$42.35.

During the fiscal year ending June 30, 1956, a total of 7,072 persons were convicted of crimes (2,104 of felonies and 4,968 of misdemeanors) and committed to state and county penal institutions under the control of the state board of corrections. There were 8,126 prisoners in these institutions on June 30, 1956, compared with 7,789 on June 30, 1955.

Communications.—As of June 30, 1956, the state highway department reported that there were 88,042 mi. of public roads in Georgia and an estimated additional 7,483 mi. of city streets and alleys. The state highway system extended 15,130 mi. and county roads extended 72,912 mi. For the fiscal year ending June 30, 1956, the state highway department expended \$62,289,817.05. The state received \$12,364,539.16 from the federal government for highway purposes during the fiscal year.

On Dec. 31, 1955, there were 6,284 mi. of operated railroads in Georgia, according to the Interstate Commerce commission. The Georgia Public Service commission reported there were 853,984 telephone stations in the state as of June 30, 1956. There were 4,190 mi. of federal airways and 79 active civil airports in Georgia as of June 30, 1956.

Banking and Finance.—On Dec. 31, 1955, there were 407 operating banks of all types in Georgia with total deposits of \$2,332,554,000 and total assets of \$2,556,606,000, according to the Federal Deposit Insurance Corporation. The same source showed that 298 of these banks were insured state banks with total deposits of \$1,037,392,000 and total assets of \$1,147,857,000. There were 51 national banks in the state with total deposits of \$1,282,343,000 and assets of \$1,392,601,000 as of Dec. 31, 1955.

The Georgia Savings and Loan league reported that there were 82 savings and loan associations on June 30, 1956, of which 75 were chartered by the federal government and 7 by the state. These 82 associations had resources of approximately \$700,000,000.

Total receipts of the state government for the fiscal year ending June 30, 1956, were \$296,514,316; budget allotments for the period were \$281,728,149. On June 30, 1955, the state had a net surplus of \$31,150,825.

Agriculture.—The U.S. department of agriculture estimated that the total

cash income (including government payments) of Georgia farmers for 1955 was \$664,358,000. This represented an increase of 12% from the \$593,136,000 (revised figure) for the previous year. Of the 1955 cash income \$354,938,000 or 53.4% was derived from crops while \$301,048,000 or 45.3% came from livestock and livestock products. Government payments during 1955 amounted to \$8,372,000 or 1.3% of the total cash income.

Manufacturing.—In June 1956 there were 331,100 persons employed in manufacturing industries in Georgia, compared with 330,000 in June 1955, according to the U.S. bureau of labor statistics. The same source reported that gross average weekly earnings of production workers in manufacturing was \$56.74 in June 1956, compared with \$52.93 for June 1955. The Atlanta field office of the U.S. department of commerce reported that manufacturing plants in Georgia in 1955 paid wages and salaries totalling \$999,000,000, third largest amount in the south and 16th greatest in the nation, and \$117,000,000 more than in 1954. The U.S. department of commerce also reported that a value of \$1,594,600,000 was added by manufacture during 1954, compared with \$1,545,467,000 in 1953 and \$1,355,318,000 in 1952. (G. S. Ps.)

Mineral Production.—The tonnage and value of those minerals produced in Georgia in 1953 and 1954 whose value was \$100,000 or more are shown

Table III.—Mineral Production of Georgia

Mineral	1953		1954*	
	Quantity	Value	Quantity	Value
Total		\$51,395,000		\$55,803,000†
Clays	2,651,000	23,455,000	2,711,000	24,111,000
Iron ore	291,000	1,101,000	248,000	872,000
Sand and gravel	2,051,000	1,901,000	2,703,000	2,466,000
Stone	7,122,000	17,756,000	8,058,000	21,384,000
Talc	58,000	203,000	51,000	177,000
Other minerals . . . . .	...	6,979,000	...	7,558,000

*Preliminary. †Total has been adjusted to eliminate duplication in the value of clays and stone.

Source: U.S. Bureau of Mines.

in Table III. Georgia produces a variety of nonmetallic minerals and continued first among the states in output of kaolin or china clay with 70% of the total in 1954. It was second in beryllium output and fourth among the states that sold or used mica. A slight quantity of bauxite also was produced besides some barite, slate and asbestos. It was 31st in rank in value of mineral output with 0.4% of the U.S. total in 1954.

ENCYCLOPEDIA BRITANNICA FILMS.—*Southeastern States*, 2nd ed. (1956).

German Literature. The book season of 1956 produced no best sellers, no sensations nor any major work from the pen of a recognized author. No new talent appeared to nurture the hope of years that German literature might find itself and put an end to the barren period that began with the third reich. No one seemed able to fill the places left during the year by the deaths of the novelists Thomas Mann and Hans Carossa, the poet Gottfried Benn and the dramatist Berthold Brecht.

The most valuable contributions were in the field of philology, in which significant editions of collected works and studies were presented to the public. Made available in eight volumes were Ludwig Thoma's *Gesammelte Werke*, edited by Albrecht Knaus, including many newspaper sketches and articles. Hannah Arendt edited in two volumes the *Essays* of the novelist Hermann Broch, which clearly revealed the author's strong ethical bent that often obscures the aesthetic element. Well received were the diaries of Oskar Loerke, *Tagebücher, 1903–1939*, edited by his close friend the author Hermann Kasack. These diaries, which were not originally written for the public, show the author's physical approach to the intellect and intellectual approach to the physical. Appearing as the second volume in the complete works of Robert Musil, whose 1,000-page novel, *Der Mann ohne Eigenschaften*, won him a lasting place in literary history, was his *Tagebücher, Aphorismen, Essays und Reden*, edited by Adolf Frise.

The works of two young authors, both of whom met a tragic end in Berlin in 1945, were brought to the attention of the public: Felix Hartlaub's *Das Gesamtwerk, die Dichtungen und Tagebücher* and Friedo Lampe's *Das Gesamtwerk*. The detached observations contained in Hartlaub's notes and diaries from the last days of Berlin were by far the best of this genre that had yet appeared. Friedo Lampe, whom the Russians killed when he was unable to prove that he was not an S.S. man, filled his work with the quiet circumstances of everyday life. Delicately, romantically, he enlarged the small, pathetic occurrences of life.

Table I.—Principal Crops of Georgia

Crop	Estimated 1956	1955	Average, 1945–54
Cotton, bales	620,000	701,000	675,000
Corn, bu.	65,064,000	67,080,000	46,942,000
Peanuts, lb.	544,950,000	513,240,000	608,353,000
Tobacco, lb.	127,800,000	147,965,000	116,444,000
Oats, bu.	14,304,000	11,525,000	12,270,000
Pecans, lb.	53,400,000	10,000,000	35,631,000
Potatoes (sweet), bu.	836,000	864,000	1,331,000
Potatoes, Irish, bu.	216,000	272,000	342,000
Hay, tons	784,000	748,000	710,000
Wheat, bu.	2,247,000	1,600,000	2,178,000
Peaches, bu.	1,600,000	*	3,492,000
Soybeans, bu.	780,000	684,000	242,000

*The 1955 peach crop was almost a complete failure because of spring freeze damage. Source: U.S. Department of Agriculture.

Table II.—Principal Industries of Georgia

Industry	All employees		Salaries and wages		Value added by manufacture	
	1954	1954 (in 000s)	1954	1954 (in 000s)	1953 (in 000s)	1953 (in 000s)
Food and kindred products	35,992	\$106,113	\$265,065	\$219,382		
Textile mill products	102,681	250,277	382,153	410,587		
Apparel and related products	36,468	76,597	118,485	115,447		
Lumber and wood products	32,072	59,950	100,974			
Furniture and fixtures	7,037	18,593	33,481	39,694		
Pulp, paper, and products	13,744	55,084	150,705	128,969		
Chemicals and products	10,086	29,748	80,295	77,121		
Leather and leather products	2,492	6,192	11,507	9,836		
Stone, clay, and glass products	7,640	22,399	44,607	42,792		
Primary metal industries	2,657	10,887	14,582	...		
Fabricated metal products	5,482	17,962	29,416	...		
Machinery (except electrical)	7,098	25,027	43,710	37,948		
Electrical machinery	2,433	9,345	17,834	...		
Miscellaneous manufactures	3,714	10,205	21,807	21,101		

Source: U.S. Department of Commerce, 1954 Census of Manufactures, preliminary report.

Benno von Wiese's study, *Die deutsche Novelle von Goethe bis Kafka*, provided searching individual philosophical interpretations of the most important novellas in the period covered. Almost lost among the myriad titles of the many pocket-book series was the convincing interpretation of the life and works of the dramatist Grillparzer, in a book of the same name by Walter Naumann.

A revised and enlarged second edition of the four-volume biographical collection *Die Grossen Deutschen*, which numbered among its contributors Theodor Heuss, the president of the Bundesrepublik, led the list of important biographical works of the year. Shortly after the death of Thomas Mann his daughters, Monika and Erika, published studies centred around their famous father. *Vergangenes und Gegenwärtiges*, *Erinnerungen* by the former was a more general study of the life led by the Mann family as she saw it; whereas *Daz letzte Jahr*, *Bericht über meinen Vater* by the latter concentrated heavily on the last year of the celebrated author's life. In his *Ludens*, *Erinnerungen und Versuche* the nonagenarian Emil Strauss, who secured for himself a place in literary history though never enjoying wide public acclaim, presents the fragment of an earlier autobiography as well as several previously unpublished works and fragments. This friend and early colleague of Gerhart Hauptmann proved himself in this book to be a realist with a romantic tendency for the homely. His ascetic but very vital personality comes strongly to the fore, especially in the details of his early home life and in the biographical sketch of his grandmother. Almost more a work of philosophy than of biography is Karl Jasper's study of the Romantic philosopher: *Schelling—Grösse und Verhängnis*. In this work Jasper, the most outstanding living German existentialist philosopher, produced a definitive work concerning the life and philosophy of this first existentialist.

There were several outstanding new publications in the field of lyric poetry, where it seemed that creative German talent might accomplish something original and significant. The collected poems, *Gesammelte Gedichte*, of Gottfried Benn presented a graphic curve of the German lyric in its many moods and styles from World War I to the present. Rescued from a threatened oblivion were the collected poems, *Das Lyrische Werk*, of Gertrud Kolmar (Gertrud Chodziesner). This Jewish poetess, who disappeared in the blackness of the concentration camps, was being hailed as one of Germany's greatest, far superior to the talented Else Lasker-Schüler. Filled with a love for her Prussian landscape, she sings of its beauties, its flora and fauna. In her love poems too she combined a charming naïve realism with fairy-talelike overtones. The finest lyric poems of the year were contained in the small volume *Botschaften des Regens* by Günter Eich, Germany's most promising young poet.

In the post World War II period the German novella had been, usually, more successfully handled than the novel. In 1956 one of the outstanding new novellas was *Die Frau des Pilatus* by the aged Catholic writer Gertrud von Le Fort. Using as her source the only biblical reference (Matthew xxvii, 19) to Pilate's wife, the author created a masterpiece which illustrates her favourite, oft-treated theme that woman by her very nature is destined to be the leading bearer of the Christian attitude in order to lessen the severities of masculine actions and worldly might. An established master of the novella, Werner Bergengruen, further justified his place in German letters with *Das Netz*, a story of an unfaithful wife who is miraculously saved from punishment. Heinrich Böll in his "cheerful stories," *Unberechenbare Gäste*, again demonstrated that he had no superior when it came to treating the tragi-comic in everyday life. The fourth short story collection of Kurt Kusenberg, *Wein auf Lebenszeit*, appeared to rank with his earlier ones. His elegantly written surrealistic tales in his peculiar style, like that of the Grimm

brothers, had a slight tinge of melancholy while still showing respect for the bounds of reality.

The novels in 1956 which earned the best critical treatment were written by comparatively unknown authors. Hans Erich Nossack in his *Spätestens in November* told the old story of the eternal triangle, but the complex yet real psychological characterizations of the people involved lifted the novel onto the artistic level. Still fairly infrequent in German literature was the talented humorist. Thaddäus Troll, already distinguished as a *Kabarettist* and *Feuilletonist*, produced a very lighthearted first novel, *Sehnsucht nach Nebudistan*, written with a delightful touch of wit, irony and humour. *Kein Quartier in Träumen*, the adventures of a 17-year-old girl refugee in western Germany with typical situations of present-day life, was a distinguished first work of Hans Bachmüller. Maria Mathi's *Wenn nur der Sperber nicht kommt* traced the lives of a Jewish family in a small German city from the period of Wilhelm II through the days of the third reich, and succeeded in presenting real characters and their destinies.

Although the German dramatic literature and the stage were overrun with translations, especially French and American, several German originals are worth mentioning. Friedrich Dürrenmatt, a Swiss writer, had two successes during the season: *Griechen sucht Griechin*, a gay spirited comedy of the want-ad marriage of a middle-class worker with a well-known—but not to him—courtesan, filled with satirical stabs at modern business and its social life; and *Besuch einer reichen Dame*, satirical in its far-fetched plot and biting in its condemnation of personal and social cruelty as pictured in the successful return of a wealthy woman to her small home town where she had been meanly treated. Hans Henny Jahn, winner of the 1956 Lessing prize, awarded by the city of Hamburg, was represented by the play *Thomas Chatterton*. The author's strong social sympathies were, as usual, plainly in evidence.

Characteristic of contemporary life was the attention given to the problem of modern man's health in its relation to his technologically dominated daily life. Friedrich Deich, a psychiatrist, sought to give his views of the problem in his well-received novel *Windarzt und Apfelsinenpfarrer*. In *Gesundheit und technische Welt* Joachim Bodamer felt that the "technologizing" of the world brings with it a disregard for the living of a normal life and a concern for the functioning of man in the mass.

The eminent medical author Victor von Weizsäcker, in his book *Pathosophie*, or "Medical Anthropology," developed a completely new idea of disease. To him it is the means of directing lives, for illness is the striving for final redemption, the effect of "unlived life." The farther man is from his goal, the sicker he is; but the farther away he is, the greater his urge for the goal.

Hannah Arendt's study of totalitarian government as it affects the individual, *Elemente und Ursprünge totaler Herrschaft*, was drawn mainly on the basis of Nazi Germany from 1930 and Soviet Russia from 1930. *Denk ich an Deutschland*, a word and picture commentary, was the closest thing to a sensation—though not because of sales—during the year. Its purpose was to point up evil conditions in west Germany, ostensibly to show how the German leaders lost the chances of 1945 to start with a clean slate. The book contains frightful generalizations and looks exclusively on the bad side of the picture. However, it attracted much publicity.

Literature in the German Democratic Republic continued to consist predominantly of translations from the U.S.S.R. and the satellite countries. Not one significant work appeared from the pens of such leading east zone writers as Anna Seghers, Berthold Brecht, Arnold Zweig and Ludwig Renn. Nor did any new writer

succeed in publishing a book of sufficient literary merit to attract attention in the west. (J. C. OR.)

Germany. A country of central Europe, Germany is bounded north by the North sea, Denmark and the Baltic sea, east by Poland, south by Czechoslovakia, Austria and Switzerland, and west by France, Luxembourg, Belgium and the Netherlands. From 1949 Germany was partitioned into two republics with a special provisional regime for Berlin (*q.v.*). Areas and populations of the two states and Berlin are as follows:

	Area (sq.mi.)	Population (1950 census)	(1955 est.)
German Federal Republic	94,905*	47,695,672*	49,995,000
Western Berlin	186	2,146,952	2,100,000
German Democratic Republic	41,380	17,313,734†	16,500,000
Eastern Berlin	155	1,175,979†	1,200,000
	136,626	68,332,337	69,795,000

*Excluding the Saar (*q.v.*): area, 991 sq.mi.; pop. (1955 est.) 996,000. †1946 census.

Language: German, with small admixture of Lusatian (260,000 in the Kottbus-Bautzen area), Polish (150,000, mainly in Westphalia) and Danish (120,000). Religion: (1938 est.) Protestant 62.7%, Roman Catholic 32.5%, Jewish 0.7%, other 4.1%; (1950 census, Federal Republic only) Protestant 52.2%, Roman Catholic 43.8%.

German Federal Republic.—Capital, Bonn (pop., 1953 est., 30,000). Chief cities (with populations of more than 200,000, 1953 est.): Hamburg 1,722,819; Munich 906,497; Cologne 670,091; Essen 660,934; Frankfurt 601,747; Düsseldorf 594,841; Dortmund 580,892; Stuttgart 566,009; Hanover 494,527; Bremen 483,539; Duisburg 454,899; Nuremberg 398,701; Wuppertal 392,804; Gelsenkirchen 355,320; Bochum 326,070; Mannheim 272,304; Kiel 259,462; Wiesbaden 239,961; Brunswick 136,975; Lübeck 230,144; Oberhausen 226,954; Karlsruhe 211,056. President of the republic in 1956, Theodor Heuss; federal chancellor, Konrad Adenauer (*q.v.*).

German Democratic Republic.—Capital, Berlin-Pankow. Chief cities (1953 est.): Leipzig 607,700; Dresden 510,100; Chemnitz (renamed Karl-Marxstadt) 298,500; Halle 278,400; Magdeburg 252,300. President of the republic in 1956, Wilhelm Pieck; premier, Otto Grotewohl. Soviet ambassador, Gheorgy M. Pushkin. Soviet commander in chief, Col. Gen. Andrey A. Grechko.

History.—During 1956 no progress was made toward reunifying Germany. The Soviet Union and the German Democratic Republic remained firm in their demand that Germany should be unified by stages and that the first stage should be all-German talks on reunification. On March 1 the Soviet government proposed to the government of the German Federal Republic the immediate holding of such talks. The proposal was rejected on March 2. On March 5 the (western German) Free Democratic party suggested that the German Federal Republic should withdraw from NATO (the North Atlantic Treaty organization) and leave the German Democratic Republic from the Warsaw treaty in order to hasten a settlement of the German reunification problem. This suggestion was rejected by the Bonn government and ignored by the Soviet Union.

On May 10 another effort was made to break the deadlock, by Sir Winston Churchill, who was receiving the Charlemagne peace prize at Aachen. He proposed the admission, at some future date, to NATO of the Soviet Union. This could pave the way to the creation of a larger European community in which the satellite states also would be given their places. The federal foreign minister, Heinrich von Brentano, rejected this idea when he stated on May 11 that it was far too soon to talk of a "new Russia," ready to co-operate with the western democracies.

On June 9, N. A. Bulganin, Soviet premier, once more advised, by a note to federal chancellor Konrad Adenauer, all-German talks on reunification. On July 22 Adenauer wrote in answer that



MODERN CHURCH completed in 1956 in western Berlin, Ger.

a Germany reunified on the basis of free elections would in no way constitute a menace to Soviet security.

Political pressure at home resulted in Adenauer making one more effort in 1956 to reach agreement with the Soviet Union. On Sept. 7 the Federal Republic ambassador in Moscow, Wilhelm Haas, handed a note to the Soviet government. It asked for bilateral Soviet-German discussions before any conference of the great powers on Germany took place; reunification on the basis of free, all-German elections and the creation of a demilitarized zone in central Europe. The Soviet deputy foreign minister, Andrei Gromyko, told Haas that "rearmament and the suppression of freedom in the German Federal Republic" made reunification impossible at present. On Oct. 23 the official Soviet answer rejected Adenauer's approach and once more called for all-German talks. Under the circumstances the celebration of a Day of National Unity on June 17, 1956, was a somewhat empty gesture.

German Federal Republic.—Probably the most important single event of the year was the final settlement of the Saar problem, which was reached by Adenauer and Guy Mollet, the French premier, on Sept. 29. By this agreement the amounts of coal which France could take out of the Saar or buy at cost price were fixed, financial contributions to the building of the Moselle canal were settled and the decision was made to change the Saar's currency from the franc to the deutschmark within two years. The Saar would become politically part of Germany on Jan. 1, 1957, and would be integrated economically in the German Federal Republic by Jan. 1, 1960. (*See SAAR.*)

Adenauer's coalition difficulties continued during the year, with demands by various parties for the reduction in numbers of his cabinet. On Oct. 7 the four ministers who belonged to the Free Democratic party resigned and on Oct. 16 two of them were reinstated when the cabinet reshuffle had been completed. Hermann Schaefer (Bavarian Social Christian), Fritz Neumayer



SUPPORT FOR SOVIET TROOPS in the German Democratic Republic is provided by the approximately 500,000 members of societies for "sport and technology," such as the group shown in the photograph marching in Leipzig in 1956

(F.V.P.) and Waldemar Kraft (Refugee party) left the cabinet. Theodor Blank, minister of defense, was replaced by Franz Josef Strauss and the latter's ministry of atomic affairs would be taken over in 1957 by Siegfried Balke, minister of posts. Balke's ministry would then be given to Ernst Lemmer, chairman of the C.D.U. in western Berlin.

Toward the end of the year further indications for next year's general election were provided by local elections in five *Länder*. Elections held in North Rhine-Westphalia, Lower Saxony and Hesse on Oct. 28 showed that the S.P.D. was, at least temporarily, the strongest party in the German Federal Republic. In these three *Länder* it gained about 10% more votes than in the previous local elections of 1952. In Baden-Württemberg the S.P.D. gained 8% more votes than in 1952, and in the Rhine-Palatinate 6% more. In all *Länder* the C.D.U. maintained its 1952 vote, while the Free Democrats lost about 3% on the average. It seemed likely that only the three leading parties were likely to poll more than 5% in the 1957 election, and thereby return members to parliament.

Foreign policy absorbed much of Adenauer's time and provided matter for a full-scale *Bundestag* debate on June 29. The government majority on that occasion was 85, with 220 voting for the government and 135 against. On June 28 foreign minister Von Brentano had made a statement of policy that minor differences with the western powers were to be cleared up; NATO was to be strengthened; developments in the Soviet Union and satellite states would be closely observed; and every effort would be made to secure German reunification. The problem of support costs for Allied troops on German soil was settled on June 29, after a four-month negotiation. The German Federal Republic agreed to pay £125,000,000 during the current NATO year, £34,000,000 of this sum to go to the United Kingdom.

In accordance with treaty obligations, the German Federal Republic continued to organize its new armed forces. On March 6 the Soldiers' law for the raising of 150,000 volunteers was approved by the *Bundestag*, and by the end of the year approximately 70,000 men were in uniform. The S.P.D. and Free Democrats continued to oppose the early introduction of conscription. On Sept. 27 the call-up period was reduced from 18 months to 12 months.

A minor triumph was the treaty of friendship signed with Belgium on Sept. 24, under which several small areas annexed by Belgium in 1949 were to be returned to German sovereignty. Less fortunate was Von Brentano when, speaking in London on May 2 on the subject of the Oder-Neisse frontier, he said that

Germany might have to make concessions over this frontier, in order to regain unity. He was bitterly criticized by refugee organizations which staged demonstrations later in the month. No real progress was made in relations with the Soviet Union although Valerian Zorin presented his credentials as Soviet ambassador in Bonn on Jan. 8, and a federal German embassy was established in Moscow on March 1. During the year Zorin protested against the "detention" of Soviet citizens in the German Federal Republic (they turned out to be criminals and lunatics) and the launching of propaganda balloons from German soil, and was withdrawn on July 14. He was replaced in October.

Steady economic progress was made throughout 1956, although German industry had begun to suffer from the effects of the blocking of the Suez canal by the end of the year. On March 1 the Bank of the German *Länder* followed the British example by imposing a modest credit squeeze and raised the bank rate from 3½% to 4½%. On May 18 it raised the bank rate to 5½% and this step was surprisingly criticized by Adenauer in a speech to the Federation of German Industries in Cologne. In June motor car production achieved a new record, with 96,700 vehicles in one month, and unemployment at the beginning of September dropped to its lowest post-World War II figure of 409,427. On Sept. 5 it was possible to reduce the bank rate to 5% and on Sept. 17 all restrictions were removed on the amount of currency carried by Germans travelling abroad.

Other events included the banning of the German Communist party on Aug. 17, the arrival of several contingents of German repatriates from Poland, severe summer floods on the Weser and other central German rivers and the formation on June 17 of the German Social Union party led by Otto Strasser, a former follower and later opponent of Adolf Hitler. On Nov. 12 the trial began in Karlsruhe of Otto John, the former head of the Office for the Protection of the Federal Constitution, who disappeared into the German Democratic Republic on July 20, 1954, and returned to the German Federal Republic on Dec. 5, 1955.

German Democratic Republic.—The German Democratic Republic suffered none of the serious disturbances which affected other Communist satellite states. This could be attributed mainly to the presence of 22 Soviet army divisions on German soil and to memories of the unsuccessful uprising of June 1953. Only during the latter part of 1956 were there any signs of unrest. There were stoppages of work in four Magdeburg factories, and in factories in Erfurt and Chemnitz, in mid-October; some minor demonstrations by university students in Dresden; and sharp and pertinent demands for more information at "discussion group evenings" organized in November by the ruling Socialist Union party (S.E.D.).

Politically, the government attempted to suggest a growing independence and further "softening" of its policies. On March 23 deputy premier Walter Ulbricht promised a milder political climate, closer contact with the western German Social Democrats, increased trade with the western world and a rise in the standard of living. He stated that food rationing would be abolished sometime in 1957, that there would be better entertainments, that production of consumer goods would be stepped up by 40% and that rates of pay would be raised after examination. Ulbricht reiterated these promises on Aug. 1, when he was forced to admit that the second five-year plan, approved by the People's chamber on March 30, was already "814,000,000 DM. in arrears." On March 28 Otto Grotewohl declaimed against the injustices of the legal system and on June 21 he announced that more than 20,000 political prisoners had been released over a three-month period.

The eastern German leaders also attempted to suggest their increased independence from Moscow and emancipation from Stalinist dogma. On March 4 Ulbricht announced the benefits of

a political collective, as opposed to Communist dictatorship. He claimed that such a collective had already been functioning for years in the German Democratic Republic. On March 18 he revealed Stalin's "serious failures," in particular as a wartime commander in chief and because he refused to be forewarned of Nazi aggression. Toward the end of the year various leaders began to preach "the German way to true Socialism."

Foreign policies remained tied to those of Moscow. On Jan. 28 the German Democratic Republic was formally accepted into the Warsaw defense treaty. On May 29 Grotewohl appealed for an "all-German plan to secure German reunification." On July 17 his government reached agreement with that of the Soviet Union in demanding all-German talks, reducing Soviet occupation costs to 800,000,000 DM. a year and agreeing on the general principle of increased Soviet economic aid. As a member of the Warsaw treaty, the German Democratic Republic was given a regular army by converting the people's police into armed forces. About 30,000 of the people's police had been enrolled as soldiers and were organized in seven divisions. Between Jan. 22 and 25 two divisions carried out atomic manoeuvres in the Weisswasser district. In agreement with the Soviet Union, steady progress was made in establishing an atomic research centre on the outskirts of Dresden.

In spite of its fine promises the regime remained a repressive one. On Jan. 16, 30 members of the Evangelical Church railway missions were arrested for alleged spying. A number of the missions were closed down. The Free German Youth continued to propagate pagan "youth initiation" in place of church confirmation but in June it was learned that its campaign had failed for the second year in succession.

Other events of interest were the meeting of the western German Free Democratic party and eastern German Liberals (L.D.P.) leaders in Weimar on Oct. 6; the successful trade mission to the middle east in May; and the efforts of the government to stop Radio Free Europe propaganda balloons from flying over the German Democratic Republic's territory.

The government was extremely perturbed by events in Poland and Hungary at the end of October. The People's chamber postponed its sittings and failed to hear any proper account of the visit of its delegation to Warsaw. The para-military "factory guards" and "societies for sports and technics" were alerted and armed through some towns. The armed forces, including most Soviet army divisions, were also alerted. The government took its line from Moscow regarding Hungary, where "counter-revolutionaries" had attacked the state, and Poland, where Stalinist mistakes had necessitated a change of regime.

(See also BERLIN; GERMAN LITERATURE; NORTH ATLANTIC TREATY ORGANIZATION; UNION OF SOVIET SOCIALIST REPUBLICS.)
(T. PE.)

Education.—*German Federal Republic.*—Schools (May 1955), excluding Hamburg and Bremen: primary 29,465, pupils 4,636,470, teachers 158,053; higher primary 806, pupils 323,409, teachers 13,828; secondary 1,572, pupils 775,320, teachers 41,532; all-age schools (Schleswig-Holstein, Hamburg and Bremen) 487, pupils 299,633, teachers 10,135; vocational, including 7 higher technical institutes (Nov. 1954), 7,866, pupils 2,441,744, teachers 70,574; teacher training (Nov. 1954) 84, students 13,187; universities 17, students (1955) 88,336, teaching staff (1953) 4,908; other institutions of higher education (1955) 29, students 23,260, teaching staff (1953) 1,839. Music, art and physical training colleges (1955) 9, students 5,087.

German Democratic Republic.—Schools (1950): primary 10,900, pupils 1,440,000; secondary 560, pupils 233,000. Institutions of higher education (1955) 46, including 6 universities, students 57,500.

Finance and Banking.—*German Federal Republic.*—Monetary unit: Deutschmark, with an exchange rate of 4.16 DM. to the U.S. dollar. Budget (1955-56 closed account) revenue 32,761,000,000 DM., expenditure 29,788,000,000 DM.; (1956-57 estimate) balanced at 35,022,000,000 DM. Internal debt (March 1955) 10,699,000,000 DM.; external debt 9,432,000,000 DM. Currency circulation (Dec. 1954) 12,780,000,000 DM., (Dec. 1955) 14,090,000,000 DM. Deposit money (Dec. 1954) 13,630,000,000 DM., (Dec. 1955) 14,980,000,000 DM. Gold and foreign exchange, official holdings (Dec. 1954) U.S. \$2,682,000,000, (Dec. 1955) U.S. \$3,121,000,000.

German Democratic Republic.—Monetary unit: Deutschmark with an official exchange rate, high and fictitious, of 45 U.S. cents. In western Berlin

the average free exchange rate in 1956 was 1 westmark=4.80 ostmarks. Budget (ostmarks, 1954 actual; 1955 est. in parentheses): revenue 36,220,200,000 ost. (38,166,900,000 ost.), expenditure 36,142,900,000 ost. (38,138,100,000 ost.).

Foreign Trade.—*German Federal Republic.*—(1955) Imports 24,357,000,000 DM.; exports 25,677,000,000 DM. Main sources of imports: continental E.P.U. (European Payments union countries) 43%; U.S. and Canada 15%; Latin America 11%; U.K. 4%; other sterling area 11%. Main destinations of exports: continental E.P.U. 57%; Latin America 8%; U.S. and Canada 7%; U.K. 4%; other sterling area 9%. Chief exports (1954): motor vehicles 8.3%; electrical machinery 7.6%. Chief imports: raw cotton and cotton products 5.6%; wheat 5.4%.

German Democratic Republic.—(UN Economic Commission for Europe's estimates, in U.S. dollars, 1954.) Trade turnover with all countries: \$2,630,000,000, including \$1,960,000,000 with the countries of the Communist group.

Transport and Communications.—*German Federal Republic.*—Railways (1954) 35,247 km.; passenger-km. (1954) 33,207,000,000; freight, ton-km. (1955) 58,068,000,000. Roads (March 1955): classified 129,238 km., including 2,148 km. of *Autobahnen*; local (unclassified) approximately 120,000 km. Motor vehicles in use (Jan. 1956): cars 1,620,000; commercial vehicles 967,400. Shipping (July 1954): merchant vessels of 100 gross tons and over 1,895; total tonnage 2,652,738. Cargo in western German ports in external trade (metric tons, 1955): loaded 15,360,000; unloaded 35,280,000. Navigable inland waterways (1953) 4,259 km. Telephones (including west Berlin, Jan. 1955) 3,685,950. Radio receivers (Jan. 1955) 12,284,434.

German Democratic Republic.—Railways (1951): 14,400 km. Roads (1950): 54,900 km. Telephones (1951): 332,200. Radio receiving sets (1952): 3,400,000.

Agriculture.—*German Federal Republic.*—Production (metric tons, 1955; 1954 in parentheses): wheat 3,378,000 (2,893,000); rye 3,498,000 (4,100,000); barley 2,079,000 (1,920,000); oats 2,478,000 (2,473,000); potatoes 22,874,000 (26,769,000); milk 16,908,000; butter (from factories) 290,400; cheese (from factories) 154,800; beef and veal 734,000; mutton and lamb 24,000; pork 1,326,000; beet sugar (raw value) 1,300,000; wine 2,210,000 hl. Livestock (Dec. 1955): cattle 11,552,500; pigs 14,593,300; sheep 1,188,000; horses 1,098,500; chickens 52,301,900. Fish landings (1955) 751,300 metric tons.

German Democratic Republic.—Main crops (metric tons, 1934-38; latest estimates in parentheses): wheat 1,553,000 (1955, 1,300,000); rye 2,070,000 (1955, 2,500,000); barley 1,028,000 (1955, 1,200,000); oats 1,587,000 (1955, 1,600,000); potatoes 13,649,000 (1954, 16,753,000); sugar beets 5,467,000 (1954, 5,195,000). Livestock (1938; 1954 in parentheses): cattle 3,647,000 (3,793,000); pigs 5,707,000 (8,367,000); sheep 1,771,000 (1,712,000); horses 811,000 (695,000).

Industry.—*German Federal Republic.*—Fuel and power (metric tons, 1955): coal 130,728,000; lignite 90,360,000; crude oil 3,144,000; coke 43,584,000; electricity 75,780,000,000 kw.hr.; manufactured gas 20,868,000,000 cu.m. Production (metric tons, 1955): iron ore (metal content 30%) 11,376,000; pig iron 16,488,000; crude steel 21,336,000; zinc 195,720; copper 253,560; lead 107,640; aluminum 230,280; cement 18,768,000; cotton yarn 372,720; woven cotton fabrics 259,200; wool yarn 114,600; rayon filament yarn 68,640; rayon staple fibre 148,800; potash (K₂O content) 2,019,719; passenger cars (units, 1955) 705,480; commercial vehicles (units, 1955) 203,160. New dwelling units completed (1954) 542,400. Merchant vessels launched (100 gross tons and over, 1955) 926,800 gross tons. Index of production (Feb. 1956; 1953=100) 130. Index of employment (Sept. 1955; 1953=100) 117.

German Democratic Republic.—Production (metric tons, 1936; 1955 in parentheses): coal 3,525,000 (3,500,000); lignite 101,100,000 (200,000,000); liquid fuel, synthetic 500,000 (1,575,000); electricity 13,900,000,000 kw.hr. (28,750,000,000 kw.hr.); iron ore 300,000 (1,700,000); pig iron 200,000 (1,520,000); steel 1,200,000 (2,500,000); potash salt 1,000,000 (1,571,000); cement 1,700,000 (2,950,000); sulphuric acid 302,000 (483,000); synthetic rubber (1955) 70,000; natural yarns, excluding synthetic fibres 213,000 (250,000); textiles, excluding cloth for sacks and rough-yarn cloths (1955) 505,000,000 sq.m.; leather shoes 15,000,000 (18,000,000) pairs; sugar 618,000 (1954; 733,000).

ENCYCLOPÆDIA BRITANNICA FILMS.—*Germany* (1955).

Gerontology. Perhaps most interesting to all gerontologists during 1956 were the investigations to find out if an increase in the fatlike substance cholesterol in the blood produces disease of the arteries, with a plugging up of these vessels and the production of heart attacks or little strokes.

If blood cholesterol is the offender, how does it work? Why does it pile up in the blood of some persons? Why does it rarely pile up in the blood of others, as for example the Chinese? By measuring some fraction of the fat in the blood of a person, can it be determined what chance he has of getting a heart attack? What can be done to protect those who now have a high blood cholesterol titre?

The answers were being sought by men such as John Gofman, who was studying certain fractions of the blood fats, and Ancel Keys, who was travelling about the world studying the blood cholesterol titres of people such as the Italians, who live mainly on starches, and the Japanese, who eat little fat.

Next in importance might be the work of a number of men who were studying the retirement plans of many companies, the satis-



JAVIER PEREIRA, reported to be 167 years old, arriving at Miami, Fla., in Aug. 1956. The 4 ft. 4 in. Colombian Indian was brought to the U.S. to be studied by longevity investigators

factions and dissatisfactions of retirement, the possibilities of finding work for many retired persons and the problem of finding a good place for retirement.

Howard Rusk and his coworkers had done excellent work in showing that experts can go into a hospital for forgotten old persons and get 97 out of 100 of them out of bed. Some can be taught to walk, some to use crutches and some to get into a wheel chair. They can be taught to get up and take care of themselves and go to meals at table. Some can even be taught to do work that will bring in money.

Surgeons were doing hopeful work in transplanting short segments of artery to replace segments in which the vessel has almost plugged up because of disease. As a result, a man who has been in a wheel chair with weakened and painful legs and the threat of gangrene may get up and take a job as a postman. Artery banks were being established for the helping of such persons.

(W. C. Az.)

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Ghana: see GOLD COAST.

G.I. Bill: see VETERANS ADMINISTRATION (U.S.).

Gibraltar. A British fortress colony, city and port, Gibraltar lies on a peninsula from the southwest coast of Spain at the western entrance to the Mediterranean. Area: 2 sq.mi. Pop., excluding armed forces (1951 census) 21,314; (1954 est.) 25,000, mainly of Italian origin. Language: English and Spanish. Religion: mainly Roman Catholic. Governor in 1956: Lieut. Gen. Sir Harold Redman.

History.—Although the restrictions imposed by the Spanish

government in 1954 on the free flow of goods, visitors and labour across the Spanish frontier continued, trade and finances of the colony improved in 1956. A government scheme to build 300 flats over a period of five years at a cost of £1,000 was started. Plans for port development and a new airport terminal building were prepared. New hotel accommodations were being built to cope with the rapid increase in the number of tourists.

The political situation was quiet. The constitution was amended to provide for a majority of elected members in the legislative council and for an equal number of official and unofficial members on the executive council. At the elections held in September, four members of a Labour party, the Association for Advancement of Civil Rights, and three centre and right-wing candidates were returned to office.

(J. D. B.)

Education.—Schools (1954): primary 18, pupils 2,949; secondary (including technical) 6, pupils 1,188.

Finance and Trade.—Currency: sterling, with local notes. Budget (actual): revenue £1,054,345; expenditure £1,001,115. Foreign trade (including bunkers, 1955): imports £5,370,000; exports £1,420,000.

Gilbert and Ellice Islands Colony: see PACIFIC ISLANDS, BRITISH.

Girl Scouts: see SOCIETIES AND ASSOCIATIONS, U.S.

Glands: see ENDOCRINOLOGY.

Glass. Production and sales of the United States glass industry continued high during 1956. More than 10,000,000 glass containers were made during the first six months of the year, an increase of 4% over the same period in 1955. In the flat glass field, slackening of demand for windshields resulting from the drop in automobile production was offset by increased requirements for building construction and home furnishings. Employment was about 30,000 in the flat glass industry. More than 700,000,000 tumblers and 400,000,000 pieces of table kitchen and household glassware were manufactured and sold during the year.

Glass Container Industry Statistics, U.S.

Year	1956*	1955	1954	1953
Shipments	138,518†	137,228	124,649	127,516
Production	141,367†	138,470	126,898	128,892

*Total for the 12 months ending July 1, 1956.

†Thousands of gross, figures released by Bureau of the Census, U.S. Department of Commerce.

New products made of glass and glass fibres appeared on the market. A heat protective suit of glass fibre fabric, coated with a thin layer of aluminum, enables a man to stay up to two to three minutes in a furnace at 1,200° F. Fiberfrax, a refractory aluminum silicate glass fibre, may be used for insulating furnaces up to 2,300° F. Fibre glass reinforced plastic panels, pipe, padded automotive instrument panels and new sound absorbing insulation appeared along with fibre glass bows, fishing rods, boats and golf club shafts. Solderglass, a superalloy of lead, aluminum, zinc borosilicate, was developed for sealing joints of ordinary glass together to make such things as double paned windows and colour television tubes. Silicone treatment of bottles prevents abrasion of the surface and maintains strength for a greatly extended service life. Precision bore tubing, shaped by a vacuum process on a stainless steel mandrel, was another new development in the glass field.

In the field of artistic glass, a series of 36 crystal shapes engraved from drawings by leading contemporary artists of the near east and far east was produced by Steuben Glass, Inc., entitled "Asian Artists in Crystal." The collection was the result of an unusual form of co-operation between artists of the east and craftsmen of the west.

The fourth International Congress on Glass met in Paris, during the first week of July. Nearly 400 delegates from more than 20 nations were in attendance. A total of 53 papers were

presented, which discussed new types of glasses, the reactions by which glass is made from its raw materials, the behaviour of glass during manufacture, physical properties and control of glassmaking, the structure of glass and the effect of radiations on glass. (C. H. G.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Glass* (from the old to the new through research) (1954).

Gliding. Fifty-eight pilots from 25 countries attended the world gliding championship contest at St. Yan, Fr., June 30 to July 7, 1956. Paul B. MacCreedy, Jr., of the United States won the title of world champion, flying a Breguet 901. Second place went to S. Juez of Spain, flying a Sky, and third place was earned by W. Gorzelak of Poland, flying a Jaskolka. First place in the two-place category went to H. N. Goodhart and F. Foster of Great Britain, flying a Slingsby Eagle.

The international records established in 1956 were: a 300-km. triangular course record of 47.162 m.p.h. by G. A. Goodhart on Jan. 9 in an LO-150; a goal record of 416 mi. by R. Fonteilles on May 13, in a Breguet 901; a feminine record goal flight of 356 mi. on Aug. 10 in a Jaskolka by Mme. Majewska.

Several national records were established in 1956. In Belgium, Mme. Debauche flew a Spalinger on May 15 for a feminine distance record of 65 mi., and J. d'Otreppe set a goal and return record of 149 mi. Four British records were set away from Great Britain: G. A. Goodhart, flying an LO-150, set a goal and return record of 205 mi. on Jan. 9 in Australia; H. N. Goodhart, brother of G. A. Goodhart, and F. Foster set a two-place goal and return record of 141 mi. in a T-42B on June 27 in France; P. A. Wills set a speed record of 33.3 m.p.h. for the 200-km. triangular course on June 28 in the Skylark III in France. In France, P. Lepanse set a speed record on April 23 of 40.4 m.p.h. for the 200-km. triangular course in a Breguet 901; B. Costa and W. Pratt set a 258-mi. goal record for two-place gliders in a Ka-2b Rhonschwalbe on May 13; and on Aug. 21 a goal and return flight of 175 mi. constituted a two-place record by M. Simeoni and M. Fontaine.

In the United States the following records were established: a speed record of 43.94 m.p.h. for the 300-km. triangular course by P. Bikle on July 21 in a Schweizer 1-23; a 340.52-mi. goal flight by L. Maxey on August 1; a 248.07-mi. two-place record on Aug. 4 by H. Hutchinson and B. Denison; 217.04-mi. goal and return two-place record on Aug. 8, and a speed record of 41.023 m.p.h. for the 100-km. triangular course on Aug. 9, by H. Hutchinson and E. Hoggard both in an LK-10A.

The following new sailplanes were designed and built during 1956: in Canada the BKB-1, a flying wing designed by B. K. Bodok; in Germany the LO-150, a high-performance sailplane designed by A. Vogt; in Italy the Vergiate Sailflying Sports section of the SIAI-Marchetti company designed the high-performance sailplane the EOLO 3 V-1; in Finland the PIK-3, a high-performance sailplane was designed by L. Norrmen and I. Louname; in Switzerland A. Markwalder designed the Elfe M, a high-performance sailplane; in the United States W. G. Briegleb designed the BG-12, a high-performance sailplane, and D. S. Mitchell produced the high-performance sailplane, Nimbus III.

The 1956 national championship contest in Belgium was won by Mme. Debauche. The third Brazilian national gliding championship was held from Feb. 12 to 20. The winner in category A was A. Oliveira flying a BN-1, and the winner in category B was P. Santos, flying a Grunau.

Forty-four pilots competed in the 23rd national soaring contest which was held at Grand Prairie, Tex., July 31 to Aug. 9, 1956. A total of 42,200 mi. was flown; 15 flights were longer than 100 mi., and 45 flights were more than 200 mi. long. Lyle Maxey earned the title of national champion, flying a sailplane of his own design. (B. SK.)

Gold. World gold monetary reserves continued to grow throughout 1956 (Chart I). In Sept. 1956, they stood at about \$38,500,000,000 as against \$37,870,000,000 a year earlier (excluding the U.S.S.R.). Of the 1956 total, the United States held \$22,032,000,000 (\$287,000,000 above Sept. 1955); other countries, together with the Bank for International Settlements and the European Payments union, held about \$14,750,000,000 (\$375,000,000 above Sept. 1955), and the International Monetary fund \$1,711,000,000 (\$40,000,000 below Sept. 1955). In Sept. 1956, the United States thus held 57% of the world monetary gold stock, as against 70% in Sept. 1949.

Of the increase in the United States stock, \$82,000,000 was purchased from other countries (the first net purchases since 1952) and \$175,000,000 from the International Monetary Fund. The countries outside the United States added to their monetary stocks chiefly by purchases from new production. New gold output (excluding the U.S.S.R.) was about \$1,000,000,000; the portion of it not absorbed into official reserves—about one-third, as a year previous—went to meet the needs of the arts and industry and private hoarding demand.

The bulk of the newly mined gold was disposed of through the London gold market. The dollar equivalent of the London price remained within the United States buying and selling prices of \$34.9125 and \$35.0875 (\$35 plus or minus 1%), at which the Federal Reserve Bank of New York, acting on behalf of the United States treasury, deals with foreign monetary authorities. Sellers thus received a higher price in London, and foreign monetary authorities found it cheaper to acquire gold in London than from the United States treasury.

Besides gold, countries outside the United States in Sept. 1956 held about \$14,400,000,000 in the form of dollars, on both official and private account (including primarily deposits in United States banks and short-term and certain longer-term United States government securities) or about \$1,600,000,000 more than a year previous (Chart I). This rise was due to the excess of payments made by the United States for imported goods and services, and on account of government grants, military expenditures, and government and private capital outflows, over current and capital payments made by other countries to the United States.

Total gold and dollar holdings of countries other than the United States in Sept. 1956 amounted to \$29,100,000,000. They were \$14,000,000,000, or nearly twice as high as in Sept. 1949,

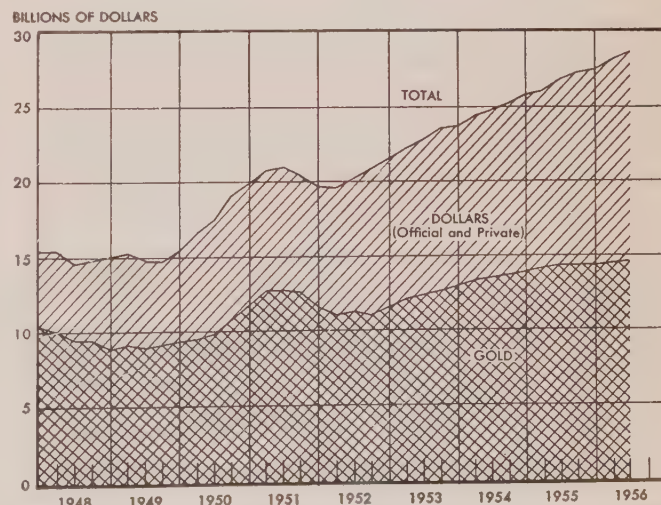


CHART I.—GOLD AND DOLLAR HOLDINGS OF COUNTRIES OTHER THAN THE U.S., including the Bank for International Settlements and the European Payments union; excluding other international institutions and, as regards gold, the U.S.S.R. Holdings include official gold reserves (reported or estimated), official and private short-term dollar holdings as reported by banks in the U.S., and estimated holdings of U.S. government securities having an original maturity of more than one year

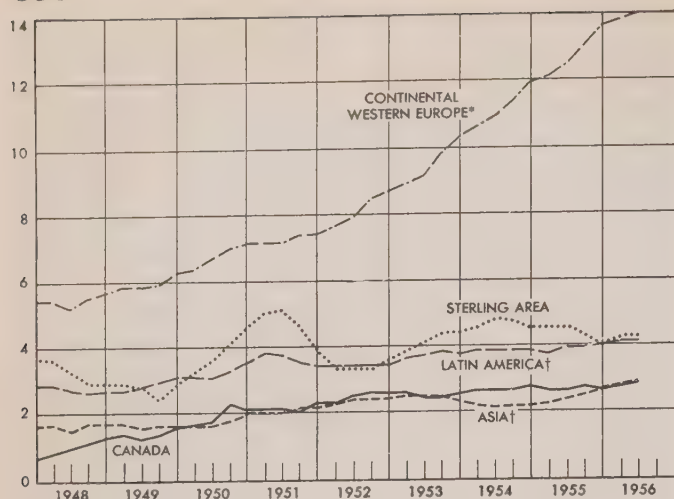


CHART II.—GOLD AND DOLLAR HOLDINGS OF SELECTED AREAS, in billions of U.S. dollars. Holdings include official gold reserves (reported or estimated), official and private short-term dollar holdings as reported by banks in the U.S., and estimated holdings of U.S. government bonds and notes having an original maturity of more than one year. *Includes holdings of Turkey and those of the Bank for International Settlements for the European Payments union as well as for its own account; gold to be distributed by the Tripartite Commission for the Restitution of Monetary Gold is also included. †Excluding sterling, French-franc and Dutch-guilder areas

the date of the general currency devaluations, and \$9,500,000,000, or about 50%, higher than in March 1952, before the current build-up of gold and dollar holdings had begun. These aggregates conceal, of course, important changes in gold and dollar holdings of particular countries and areas (Chart II). During the twelve months ended Sept. 1956, the holdings of continental western Europe increased by \$1,300,000,000 (West Germany and Switzerland were the principal gainers, and France the main loser); those of Latin American and Asian countries, as well as of Canada, showed moderate increases. The aggregate gold and official and private dollar holdings of sterling-area countries showed a small increase, but central gold and official dollar holdings held by the United Kingdom as the area's banker fell by \$17,000,000; they fell further by \$363,000,000 in October and November.

Not only was the rise in gold and dollar holdings unevenly distributed, but in some countries it reflected merely receipts of dollars under defense support and other aid programs of the United States. Another weakness in international payments was the renewed payments difficulties in many countries, due to an inflationary rise in demand (which led to larger imports and smaller exports), price and cost disparities, and other factors, some of a speculative character.

(M. A. K.)

World Production.—The gold output of the world by the principal countries producing it are shown in the table, based on data of the U.S. bureau of mines. Because estimates only were available for the U.S.S.R., the grand total is provisional.

United States.—Domestic output of gold in 1955 was 1,876,800 oz. or 3% greater than in 1954. In 1955 South Dakota, Utah, and California produced 65% of the total. In the first half of 1956, domestic output was about 685,500 oz. The leading gold-producing state was South Dakota, with nearly 40% of the six-month total; together with Utah and California, the three states produced 88%. Some is by-product gold from base metal ores, chiefly copper, but most of it is from straight gold mining—both lode and placer.

Canada.—The second largest world producer of gold increased its output of gold to 2,911,947 oz. in the first eight months of 1956.

Mexico.—Effective Jan. 1, 1956, a decree of the Mexican congress raised the production tax on gold.

Union of South Africa.—The world's largest known producer

World Production of Gold (Refinery Production)

	1949	1950	1951	1952	1953	1954	1955
United States . . .	1,922	2,289	1,895	1,927	1,970	1,859	1,877
Canada	4,124	4,441	4,393	4,472	4,056	4,366	4,556
Mexico	406	408	394	459	483	387	385
Central America . .	289	304	314	316	334	259	244
South America . . .	1,075	1,071	1,009	995	1,004	976	1,018
India	164	197	226	253	223	241	215
Belgian Congo . . .	334	339	352	369	371	365	365
Gold Coast	677	689	699	691	731	787	686
Southern Rhodesia .	528	511	487	497	501	536	525
South Africa	11,705	11,664	11,516	11,819	11,941	12,237	14,602
Australia	890	868	896	980	1,075	1,117	1,045
Total (est.)	31,000	32,700	33,500	34,300	33,700	35,100	36,400

of gold had an output of 11,863,812 oz. in the first nine months of 1956.

(See also EXCHANGE CONTROL AND EXCHANGE RATES; MINERAL AND METAL PRODUCTION AND PRICES.)

(F. E. H.; B. B. M.)

Gold Coast. Comprising British colonies (Gold Coast colony and Ashanti), protectorate (Northern Territories) and Togoland (under U.K. trusteeship; western part of former German colony), the Gold Coast is located on the west coast of Africa, bounded west, north and east by French territories (Ivory Coast, Upper Volta, Togo). The territories are administered together. Total area: 91,843 sq.mi. Total pop. (1948 census) 4,118,450; (1955 est.) 4,620,000. Capital, Accra. Areas and populations are as shown in the table.

Territory	Area (sq.mi.)	Population (1948 census)	Capital or chief town (1948 census)
Gold Coast colony	23,937	2,050,235	Accra (135,926)
Ashanti	24,379	818,944	Kumasi (59,420)
Northern Territories	30,486	866,503	Tamale (16,164)
Togoland	13,041	382,768*	Ho (5,840)

*This figure is included in the figures for Gold Coast colony and the Northern Territories with which Togoland is administered.

Languages: tribal tongues; Hausa. Religions: pagan; Moslem and Christian minorities. Other chief towns (pop. 1948 census): Sekondi-Takoradi 44,557; Cape Coast 23,346; Koforidua 17,806. Governor in 1956, Sir Charles Arden-Clarke; prime minister Kwame Nkrumah.

History.—On Jan. 1, 1956, the prime minister, K. Nkrumah, leader of the Convention People's party (C.P.P.), invited all parties to a conference to study the Bourne report recommending a major transfer of power from central to regional authorities. In May the *asanteman* council, which had previously boycotted discussion on the constitution, stated that independence was no longer an issue in dispute but that the constitution must be agreed upon and followed by general elections before and not after, the achievement of independence. The National Liberation movement rejected the government proposals on the constitution but reaffirmed its desire for independence and commonwealth membership.

On May 11 the secretary of state for the colonies, A. Lennox-Boyd, announced that because of the dispute about the constitution elections should be held and the U.K. government would then accept a resolution by the house of assembly calling for independence, if passed by a reasonable majority, and declare a firm date for the granting of independence. In July control of the Gold Coast forces was transferred from the war office to the governor. General elections were held on July 12 and 17. The C.P.P. won all seats in the colony and 8 out of 21 in Ashanti. In the Northern Territories the Northern People's party won 15 out of 26 seats.

Meanwhile, on May 9, the Togoland trust territory had voted by plebiscite in favour of integration with the Gold Coast, after the grant of independence, and the UN Trusteeship council advised the general assembly that the result of the plebiscite be accepted.

On Aug. 3 the house of assembly passed a resolution requesting



TOGOLAND RESIDENT amusing fellow tribesmen and officials during registration for plebiscite held May 9, 1956, to determine the political future of the territory presently administered by Great Britain as part of the Gold Coast colony.

The U.K. government for independence (the opposition boycotted the debate, objecting to the request for independence before a constitution had been agreed upon), and on Sept. 18 the secretary of state for the colonies announced that, subject to parliamentary approval, the Gold Coast on March 6, 1957, would become an independent state within the commonwealth under the name of Ghana. If the UN general assembly agreed, the trust territory of Togoland would be included. On Oct. 8 government and opposition agreed to discuss all aspects of the constitution.

(See also TRUST TERRITORIES.)

(W. H. Is.)

Education.—Schools (1955): primary 3,271, pupils 403,201; middle 864, pupils 104,585; secondary 64, pupils 8,602; teacher training colleges 28, students 3,182. Higher education: University college of the Gold Coast, students 471; Kumasi college of technology, students 676.

Finance and Trade.—Monetary unit: West African pound (£W.A.I.=£1 sterling=U.S. \$2.80). Budget (1954-55): revenue £80,567,534, expenditure £79,860,268. Foreign trade (1954): imports £71,154,510, exports £14,673,025. Main exports: cocoa, gold, diamonds, manganese, bauxite.

Golf. There were several thrilling triumphs recorded in United States major golf championships of 1956. One of these saw Cary Middlecoff of Memphis, Tenn., a former dentist, win the U.S. open title at Rochester, N.Y., in a close finish. Middlecoff, who also won this event in 1949, posted 281 for 72 holes. Ben Hogan, trying for an unprecedented fifth U.S. open crown and the only current competitor who had ever won the championship four times, finished in a tie with Julius Boros for second at 282. Hogan seemed about to close in on Middlecoff but at the first hole failed to sink a two-foot putt. Peter Thomson, the Australian, who led at the conclusion of the first 36 holes, finished in a tie at 285 with Ed Furgol and Ted Kroll.

Thomson left for England shortly after this tourney and proceeded to win the British open for the third straight year. At Hoylake, Thomson's golf brought him a winning aggregate of 286. Flory Van Donck of Belgium finished second at 289.

Despite the fact that Kroll had tossed away a golden opportunity in the U.S. open, he later emerged as the leading money player of the year. He met a setback in the Professional Golfers Association (P.G.A.) championship at Canton, Mass., where he bowed in the final to Jack Burke, Jr., of Houston, Tex., by 1 and 2. But Kroll, registered from St. Petersburg, Fla., went on to win the "world's championship," annually sponsored by George S. May at Chicago's Tam O'Shanter course. The first

prize that Kroll won as a result of his score of 273 was \$50,000. This rich plum helped him boost his winnings for the year to more than \$70,000.

Burke, besides winning the P.G.A. title for the first time, enjoyed a noteworthy season by crashing through to bag the Masters tournament at Augusta, Ga., in the spring. Ken Venturi, a 22-year-old amateur from San Francisco, Calif., had set a whirling pace to lead the brilliant field chiefly composed of the nation's top professional players. However, in the fourth and final round, Venturi closed with an 80 while Burke finished with a 71 which brought him the victory at 289. Venturi was next with 290 while Middlecoff trailed by a stroke at 291.

The national amateur championship went to Harvie Ward, Jr., of San Francisco. Ward, who was born in Tarboro, N.C., repeated his 1955 triumph. In the 36-hole final at the Knollwood club, Lake Forest, Ill., he turned back Charles Kocsis of Royal Oak, Mich., by 5 and 4. Thus Ward became the first golfer to win this championship twice in succession since Lawson Little (also of San Francisco) accomplished this feat in 1935, prior to entering the professional ranks.

Ben Hogan appeared on the international scene by competing in the Canada cup matches at Wentworth, Eng., with Sam Snead as his partner. This United States pair won the cup and Hogan scored as the individual star.

The United States, whose amateurs won the Americas cup against Canadian and Mexican men's teams, was not as successful in the biennial Curtis cup matches. The women's amateur team bowed to the British women at Sandwich, Eng., by 5 to 4.

An American girl, 19-year-old Margaret (Wiffi) Smith of St. Clair, Mich., succeeded in capturing the British women's championship in an all-American final. Miss Smith vanquished Mary Patton Janssen of Charlottesville, Va., by 8 and 7 and later added the women's French amateur title as well. In the U.S. women's amateur, Miss Smith lost to Ann Carey Johnstone of Mason City, Ia., in a 19-hole third-round encounter. The tournament was staged at the Meridian Hills Country club, Indianapolis, Ind. The eventual winner was Marlene Stewart of Fonthill, Ont., who became the first Canadian-born golfer to carry off this honour. Miss Stewart defeated 17-year-old JoAnne Gunderson of Kirkland, Wash., 2 and 1, in the final. The U.S. women's open went to Katharine Cornelius after a play-off with amateur Barbara McIntire, 75 to 82, at the Northland Country club, Duluth, Minn.



SWINGING FROM THE CLUBHOUSE ROOF after his tee shot on the 9th hole landed there, Tom Davies of the University of Iowa fired his second shot just short of the green during the Iowa Open golf tournament at Okoboji, Ia., in Sept. 1956

An outstanding achievement was the winning of the British amateur by an unheralded 18-year-old, John C. Beharrell, who defeated Leslie Taylor 5 and 4. (L. A. WN.)

Government Departments and Bureaus, U. S.

The principal departments and bureaus of the U.S. government, and their chief executive officers as of Oct. 1, 1956, were:

Department or bureau	Name	Post
Department of state	*Dulles, John Foster	Secretary
U.S. mission to the UN	Hoover, Herbert, Jr.	Undersec'y.
International Cooperation administration	*Lodge, Henry Cabot, Jr.	U.S. Representative
	Hollister, John B.	Director
Department of the treasury	*Humphrey, George M.	Secretary
	Burgess, W. Randolph	Undersec'y.
Office of the comptroller of the currency	Gidney, Ray M.	Comptroller
Office of the treasurer of the U.S.	Priest, Ivy Baker	Treasurer
Bureau of customs	Kelly, Ralph	Commissioner
Internal revenue service	Harrington, Russell C.	Commissioner
Bureau of narcotics	Anslinger, Harry J.	Commissioner
Bureau of the mint	Brett, William H.	Director
U.S. savings bonds division	Buckley, John R.	Natl. Director
*U.S. coast guard	Richmond, Alfred C.,	
	Vice-Adm.	Commandant
*U.S. secret service	Baughman, U. E.	Chief
Department of defense	*Wilson, Charles E.	Secretary
Joint chiefs of staff	*Radford, Arthur W., Adm.	Chairman
	*Taylor, Maxwell D., Gen.	
	*Burke, Arleigh A., Adm.	
	*Twining, Nathan F., Gen.	
	Pate, Randolph McC.,	
	Gen.1	
Armed Forces Policy council	*Wilson, Charles E.	Chairman
Department of the army	*Brucker, Wilber M.	Secretary
	Finucane, Charles C.	Undersec'y.
Chief of staff	*Taylor, Maxwell D., Gen.	Chief
Women's army corps	Galloway, Irene O., Col.	Director
Department of the navy	*Thomas, Charles S.	Secretary
	Gates, Thomas S., Jr.	Undersec'y.
Chief of naval operations	*Burke, Arleigh A., Adm.	Chief
Asst. chief for women, bureau of naval personnel	Wilde, Louise Kathleen,	
	Capt.	Ass't. Chief for Women
*U.S. marine corps	Pate, Randolph McC., Gen.	Commandant
Women marines	Hamblet, Julia E., Col.	Director
Department of the air force	*Quarles, Donald A.	Secretary
	Douglas, James H.	Undersec'y.
Chief of staff	*Twining, Nathan F., Gen.	Chief
Women in the air force	Gray, Phyllis D. S., Col.	Director
Department of justice	*Brownell, Herbert, Jr.	Att'y. Gen.
Deputy attorney general	Rogers, William P.	Deputy Att'y. Gen.
*Federal Bureau of Investigation	Hoover, J. Edgar	Director
Bureau of prisons	Bennett, James V.	Director

Department or bureau	Name	Post
*Immigration and naturalization service	Swing, Joseph M.	Commissioner
*Post office department	*Summerfield, Arthur E.	Postmaster Gen.
Department of the interior	*Seaton, Fred A.	Secretary
Bureau of land management	Woolley, Edward	Director
Bureau of Indian affairs	Emmons, Glenn L.	Commissioner
*Geological survey	Nolan, Thomas B.	Director
Fish and wildlife service	Farley, John L.	Director
Bureau of reclamation	Dexheimer, Wilbur A.	Commissioner
*National park service	Wirth, Conrad L.	Director
Bureau of mines	Ankeny, Marling J.	Director
Office of territories	Lausi, Anthony T.	Director
Defense Minerals Exploration administration	Mittendorf, C. O.	Administrator
Bonneville Power administration	Pearl, William A.	Administrator
Southwestern Power administration	Wright, Douglas G.	Administrator
Southeastern Power administration	Leavy, Charles W.	Administrator
Department of agriculture	*Benson, Ezra Taft	Secretary
Federal-States relations	Peterson, Ervin L.	Ass't. Secretary
Agricultural conservation program service	Koger, Paul M.	Administrator
*Agricultural Research service	Shaw, B. T.	Administrator
Farmer cooperative service	Knapp, Joseph G.	Administrator
Federal extension service	Ferguson, Clarence M.	Administrator
Forest service	McArdle, Richard E.	Chief
*Soil conservation service	Williams, Donald A.	Administrator
Agricultural Stabilization	McLain, Marvin L.	Ass't. Secretary
Commodity Credit corporation	Morse, True D.	President
Commodity Stabilization service	Berger, Walter C.	Acting Administrator
Federal Crop Insurance corporation	McCartney, Frank N.	Manager
Agricultural Credit services	Scott, K. L.	Director
*Farmers Home administration	Hansen, Kermit H.	Administrator
*Rural Electrification administration	Hamil, David A.	Administrator
Marketing and Foreign Agriculture	Butz, Earl L.	Ass't. Secretary
Agricultural Marketing service	Wells, O. V.	Administrator
Commodity Exchange authority	Kauffman, Rodger R.	Administrator
Foreign agricultural service	Garnett, Gwynn	Administrator
Department of commerce	*Weeks, Sinclair	Secretary
	Williams, Walter	Undersec'y.
	Rohschild, Louis S.	Undersec'y.
		(transportation)
	Mueller, Frederick H.	Ass't. Sec'y.
		(domestic affairs)
	McClellan, Harold C.	Ass't. Sec'y.
		(international affairs)
	Moore, George T.	Ass't. Sec'y.
		(administration)
*Bureau of the census	Burgess, Robert W.	Director
National bureau of standards	Astin, A. V.	Director
*Coast and geodetic survey	Karo, H. Arnold	Director
*Civil Aeronautics administration	Pyle, James T.	Acting Administrator
*Patent office	Watson, Robert C.	Commissioner
Weather bureau	Reichelderfer, Francis W.	Chief
Bureau of public roads	Curtiss, C. D.	Commissioner
Maritime administration	Morse, Clarence G.	Administrator
Business and Defense Services administration	McCoy, Horace B.	Administrator
Department of labour	*Mitchell, James P.	Secretary
	Larson, Arthur	Undersec'y.
Bureau of labour statistics	Clague, Ewan	Commissioner
Bureau of apprenticeship	Patterson, William F.	Director
Women's bureau	Leopold, Alice K.	Director
Bureau of labour standards	Gurske, Paul E.	Director
Wage and hour and public contracts divisions	Brown, Newell	Administrator
Bureau of employment security	Goodwin, Robert C.	Director
Bureau of employees' compensation	McCauley, William	Director
Department of health, education and welfare	*Folsom, Marion B.	Secretary
	Hunt, Herold C.	Undersec'y.
*Public health service	Burney, Leroy E.	Surgeon Gen.
Office of education	Rackley, John R.	Acting Commissioner
*Social Security administration	Schotland, Charles I.	Commissioner
*Food and Drug administration	Larrick, George P.	Commissioner
Office of vocational rehabilitation	Switzer, Mary E.	Director
Independent offices and establishments		
*Atomic Energy commission	Strauss, Lewis L.	Chairman
Civil Aeronautics board	Durfee, James R.	Chairman
*District of Columbia	McLaughlin, Robert E.	President of the Board
*Export-Import Bank of Washington	Waugh, Samuel C.	President and Chairman
*Farm Credit administration	Tootell, Robert B.	Governor
*Federal Civil Defense administration	Peterson, Val	Administrator
*Federal Communications commission	McConaughy, George C.	Chairman
*Federal Deposit Insurance corporation	Cook, H. Earl	Chairman
Federal Home Loan Bank board	Robertson, Albert J.	Chairman
Federal Mediation and Conciliation service	Finnegan, Joseph F.	Director
*Federal Power commission	Kuykendall, Jerome K.	Chairman
*Federal reserve system, board of governors of the	Martin, William McC., Jr.	Chairman
*Federal Trade commission	Gwynne, John W.	Chairman
Foreign Claims Settlement Commission of the United States	Gilliland, Whitney	Chairman
General accounting office	Campbell, Joseph	Comptroller Gen. of the U.S.
General Services administration	Floete, Franklin G.	Administrator
Public buildings service	McConihe, F. Moran	Commissioner
National archives and records service	Grover, Wayne C.	Archivist of the U.S.
Federal supply service	Mack, Clifton E.	Commissioner
Defense Materials Service	Weaver, Elmer H.	Commissioner
Transportation and public utilities service	Goodyear, Clarence J.	Commissioner

Department or bureau	Name	Post
Government printing office . . .	Blattenberger, Raymond	Public Printer
Housing and Home Finance agency	Cole, Albert M.	Administrator
Federal National Mortgage association	Baughman, J. Stanley	President
Federal Housing administration.	Mason, Norman P.	Commissioner
Public Housing administration .	Slusser, Charles E.	Commissioner
Community facilities administration	Hazeltine, John C.	Commissioner
Urban Renewal administration	Steiner, Richard L.	Acting Commissioner
Indian claims commission	Witt, Edgar E.	Chief Commissioner
Interstate Commerce commission .	Arpaio, Anthony F.	Chairman
Library of Congress	Mumford, L. Quincy	Librarian
National Advisory Committee for Aeronautics	Hunsaker, Jerome C.	Chairman
National capital planning commission	Bartholomew, Harland	Chairman
*National Labor Relations board .	Leedom, Boyd	Chairman
National Mediation board	Edwards, Leverett	Chairman
†National Science foundation . . .	Waterman, Alan T.	Director
Railroad Retirement board	Kelly, Raymond J.	Chairman
St. Lawrence Seaway corporation .	Castle, Lewis G.	Administrator
*Securities and Exchange commission	Armstrong, J. Sinclair	Chairman
*Selective Service system	Hershey, Lewis B.	Director
Small Business administration . . .	Maj. Gen. Barnes, Wendell B.	Administrator
*Smithsonian institution	Carmichael, Leonard	Secretary
Tax court of the United States . . .	Murdock, J. Edgar	Chief Judge
*Tennessee Valley authority	Vogel, Herbert D.	Chairman
*U.S. civil service commission . . .	Young, Philip	Chairman
U.S. Information agency	Streibert, Theodore C.	Director
U.S. tariff commission	Brossard, Edgar B.	Chairman
*Veterans administration	Higley, Harvey V.	Administrator of Veterans Affairs
Executive office of the president		
Bureau of the budget	Brundage, Percival F.	Director
Council of economic advisers	Burns, Arthur F.	Chairman
National Security council	Lay, James S., Jr.	Executive Sec'y.
Central intelligence agency	Dulles, Allen W.	Director
Operations Coordinating board	Staats, Elmer B.	Executive Officer
Office of Defense Mobilization . . .	Flemming, Arthur S.	Director
Quasi-official agencies		
*American National Red Cross . . .	Harriman, E. Roland	Chairman
†National Academy of Sciences — National Research council	Bronk, Detlev W.	President

*See separate article.
†See Societies and Associations, U.S.

†Sits as co-equal when marine corps matters are being considered.

Grain: see BARLEY; CORN; OATS; RICE; RYE; WHEAT.

Grange, National: see SOCIETIES AND ASSOCIATIONS, U.S.

Grapefruit: see FRUIT.

Grapes: see FRUIT.

Graphic Arts: see PRINTING.

Great Britain & Northern Ireland,

United Kingdom of. The United Kingdom, in northwest-ern Europe, comprises the main island of Great Britain (kingdom of England, principality of Wales and kingdom of Scotland) and the six northeastern counties of Ireland, together with many small islands. It is a constitutional monarchy, with a sovereign and a parliament of two houses: the house of lords, which on Sept. 5, 1956, consisted of 4 peers of the blood royal, 826 hereditary peers (21 dukes, 27 marquesses, 35 earls, 106 viscounts and 537 barons; 19 peers, including 2 royal peers, were minors, not sitting), 26 spiritual peers (2 archbishops and 24 bishops [1 seat vacant]), 16 Scottish representative peers, a number of Irish representative peers (5 in 1956; vacancies no longer filled) and 8 life peers (high judicial officers; was also an hereditary peer); and the house of commons, 630 members (including the speaker) elected by universal suffrage. Table I shows areas and populations of the component parts and home dependencies of the United Kingdom of Great Britain and Northern Ireland.

Table I.—The United Kingdom

Division	Area (sq. mi.)	Population (1951 census)	(1955 est.)
England	50,871	41,584,328	44,441,000
Wales	7,474	2,173,560	5,140,000
Scotland	29,795	5,096,415	56,000
Isle of Man*	221	55,253	100,000
Channel Islands*	75	102,776	
Great Britain	88,436	49,012,332	49,737,000
Northern Ireland	5,459	1,370,921	1,399,000
United Kingdom	93,895	50,383,253	51,136,000

*Not part of legislative territory of U.K., but included in it for census purposes.

Table II.—Principal Cities of the United Kingdom
(With population over 200,000)

	1951 census	1953 est.	1951 census	1953 est.
London (greater), Eng.	8,347,923	8,334,000	Nottingham, Eng. . .	306,055
London (county and city), Eng. .	3,347,982	3,343,000	Hull (Kingston-upon-Hull), Eng.	299,105
Birmingham, Eng. .	1,112,685	1,118,500	Bradford, Eng. . . .	292,403
Glasgow, Scot. . . .	1,089,767	1,085,000	Newcastle upon Tyne, Eng.	291,724
Liverpool, Eng. . . .	788,659	789,700	Leicester, Eng. . . .	285,181
Manchester, Eng. . .	703,082	701,800	Stoke-on-Trent, Eng.	275,115
Sheffield, Eng. . . .	512,850	507,600	Coventry, Eng. . . .	258,245
Leeds, Eng.	505,219	505,500	Cardiff, Wales	243,632
Edinburgh, Scot. . .	466,761	470,500	Portsmouth, Eng. . .	233,545
Belfast, N. Ire. . . .	443,671	444,200	Plymouth, Eng. . . .	208,012
Bristol, Eng.	442,994	444,200		

Table III.—United Kingdom, Membership of Main Religious Groups,

1955 Estimates

(In thousands)

	England	Wales	Scotland	Northern Ireland*	Total
Anglican†	5,470	250	108	353*	6,181
Roman Catholic . . .	2,897	114	774	475*	4,260
Presbyterian‡	69	207§	1,292||	410*	1,978
Methodist¶	689	41	14	67*	811
Congregational** . .	220	121††	35	2	378
Baptist**	202	100	19	5	326
Jewish	429	4	15	2	450

*Figure for four largest denominations in Northern Ireland represent "professions" (1951 census) rather than full membership or communicant status; they are therefore probably too high in comparison with those for corresponding denominations in the other three countries. †Established Church of England; disestablished Church in Wales, Episcopal Church in Scotland, Church of Ireland; figures are for "persons definitely attached," according to parish records, in 1953. ‡Figures are for full membership. §Calvinistic Methodist Church. ||Communicants, established Church of Scotland; other small Scottish Presbyterian bodies are excluded. ¶Figures are for full membership in 1953, Methodist conference churches only; Independent Methodists (U.K., 1953) 9,000, Wesleyan Reform union (G.B., 1952) 6,000. **Figures are for full membership, 1955 est. ††Mainly Welsh Independents (latest est.). Note: In England, Presbyterians, Methodists (including Independent Methodists and Reform union), Baptists, Congregationalists (including Countess of Huntingdon's Connexion chapels) and Moravians (1955: 3,000 communicants) are linked by the Free Church Federal council. Other important Christian bodies were (1954 U.K. figures): the Brethren (Plymouth Brethren) 80,000; Churches of Christ (164 churches); Salvation Army (132,000); Friends (Quakers) 21,000.

Language: English is almost universally spoken, but in Wales (1951 census) 1.7% of the population spoke Welsh only and 28.9% spoke both languages; in Scotland (1951 census), 2,652 spoke Gaelic only and 91,630 spoke both languages; in the Isle of Man 528 spoke English and Manx. Queen, Elizabeth II (q.v.). Prime minister in 1956: Sir Anthony Eden (q.v.).

The following is a list of cabinet members of Great Britain on Dec. 1, 1956:

Post	Name
Prime minister and first lord of the treasury . .	Sir Anthony Eden
Lord president of the council	Marquess of Salisbury
Lord privy seal and leader of the house of commons	R. A. Butler
Chancellor of the exchequer	Harold Macmillan
Lord Chancellor	Viscount Kilmuir
Secretary of state for foreign affairs	Selwyn Lloyd
Secretary of state for the home department and minister for Welsh affairs	Gwilym Lloyd-George
Secretary of state for Scotland	James Stuart
Secretary of state for commonwealth relations .	Earl of Home
Secretary of state for the colonies	A. T. Lennox-Boyd
Paymaster-general	Sir Walter Monckton
Minister of defense	Antony Head
Minister of housing and local government . . .	Duncan Sandys
President of the board of trade	Peter Thorneycroft
Minister of agriculture, fisheries and food . .	D. Heathcoat Amory
Minister of education	Sir David Eccles
Minister of labour and national service . . .	Iain Macleod
Chancellor of the duchy of Lancaster	Lord Selkirk
Minister of works	Patrick Buchan-Hepburn

History.—The year 1955 ended with a renewal of unfriendly exchanges between Great Britain and the U.S.S.R. The Soviet government leaders, N. S. Khrushchev and N. A. Bulganin, touring India and Burma, angered the British people by many provocative statements, in particular when they blamed the western powers for World War II.

Consideration by parliament of the major problem of inflation began early in 1956 with a declaration (Jan. 18) by the prime minister, Sir Anthony Eden, that price stabilization would be encouraged by all possible means. He also promised a drive against monopolistic practices in industry.

There was at this time much top-level diplomatic activity and discussion on the international situation, with Eden and Selwyn



DUKE OF EDINBURGH (right) talking to his children, Prince Charles and Princess Anne, before taking part in a polo match at Windsor Great Park, Eng., in June 1956

Lloyd, secretary of state for foreign affairs, arriving in Washington, D. C., on Jan. 30 for informal talks with Pres. Dwight D. Eisenhower and the U.S. secretary of state, John Foster Dulles. At home, television gained new devotees; considerably more than 5,000,000 licences were in circulation, and commercial television, which had been inaugurated in Sept. 1955, announced plans for expansion to the midlands, which were put into effect later in the year.

February began with the planned revelation that the former British diplomats D. Maclean and G. Burgess were in Moscow, and continued with further credit restrictions and another increase in the bank rate. The house of commons decided in favour of the abolition of hanging, but a measure to this effect was subsequently rejected by the house of lords, and the year ended with the publication of a government bill proposing to retain the death penalty only in certain exceptional cases.

After the tour of Nigeria by Queen Elizabeth II and the duke of Edinburgh in January and February, March began with sensational and ominous international news which was to continue, with increasing emphasis, throughout the year. The dismissal of Lieut. Gen. J. B. Glubb as commander of the Arab legion on March 2 was followed on March 9 by the deportation of Archbishop Makarios III from Cyprus on the charge that he had actively encouraged terrorists.

The evacuation by British troops of the Suez Canal Zone coincided with visits of Soviet leaders to Britain. First G. M. Malenkov, the former chairman of the council of ministers, made a three-weeks' tour, and then N. S. Khrushchev and N. A. Bulganin paid a visit (April 18-28). The latter was marked by a series of talks with British ministers and by a quarrel with the Labour party following incidents at a dinner given by the Labour party executive at the house of commons.

On this occasion H. T. N. Gaitskell, leader of the Labour party,

had asked the Soviet leaders to use their influence to obtain the release of Social Democrats imprisoned in the U.S.S.R. and east European countries. Khrushchev retorted angrily to this request and attacked the Labour party after his return to Moscow.

On May 15 talks in London on the future of the constitution of Singapore broke down, mainly over the question of internal security, and June saw a worsening of the situation in Cyprus with a great increase in terrorist activity.

On July 26 there occurred the event which was to have the gravest repercussions throughout the rest of the year. Egypt proclaimed its nationalization of the Suez Canal company, a decision which, it was alleged, had been provoked by the U.S. and British announcements that they would not finance the Aswan dam scheme which was to irrigate much of Egypt's parched land.

The British and the French denounced the decision as an act of plunder and took precautionary military measures. British families were evacuated from the Canal Zone and an international conference was convened in London at which only 2 of the 24 invited countries—Egypt and Greece—were not present.

Egypt proposed further discussions through the United Nations aimed primarily at a revision of the 1888 convention and, on Aug. 27, announced the arrest of two Britons and four Egyptians, and then two more Britons in connection with an alleged spying ring. So tension mounted while embassy and oil officials and newspaper correspondents were expelled from Egypt.

On the farms heavy rains in July, August and much of September were responsible for a particularly difficult harvest. The increased number of combine harvesters and drying plants made it possible eventually to rescue almost all the corn crops but drying costs were exceptionally high. Harvesting of potatoes and sugar beets later in the year was also difficult and expensive, but milk production was increased by the excellent growth of grass.

In the late summer and autumn there was no cessation of the cataract of events surrounding the Suez canal dispute. Parliament had been recalled from its summer recess. A second and then a third London conference were held and the decision taken to set up a Suez Canal Users' association, and as the Security council was called upon to consider Anglo-French and Egyptian points of view, the gravity of the situation was increased by news of border friction between Israel and Egypt.

Drama became nearly continuous. Army reservists who had been called up for the emergency held protest meetings in both Cyprus and Malta, and the Labour party conference—at which Aneurin Bevan was elected party treasurer—and the Conservative party conference were inevitably much concerned with international affairs. The U.S.S.R. took the stage with a threat to veto the Anglo-French Suez plan.

On Oct. 17 Queen Elizabeth II opened Britain's first nuclear power station at Calder Hall. This was the first such station to be completed in the world, and aroused widespread interest. On Oct. 15 the duke of Edinburgh started on a world tour, visiting Kenya, the Seychelles Islands, Ceylon, Malaya and New Guinea on his way to open the Olympic games at Melbourne, Austr., on Nov. 22. Thereafter he visited New Zealand and was to return through the south Pacific and the south Atlantic, visiting Gambia in January.

During October great enthusiasm was aroused by the visit to London of the Bolshoi ballet company. Then, while world attention was focused on the first reports of the Hungarian rising, Israel invaded Egypt and Britain and France gave a 12-hr ultimatum to the protagonists to cease fire. This was rejected by Egypt and on Oct. 31 British and French bombers attacked military targets in Egypt.



GREAT BRITAIN, 1956

People made the news. Throughout the summer English cities experienced scenes like that at top, left, in connection with the showing of a U.S. motion picture featuring "rock and roll" music. In April Irish nationalists made a daylight theft of a painting from the Tate gallery, London, after first advising a photographer to be present. Former U.S. president Harry S. Truman was awarded an honorary degree at Oxford (top, right) during his visit to England in the spring. Shown with him in the photograph is Mrs. Truman. In August British paratroops were sent to the mideast (right) and later participated in the Anglo-French invasion of Egypt. Nina Ponomareva (bottom, left), Soviet athlete, was arrested in London on a charge of stealing five women's hats. The ensuing diplomatic difficulties caused a cancellation of the track meet in which she was to appear. The mysterious disappearance of frogman Lionel Crabb (bottom, centre) was the subject of considerable speculation in April. He was reported to have last been seen investigating the waters of Portsmouth harbour where two Soviet warships were anchored during the visit of Premier Nikolai Bulganin and Nikita Khrushchev to England. Bulganin is shown at bottom, right, leaving New college, Oxford, after an inspection of the university





REFINERY FIRE at Essex, Eng., Sept. 24, 1956. Four thousand tons of fuel oil were burned before London firemen checked the blaze

This precipitated an international storm. The Anglo-French action was widely condemned and the UN general assembly called for an immediate cease-fire. In a number of debates in the house of commons the opposition condemned the government's policy in the most vigorous terms; on Nov. 1 there was such uproar that the speaker had to suspend the session for half an hour. The vote of censure moved by the opposition on this date was defeated by a majority of 69. In neither party, however, was opinion unanimous. Two junior Conservative ministers, Anthony Nutting, minister of state for foreign affairs, and Sir Edward Boyle, financial secretary to the treasury, resigned their posts, while one Labour member resigned his seat. Other members on both sides of the house expressed disagreement with their party's policy. Opinion in the country was also sharply divided though Gallup polls showed that a majority supported the action taken by the government.

On Nov. 5-6 Anglo-French air-borne and sea-borne forces landed at and captured Port Said and Port Fuad and, after first attempts at a local cease-fire had proved abortive, Egypt, Israel, Britain and France agreed to a cessation of hostilities and the United Nations immediately planned the formation of an international police force.

As a result of the blocking of the Suez canal it was announced on Nov. 20 that motor fuel rationing would come into force on Dec. 17. Ration books would, in the first instance, be issued for a four-month period and the allowance for motorists would be for 200 mi. a month.

On Nov. 23 the prime minister, who was suffering from the effects of severe strain following months of anxiety and overwork, left upon medical advice for a three-weeks' rest in Jamaica. During his absence R. A. Butler, lord privy seal and leader of the house of commons, presided over cabinet meetings.

Sympathy for the Hungarians, whose revolt was ruthlessly suppressed by Soviet troops, was widely expressed throughout Britain. There were many resignations from the Communist party; dockers refused in some cases to load Soviet ships in British ports, and the National Union of Mineworkers condemned the

U.S.S.R. and wrote to the Soviet miners' union stating that British trade unionists could see little hope for successful co-operation in these "more than tragic circumstances." The lord mayor of London, Sir Cullum Welch, opened a Hungarian relief fund which in ten days received contributions of more than £400,000, and Hungarian refugees were welcomed and cared for.

(See also ATOMIC ENERGY; BUDGET, NATIONAL; COMMONWEALTH OF NATIONS; EGYPT; EMPLOYMENT; EUROPEAN UNION; FOREIGN INVESTMENTS; INTERNATIONAL TRADE; LABOUR UNIONS; NORTH ATLANTIC TREATY ORGANIZATION; STRIKES; UNITED NATIONS.) (Rt. Ch.)

Education.—*England and Wales* (1955): grant-aided, direct grant and recognized independent schools: nursery 495, pupils 24,272, teachers 1,052 primary (including 390 with secondary departments and 3,528 all-age schools) 24,763, pupils 4,796,763, teachers 160,909; secondary (including 307 technical and 55 with technical departments) 5,562, pupils 2,077,816 teachers 702,102; special (for physically or mentally handicapped children) 743, pupils 58,034, teachers 4,381. Further education (including art schools, 1955): full-time 504, students 63,149; part-time (day) 688 students 402,239; evening 9,796 (including 9,138 evening institutes), pupils 1,901,463; all teachers 11,555. *Scotland* (1955): public and grant-aided schools: nursery 75, pupils 4,540, teachers 150; primary 2,237 pupils 598,011, teachers 17,736; secondary (including 634 with primary departments) 809, pupils 227,077, teachers 11,203; special 88, pupils 10,117, teachers 632. Independent schools, pupils 21,069. Approved schools: pupils 1,330. Further education (1955): pupils 236,024 of which 27,471 in central institutions and 208,553 in further education centres. *Northern Ireland* (1954-55): grant-aided schools: primary 1,635, pupils 207,393, teachers 6,340; intermediate (including technical intermediate) 53 pupils 16,721, teachers (excluding technical intermediate, who are also employed in institutions of further education) 429; secondary (grammar 81, pupils 30,899, teachers 1,765; special 14, pupils 1,072, teachers 70 centres of further education 154 (of which 95 permanent), student 32,331, teachers 1,500. Universities (1955-56): *England* 15, full-time students 62,557; *Scotland* 4, full-time students 14,058; *Wales* 1, full-time students 4,714; *Northern Ireland* 1, full-time students 2,179. University colleges: *England* 2, full-time students 1,292; *Scotland* (technical) 1,315; *Wales* 1, full-time students 140; *Northern Ireland* 1, full-time students 83.

Finance and Banking.—Official exchange rate, £1 = U.S. \$2.80. Budget (1955-56 actual) revenue £4,893,100,000, expenditure £4,496,000,000 (1956-57 est.) revenue £5,197,500,000, expenditure £4,757,700,000. *Northern Ireland*: (1955-56 actual) revenue £67,023,027, expenditure £66,950,379; (1956-57 est.) revenue £74,262,000, expenditure £74,207,000. Total public debt: (March 1955) £26,933,000,000; (March 1956) £27,774,000,000. Currency circulation (April 1955): £1,640,000,000 (April 1956) £1,740,000,000. Deposit money: (April 1955) £5,440,000,000; (April 1956) £3,630,000,000. Gold, U.S. and Canadian dollar holdings: (April 1955) U.S. \$2,686,000,000; (April 1956) U.S. \$2,328,000,000.

Foreign Trade.—Imports (1955) £3,886,000,000; exports £3,024,000,000 re-exports £119,000,000. Main sources of imports (1955): sterling area 40%; continental E.F.U. (European Payments union countries) 22%; U.S. and Canada 20%; Latin America 6%. Main destinations of exports (1955): sterling area 48%; continental E.P.U. countries 25%; U.S. and Canada 11%; Latin America 4%.

Transport and Communications.—Railways (1955): *Great Britain*, route length 32,400 km.; *Northern Ireland* (1954) 749 km. Passenger journeys originating (British railways, 1955) 967,200,000. Freight traffic (excluding *Northern Ireland*, 1955) 34,932,000,000 ton-km. Roads (March 1954): *Great Britain* 187,040 mi. Motor vehicles licensed (Nov. 1955): passenger 3,472,000; commercial 1,045,100. Air transport (1955): passenger-km. 2,875,716,000; freight, ton-km. 100,656,000. Shipping: merchant vessels on British Commonwealth registers, 500 gross tons and over (Aug. 1956): nontankers 15,416,000 gross tons; tankers 5,518,000 gross tons. Shipping movements at U.K. ports (net tons registered, 1955): entered with cargo, mail only 648,000, others 78,576,000; entered in ballast with passengers only 5,892,000, calling for bunker only 324,000, other 11,316,000. Telephones (March 1955): 6,483,040 (76.3% with automatic dial). Radio licences (Sept. 1955): sound only 9,271,000, sound and television licences 4,884,000.

Agriculture and Fisheries.—Production (long tons, 1955): wheat 2,599,000; barley 2,936,000; oats 2,709,000; rye, threshed, 19,000; mixed corn 510,000; potatoes 6,278,000; sugar beets 4,556,000. Livestock (June 1956): cattle 10,915,000; sheep 23,607,000; pigs 5,522,000; poultry 92,731,000. Fisheries (total landings, 1954) 76,200 tons. Meat (metric tons, 1955): beef and veal 663,000; mutton and lamb 175,000; pork 693,000.

Industry.—Establishments employing 11 or more persons 58,921. Total working population: (April 1956) 23,975,000, of whom 16,128,000 were men; (Dec. 1955) 24,018,000, of whom 16,122,000 were men. Armed forces: (April 1956) 770,000, of whom 16,000 were women; (Dec. 1955) 773,000, of whom 17,000 were women. Registered unemployed (excluding temporarily stopped) 235,000 in Dec. 1955, 218,000 in April 1956. Index of production: total (1948 = 100) 130 in 1954, 137 in 1955; manufacturing (1954) 133, (1955) 142. Industrial production (1955): coal 211,000,000 long tons; gas (available at gas works) 600,600,000 cu.ft.; electricity generated 80,148,000,000 kw.hr.; iron ore (28% metal content) 16,172,000 long tons; pig iron 12,480,000 long tons; crude steel 19,812,000 long tons; phosphatic fertilizers (P₂O₅ content) 324,000 long tons; cement 12,516,000 long tons; motor cars 897,560; tractors (10-belt h.p. and over) 136,944; trucks 268,716; steam locomotives 469; diesel locomotives 760; railway coaches 2,211; freight cars 63,859; aircraft (excluding military types except those for export) 555, of which 527 for export; merchant

vessels completed, 100 gross tons and over, 1,282; permanent houses and flats completed 324,023; woven cotton cloth 1,783,600,000 yd.; woven woolen and worsted fabrics 410,040,000 sq.yd. (excluding 28,080,000 sq.yd. of blankets); rayon filament yarn 232,560,000 lb.; rayon staple fibre 239,280,000.

ENCYCLOPÆDIA BRITANNICA FILMS.—*British Isles* (1948); *Canals of England* (1952); *England* (1955); *Picture of Britain* (1955).

Great Lakes Traffic: see CANALS AND INLAND WATERWAYS.

Greece. The kingdom of Greece occupies the southern part of the Balkan peninsula. Area: 51,182 sq.mi.; the mainland accounts for 41,328 sq.mi.; the islands, of which the largest is Crete (3,235 sq.mi.), for 9,854 sq.mi. Pop.: (1951 census) 7,630,587; (1955 est.) 7,973,000. Language (1940): Greek 93%; Turkish 3%; Macedonian Slav 1.4%; Albanian 0.9%; Macedo-Rumanian 0.8%. Religion (1940): Greek Orthodox 96.5%; Roman Catholic 0.4%; Moslem 1.9%; Jewish 0.7%. Chief towns (1951 census, municipal area only): Athens (cap.) 65,084 (pop. of greater Athens 1,378,586, including Peiræeus and suburbs); Peiræeus 186,014; Salonika (Thessaloniki) 217,449; Patras 79,014. Ruler, King Paul I; prime minister in 1956, Konstantinos Karamanlis.

History.—Parliament was dissolved on Jan. 10, 1956, and general elections were held on Feb. 19 on the basis of a new and somewhat complex electoral system consisting of a combination of majority voting and proportional representation. The elections were contested by two main political groupings: the National Radical union, a new party formed by the prime minister, Karamanlis, and comprising most of the elements of the defunct Greek Rally together with some Liberals; and the Democratic Union, a loose electoral coalition of most of the other parties, ranging from the right-wing Populist party to the near-Communist E.D.A. (Union of the Democratic Left). The elections were won by the National Radical union, with 165 seats out of 300, and the new Karamanlis government took office on Feb. 29. The period which followed was marked by an intensification of party strife, the crown itself becoming involved as a result of bitter controversy as to whether the king's civil list should be increased and whether senior palace officials should be allowed to hold business appointments as well. The inability of the anti-government parties to co-ordinate their activities, however, rendered their opposition somewhat ineffectual, and the government's parliamentary majority remained unimpaired, despite a few individual defections.

The president of the German Federal Republic, Theodor Heuss, paid a state visit to Greece on May 14, the visit being returned by King Paul and Queen Frederika on Sept. 17. The king and queen also paid a state visit to France on June 5. Diplomatic relations with Rumania were re-established for the first time after World War II on Aug. 25, when an agreement was also signed in Athens regulating various economic matters outstanding between the two countries.

Relations with Turkey continued to be strained as a result of the Cyprus dispute. Inevitably, the tripartite alliance between Greece, Turkey and Yugoslavia became virtually dormant because of lack of contact and mutual consultation between two of its members; in contrast, relations between Greece and Yugoslavia became more cordial, and President Tito and his wife spent several days in Corfu in July as guests of King Paul and Queen Frederika. Karamanlis and Evangelos Averoff, the foreign minister, paid a visit to Belgrade on Dec. 4 for discussions with President Tito aimed at reactivating the tripartite treaty.

The political and diplomatic scene continued to be dominated by the Cyprus question, relations with Great Britain becoming progressively worse during the year to the extent that Greece declined the invitation to the London conference on Suez in August "in view of the conditions under which the Conference

is being convoked and the well-known circumstances prevailing in Greece today."

The deportation of Makarios III (*q.v.*), the archbishop of Cyprus, to the Seychelles Islands on March 9 led to demonstrations in Athens, Salonika and other cities, where clashes occurred with troops and police; and the Greek ambassador to London, Vasilios Mostras, was recalled on March 13. A nation-wide strike in protest at the deportation culminated in a half-hour "silent protest" during which all streets were deserted, traffic stopped and church bells tolled throughout the country. The first execution of Cypriots by the British authorities on May 10 and the deportation from London to Greece of a Greek priest, the Rev. Kallinikos Machairiotis, on June 12 produced further manifestations of popular resentment, and three persons were killed and 124 injured (59 of them police) in rioting which broke out in Athens. Athens radio broadcasts, the tone and contents of which had already drawn representations from the British government, began to be systematically "jammed" by the British authorities on March 5.

Spyros Theotokis, the foreign minister, was obliged to resign on May 27 following violent attacks by the parliamentary opposition—echoed to some extent by the Cyprus Ethnarchy council—to the effect that he was not pressing the case for Cypriot self-determination with sufficient vigour. He was succeeded by Averoff, who declared on taking office that the government would continue to give the fullest support to the vindication of the Cypriot people's struggle and would spare no effort to secure the release of the exiled archbishop of Cyprus.

Karamanlis led the Greek delegation to the UN general assembly in November, and while in the United States had talks with Pres. Dwight D. Eisenhower. Greece's recourse to the United Nations with regard to Cyprus was countered by a British complaint on the same subject, and on Nov. 14 the general assembly decided, by unanimous vote, to include the following item on its agenda: "Question of Cyprus. (a) Application, under the auspices of the United Nations, of the principle of equal rights and self-determination of peoples in the case of the population of the Island of Cyprus. (b) Complaint by the United Kingdom of support from Greece for terrorism in Cyprus."

The island of Santorini (Thera) was shaken by an earthquake on July 9, when 55% of the houses were destroyed or badly damaged, 48 people were killed and 64 were injured. The neighbouring islands of Kalymnos and Amorgos were also affected.

(See also CYPRUS; TURKEY.)

(S. L. H.)

Education.—Schools: primary (1953) 9,298, pupils (1955–56) 918,909, teachers (1953) 20,164; secondary (1955–56, including technical, 148 extension and 40 commercial schools) 469, pupils 186,556, teachers (1952–53) 6,078. Teachers' training colleges (1952–53) 14, students (average since 1950) 3,000. Institutions of higher education (1953–54) 7, students 11,711, of which 6,658 at 2 universities.

Finance and Banking.—Monetary unit: drachma (introduced on May 1, 1954, and equal to 1,000 old drachmas), with an exchange rate of dr. 30 to the U.S. \$1. Budget (1952–53 final): revenue dr. 7,020,900,000, expenditure dr. 6,632,000,000; (1954–55 est.) revenue dr. 12,069,000,000, expenditure dr. 10,361,000,000. Internal debt (June 1954) dr. 6,432,900,000; external debt dr. 2,403,000,000. Currency circulation: (March 1955) dr. 3,770,000,000, (March 1956) dr. 3,970,000,000. Deposit money: (March 1955) dr. 6,360,000,000, (March 1956) dr. 7,030,000,000. Gold holdings, central bank, (Dec. 1954) U.S. \$10,800,000, (Dec. 1955) U.S. \$10,900,000.

Foreign Trade.—(1955) Imports dr. 11,465,000,000; exports dr. 5,484,000,000. Main sources of imports: Germany 17%; Italy 11%; other continental E.P.U. (European Payments Union countries) 23%; U.S. and Canada 19%; U.K. 11%. Main destinations of exports: Germany 25%; Italy 15%; other continental E.P.U. 20%; U.K. 10%; U.S. and Canada 13%. Main exports (1955): tobacco 42%; raisins 16%.

Transport and Communications.—Roads (1953) 22,900 km. Motor vehicles in use (1954): passenger 16,600; commercial 25,600. Railways (1955) 2,700 km.; passenger-km. (1954) 874,000,000; freight, ton-km. (1954) 387,600,000. Shipping, merchant vessels of 100 gross tons and over (July 1955) 350; total tonnage, 1,245,388. Telephones (Jan. 1955) 109,700. Licensed radio receivers (1954) 507,000.

Agriculture.—Production (metric tons, 1955; 1954 in parentheses): wheat 1,336,000 (1,219,000); barley 224,000 (231,000); oats 156,000 (149,000); maize 288,000 (258,000); potatoes 438,000 (442,000); rice 61,000 (86,000); olives 496,000 (553,000); tobacco 99,500 (67,400); oranges etc. 145,000 (153,000); lemons 39,000 (41,000); cotton, lint

35,000 (42,000); cottonseed 116,000 (85,000); figs 118,000 (117,000); olive oil 115,000 (124,000); wine 3,750,000 hl. (4,230,000 hl.); raisins 100,500 (112,500); currants (1953) 77,000; sultanas (1953) 38,000. Livestock (Sept. 1955): cattle 917,000; sheep 8,738,000; pigs 603,000; horses 117,000; mules 203,000; asses 501,000; buffaloes 73,000; goats (Sept. 1954) 4,510,000.

Industry.—Fuel and power: lignite (1955) 900,000 metric tons; electricity (1954) 1,057,000,000 kw.hr.; manufactured gas (1954) 17,800,000 cu. m. (1953) 17,800,000 cu. m. (1954): bauxite 354,000; magnesite 103,000; pyrites 10,000; chromite ore (metal content) 10,800; iron ore (50% metal content) 77,160; cement 804,000; cotton yarn 23,880. Index of production (Feb. 1956; 1953=100) 125. Cost-of-living index (March 1955; 1953=100) 100.

Picture: BRITANNICA FILMS.—Greece (1955); *People of Greece* (1955).

Greenland. A large island (840,000 sq.mi., more than four-fifths covered by an ice cap), Greenland is part of the kingdom of Denmark, in the North Atlantic ocean, north-west of Iceland. Pop.: (1951 census) 24,159, distributed in settlements along the west coast except for 1,697 on the east coast; 1,269 Europeans (mostly Danes), the rest native Greenlanders (Eskimoes); (1955 est.) 26,000. Languages: Danish and Eskimo. Religion: Lutheran. Capital, Godthaab (1945 census) 970 (second governor's seat, Godhavn). Governor general in 1956, Poul Hugo Lundsteen.

History.—Difficulties in getting the necessary capital for the fishing industry and for sheep farming caused Augo Lyng, the Greenland member of the *folketing*, to propose (Oct. 18, 1956) that the United States pay an annual rent for its use of the Greenland air bases and that these payments be used as capital investment in Greenland industry. The proposal was rejected by H. C. Hansen, the Danish premier. Lyng also called for representation in the Greenland *landsraad* (local council) of the small, distant settlements of Angmagssalik and Scoresbysund on the eastern coast.

The exploitation of the lead and zinc deposits at Mestersvåg in northeast Greenland resulted in 1956 in increased shipments valued at about 10,000,000 Kr.

(See also DENMARK.)

(H. LN.)

Education.—Infant and primary schools (1953-54): 162, pupils 4,698, teachers 302. Other schools (1951): postprimary 3, pupils 71, teachers 12; technical 1, pupils 43, teachers 6; evening schools 15, pupils 500, teachers 48. Institutions of higher education 3, students 35, lecturers 6.

Finance.—Monetary unit: Danish krone, valued in 1956 at 14.477 cents U.S. Budget (1953-54; 1954-55 in parentheses): revenue 4,813,000 Kr. (4,733,000 Kr.); expenditure 35,021,000 Kr. (35,421,000 Kr.).

Foreign Trade.—(1955) Imports 78,256,000 Kr., including 64,664,000 Kr. from Denmark, 4,254,000 Kr. from the U.S. Exports 37,232,000 Kr., including 25,094,000 Kr. to Denmark, 4,157,000 Kr. to the U.S.

Agriculture and Fisheries.—Livestock (1954): sheep 21,258; poultry 2,449; horses 144; goats 14; cattle 61. Exports (metric tons, 1955): fresh fish 1,360; salted, dried and smoked fish 7,171; fish preparations 131; whale and fish oil 1,240; hides and skins 143.

Mining.—Exports (metric tons, 1955): cyrolite, crude, 41,792, including 33,512 to Denmark and 8,279 to the U.S.

Grenada: see WINDWARD ISLANDS.

Gronchi, Giovanni (188-), Italian statesman, was born at Pontedera, It., near Pisa, It., Sept. 10, the son of a bookkeeper. He was educated at Pisa university and joined the Christian Democratic movement founded in 1902 by Romolo Murci. He served in the Italian army in World War I and in 1919 he helped Luigi Sturzo to found the Partito Popolare Italiano. From 1919 he sat in the chamber of deputies and was also the secretary-general of the (Christian) Confederazione Italiana dei Lavoratori. In the first Mussolini cabinet, formed in Oct. 1922, Gronchi was undersecretary for industry and commerce. He resigned when in Aug. 1923 the P.P.I. went over to the opposition. In 1927 he retired to private life and devoted his energies to industry. Returning to politics in 1943, he represented with Alcide de Gasperi the underground Partito Democratico Cristiano in the National Liberation committee. From June 1944 to June 1946 he was minister for industry and commerce in four successive cabinets. Elected in June



PRESIDENT EISENHOWER greeting President Gronchi of Italy in Washington, D.C., during the latter's visit to the U.S. in 1956. Others shown in the photograph are Mrs. Eisenhower (second from left), U.S. ambassador to Italy, Clara Boothe Luce (centre) and U.S. secretary of state, John Foster Dulles (next to Gronchi).

1946 to the constituent assembly, he became the leader of the P.D.C. group. In April 1948 he was elected to the new chamber of deputies and on May 8 was elected speaker. He was re-elected to the chamber in June 1952, and continued to serve as speaker. On April 29, 1955, on the fourth ballot, he was elected president of the republic, receiving 658 votes out of a possible 843. From Feb. 27 to March 2, 1956, he paid an official visit to the United States and addressed the joint session of the U.S. congress; during March 3-6 he was the guest of Canada; and during April 25-27 he paid an official visit to France.

Group Insurance: see INSURANCE.

Guadeloupe. This French overseas *département* in the Lesser Antilles consists of two main and five smaller islands. Total area: 687 sq.mi. Pop. (1946 census) 278,464; (1954 census) 229,120, mainly coloured (Negro or mixed). Language: French and creole French. Religion: Roman Catholic. Chief towns (pop., 1954 census): Basse-Terre (cap.) 11,837; Pointe-à-Pitre 26,160.

Prefect (from May 1956) Guy Malines.

History.—In the elections to the French national assembly held on Jan. 2, 1950, the successful candidates were two Communists and a Radical (Pierre Monnerville).

On Aug. 11, Gen. Charles de Gaulle arrived in Guadeloupe on a visit.

On Aug. 12 a violent cyclone hit the island, laying waste the plantations and severing communications by road. Casualties amounted to 6 killed and 22 injured, with 600 houses destroyed (Hu. De.)

Foreign Trade.—(1955) Monetary unit: metropolitan French franc valued at 350 fr. to U.S. \$1. Imports 13,000,000,000 fr., including 10,000,000,000 fr. from France. Exports 11,800,000,000 fr.; almost all to countries of the French union. Principal exports: bananas 4,700,000,000 fr. sugar 5,800,000,000 fr.

Guam. Guam is the largest and southernmost island of the Marianas, lying in the Pacific ocean at 13° 26' N. lat. and 144° 39' E. long., about 5,100 mi. W. of San Francisco, Calif. 3,340 mi. W. of Honolulu and 1,500 mi. E. of Manila. Area: 206 sq.mi. Pop.: (1950 census) 59,498; (1955 est.) 36,000, excluding U.S. military and administrative personnel. Agaña is the capital with a population in 1950 of 1,330. Other important towns are

Sinajana and Inarajan. The Guamanians are Chamorros, and their religion is predominantly Roman Catholic.

History.—The platform of the U.S. Democratic party adopted at the Chicago, Ill., convention in Aug. 1956 included a plank favouring increased self-government for Guam.

Governor Ford Q. Elvidge, who was appointed in April 1953, resigned in June 1956. William T. Corbett, secretary of Guam, served as acting governor until Oct. 2, 1956, when Pres. Dwight D. Eisenhower appointed Richard Barrett Lowe, governor of American Samoa since 1953, to the office.

In 1955 and 1956 the economy of Guam continued to expand with increases in agricultural production and the establishment of new commercial and industrial enterprises. To a large extent this expansion was the result of the development of Guam as an important U.S. military base. The government played an important role in the economy through the establishment of the Guam Finance and Development agency, which makes loans to farmers and businessmen for development purposes. Out of a total of \$900,000 authorized for this purpose as of June 30, 1955, \$542,000 had been loaned.

In 1956 Guam served as the headquarters of the government of the Trust Territory of the Pacific Islands and of the U.S. air force's strategic air command in the Pacific.

Education.—In 1955 there were 22 public elementary and junior high schools with 8,707 pupils and 290 teachers; 1 high school with 1,966 students and 72 teachers; and the territorial college at Agaña with 282 students. There were also 8 parochial schools, and a missionary junior college. Instruction is given in English. About 84% of the population was literate according to the 1940 census. About 22% of the island's expenditures went for educational purposes during the 1954-55 fiscal year.

Finance.—During the fiscal year ending June 30, 1955, Guam's expenditures amounted to \$9,872,600 and revenues totalled \$10,789,700. The Bank of America operates a branch on Guam and in 1954 the Guam Savings and Loan association, formed by a group of local businessmen, began operations.

Production and Trade.—Agricultural production on 2,036 planted acres in the year ending June 30, 1954, included (in pounds): corn 665,140; citrus fruit 8,350; muskmelon 162,040; bananas 550,661; taro 196,440; sweet potatoes 63,030; cassava 142,275; pineapple 24,680; yams 32,895; watermelon 36,275; papaya 258,340; sugar cane 33,040; avocado 37,270; mango 42,335; green beans 56,426; eggplant 47,911; tomatoes 21,770; cucumber 57,820; squash 13,810; and rice, grown for the first time in many years, 13,735. The fish catch in the year ending June 30, 1955, totalled 16,000 lb. In 1954 Guam had 11,895 hogs, 6,136 cattle and 171,840 chickens.

In 1955 there were 14 industrial establishments which in the 12 months ending June 30, 1955, produced 891,437 cases of soft drinks, 5,983 tons of oil, 3,800,000 cu.ft. of oxygen gas and 48,000 cu.ft. of acetylene gas. In the fiscal year ending June 30, 1955, imports totalled \$23,131,132 and exports \$4,597,348. Guam's imports came in descending order of importance from the United States, Japan, the Philippines and the Trust Territory. Its exports went in order of importance to the Trust Territory, the U.S. and Japan.

Transportation and Communications.—There are about 80 mi. of paved highways in Guam, about 60 mi. of improved secondary roads and about 100 mi. of village streets. There are no railways, but five military airfields, two of which are major air bases.

Guam's first commercial radio station, WKUAM, began operations in 1954. Radio facilities also exist through the U.S. armed forces radio network and the Andersen field radio station. There are three newspapers, of which one is an English daily and the other two an English and a Chamorro weekly. There are 12 motion-picture theatres. (S. NR.)

Guaranteed Annual Wage: see LABOUR UNIONS.

Guatemala. A Central American republic, Guatemala is bounded by Mexico, British Honduras, Honduras and El Salvador. Area: 42,042 sq.mi.; pop.: (1950 census) 2,185,122; (1955 est.) 3,325,000. Capital: Guatemala city (1950 census) 284,276; (1953 est.): 319,379. Other urban centres (1950 census, with 1953 est. in parentheses) are Antigua Guatemala 10,996 (12,545), Chiquimula 8,840 (12,146), Cobán 7,911 (11,765), Escuintla 9,760 (12,380), Mazatenango 11,067 (13,175), Puerto Barrios 15,155 (18,193), Quezaltenango 27,672 (31,352), Retalhuleu 9,304 (11,436) and Zacapa 8,260 (11,652). Language: Spanish. Religion: predominantly Roman Catholic. President in 1956, Col. Carlos Castillo Armas.

History.—Guatemala in 1956 was faced with continuing social and economic problems and political unrest. New Year's day was marked with the police pursuing plotters who had attempted to overthrow Pres. Carlos Castillo Armas. About 4,000 leftist-led

students criticized Castillo Armas for deporting various plotters. He soon readmitted them. The year was marked by constant accusations that communists were conspiring inside the government and the armed forces. All year liberals and anti-clericals, disgruntled with the results of the complete victory the regime handed itself in the Dec. 1955 congressional and municipal elections, expressed fears that the president would become a dictator.

A new constitution and government-dominated congress began functioning on March 1, which was declared a national holiday.

The president made democratic concessions during the troubled year. Foreign and domestic criticism led congress to pass a new and more liberal press law. Castillo Armas signed the long-awaited agrarian reform law, although the distribution of public lands to peasants was slow and small-scale as in 1955. Castillo Armas also approved a new anti-communist labour code containing various grounds for firing unsatisfactory workers.

Labour remained weak and dissatisfied after two years of "liberation" government. The Inter-American Regional Organization of Workers accused the regime of misusing restrictive laws drafted to curb communists, encouraged by companies hostile to free, strong unions. In two years, only six collective bargaining agreements had been signed, five with U.S. companies. Nevertheless, despite the anti-labour climate and a two-month state of siege in mid-1956, the utility union in Guatemala City and the port workers in Puerto Barrios won pay increases from the foreign-owned companies.

Student rioting flared up in June with four killed, followed by a state of siege. Urban labour, peasants and liberals attacked upper-class clericalism and arbitrariness and government favours to the few. Guatemala continued to claim British Honduras, assailing "colonialism."

Castillo Armas inaugurated the first meeting of the Central American Committee of Industrial Organizations of the United Nations to promote regional economic development and low tariff walls. Cotton exports rose and sugar again balanced national consumption. Extraordinary activity began in oil exploration, as Guatemala approved 22 of 29 applications for oil leases in the northern wilderness. U.S. oil companies and banks showed great interest in Guatemala's petroleum prospects. In the same jungle area, the government signed contracts to sell to two U.S. companies mahogany and cedar stands on 2,800,000 ac. of rain forest; according to the contracts, five seedlings had to be planted for every log sawed. The mills were to furnish their workers with schools, housing and hospitals.

A missing link in the Inter-American highway was completed late in the year with U.S. help. The U.S. granted additional defense funds and another \$5,000,000 of economic aid. The government and the U.S. utility serving the capital jointly planned to add 50,000 kw. of hydroelectric power.

(See also HONDURAS.)

(R. HN.)

Education.—In 1953 there were 3,537 primary schools with 7,809 teachers and 191,330 pupils and 125 postprimary schools with 2,234 teachers and 17,251 pupils. University education was available at the University of Guatemala, which had 8 faculties and matriculation of 4,005 in 1954. The 1950 census showed that 72.2% of those 7 yr. and over were illiterate.

Finance.—The monetary unit is the quetzal, at par with the U.S. dollar. The 1956-57 budget (July 1-June 30) balanced revenue and expenditure at \$77,875,723. In 1954-55 revenue totalled \$76,157,900 and expenditure \$74,274,900. The national debt was said to total \$41,000,000 on June 30, 1954. Currency in circulation (Jan. 31, 1956) totalled \$51,800,000; demand deposits, \$36,100,000. National income (gross national product at market prices) was estimated at \$569,100,000 in 1954. The cost-of-living index (Guatemala city) stood at 112 in May 1956 (1953 = 100).

Trade and Communications.—Exports in 1955 (unadjusted for banana undervaluation) totalled \$98,699,900; imports, \$104,316,000. Leading exports were coffee (76%), bananas (10%), chicle (1%), essential oils (1%) and lumber. Leading customers were the U.S. (74%), the Netherlands (7%), Belgium (5%) and Germany (3%); leading suppliers, the U.S. (64%), Germany (7%), the Netherlands Antilles (6%) and Mexico (5%).

In 1953 there were 725 mi. of main line railway; freight carried totalled 980,000 metric tons in 1955. Surfaced highways totalled about 3,470 mi. In 1951. On Jan. 1, 1955, there were 9,658 automobiles, 7,646 trucks and 1,712 buses. Telephones (Jan. 1, 1955) numbered 9,043, of which 80.5% were automatic.

Agriculture.—Exports in 1955 included coffee 970,000 bags of 132 lb. each, bananas 5,298,335 stems, chicle 2,231,000 lb., essential oils 709,800 lb., lumber 7,330,000 sq.ft. Preliminary production estimates for 1955-56 included coffee 1,080,000 bags, cotton 42,000 bales of 500 lb. gross weight, centrifugal sugar 36,000 short tons, noncentrifugal sugar 60,000 tons, maize 510,000 tons. In 1954 there were 1,218,000 cattle, 435,000 pigs, 865,000 sheep and 189,000 horses.

Manufactures.—The 1953 industrial census (preliminary figures) showed 943 industrial establishments with five or more employees; they had a total of 17,637 employees. Most important were beverages, textiles, foodstuffs and clothing. Cement production totalled 79,000 metric tons in 1955, beer 11,056,100 l., plywood 6,282,716 sq.ft. Installed electric energy capacity in 1954 was 40,200 kw., about 60% hydroelectric; production (public use only) was 101,000,000 kw.hr. in 1955. (J. W. Mw.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Central America* (1944).

Guggenheim Memorial Foundation, John Simon: see SOCIETIES AND ASSOCIATIONS, U.S.

Guiana, British: see BRITISH GUIANA.

Guiana, Dutch: see SURINAM.

Guiana, French: see FRENCH GUIANA.

Guided Missiles: see AVIATION, MILITARY; MUNITIONS.

Guinea: see FRENCH UNION; PORTUGUESE OVERSEAS TERRITORIES; SPANISH COLONIAL EMPIRE.

Guinea, French: see FRENCH WEST AFRICA.

Gymnastics. The national Amateur Athletic union championships for men and women were combined with final Olympic tryouts in 1956 and provided one of the most colourful gymnastic meets ever seen in the United States. The 15-event program held at Penn State university at University Park, Pa., April 27-28 attracted 465 entries. Competition in the men's division was so keen that only two of the 1955 champions were able to repeat. They were Abe Grossfeld, unattached of Champaign, Ill., on the horizontal bar and James Sebbo of the Jersey City (N.J.) department of recreation in tumbling. John G. Beckner of the Los Angeles (Calif.) Turners captured the men's all-around laurels, scoring 105.90 points; Karl K. Schwenzfeier

of the U.S. air force was second with 102.40 points. All-around honours in the women's contests were won by Sandra Ruddick representing the Athenaeum Turners of Indianapolis, Ind. She scored 71.85 points, while Joyce Racek of the Lincoln Turner of Chicago, Ill., was runner-up with 68.10 points.

Men selected for the United States Olympic squad were John Beckner and his brother Richard Beckner; Karl Schwenzfeier Abe Grossfeld; Joseph Kotys, Cleveland (O.) Swiss Turners Armando Vega, Penn State university; Gene Wettstone, Penn State, manager-coach. Selected as alternates were William Tor Los Angeles Turners; John M. Miles, Florida State gymkhana and Charles Simms, Los Angeles Turners. Women chosen were Sandra Ruddick; Joyce Racek, Judy Hult Howe, Rocheste (Pa.) Turners; Doris Fuchs, Rochester (N.Y.) C.Y.O.; Jacquelyn Klein, Lincoln Turners, Chicago; Muriel Davis, Indianapolis Athenaeum Turners; Erna Wachtel, Chicago, manager. Alternates chosen were Ingeborg Fuchs, Cleveland Swiss Turners Louise W. Wright, Roxborough (Pa.) Turners; and Marie Hoesly Madison (Wis.) Turners. The A.A.U. championship winner were as follows:

Men's Events

All-around—John G. Beckner; calisthenics—Chick Cicio, Florida State gymkhana; long horse—Charles Simms; side horse—Joseph Kotys; parallel bars—John G. Beckner; horizontal bar—Abe Grossfeld; still rings—Richard A. Beckner; flying rings—Frederick Hoerner, U.S. Naval academy; tumbling—James Sebbo; rope climb—Robert Manning, unattached; trampoline—Ronald Munn, Nards Trampoline Club, Tex.

Women's Events

All-around—Sandra Ruddick; calisthenics—Joyce Racek and Muriel Davis; balance beam—Sandra Ruddick; side horse vaulting—Sandra Ruddick; uneven parallel bars—Sandra Ruddick; tumbling—Barbara Galleher, Dallas (Texas) A.C.

In college gymnastics, the University of Illinois (Urbana) won the Western conference team championship, and the Big Ten rulers went on to triumph in the National Collegiate Athletic association tournament at Chapel Hill, N.C., March 23-24, 1956. The Illini scored 123½ points, and Penn State, runner-up, finished with 67½ points. Army gained honours in the Eastern intercollegiate league by winning all eight of its dual meets during the season. In the Eastern individual championships, Armando Vega of Penn State won gold medals on the parallel bars and as top scorer in the all-around competition.

(See also OLYMPIC GAMES.)

(T. V. H.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Headsprings in the Gym* (1950); *Jumps and Pole Vault* (1938); *Posture and Exercise* (1941); *Weight Events* (1938).

Haiti. The western third of the island of Hispaniola is occupied by the republic of Haiti; the rest of the island comprises the Dominican Republic. Haiti's area of 10,748 sq.mi consists chiefly of mountains, some rising above 8,000 ft., with large stands of mahogany and other hard woods, and pine at the higher altitudes. Arid plateaus and slopes are sparsely settled, but the fertile valleys have the densest population anywhere to be found in the western hemisphere. The population was estimated to be 3,305,000 in 1955. The census of 1950 gave the population of the larger communities as follows: Port-au-Prince, the capital 142,840; Cap-Haïtien 24,957; Gonaïves 13,534; Jérémie 11,138; Les Cayes 11,835; and St. Marc 10,485. The population is predominantly of African stock, and only about one-twentieth are chiefly of European origin. French is the official language, and the majority speak it; but dialects of the various African tongue mixed with French are used in the villages.

President in 1956 to Dec. 6, Paul E. Magloire.

History.—President Magloire attended the meeting of American presidents at Panamá in July, and visited the United States and other countries during the year. By the winter of 1955-56 the setback caused by the great hurricane of Oct. 1954 had been overcome. For 10 years before the hurricane the average produc-



SOVIET GYMNAST Albert Azaryan posing with his medals and cups in 1956. Azaryan was proclaimed by the U.S.S.R. as the "world's gymnastic champion"

tion of coffee had been about 334,000 bags of 176 lb. each. In 1954-55, production fell to 245,000 bags; but for 1955-56, it rose to 350,000 bags. The great Artibonite irrigation project, which by 1956 had cost more than \$30,000,000, was nearing completion, calculated to be achieved early in 1957. The Frederick Snare company expected to export large quantities of bauxite in 1957. A flour mill was established with the help of the International Cooperation administration of the United States. The International Bank for Reconstruction and Development loaned Haiti \$2,600,000 to build or improve highways; the Royal Bank of Canada participated to the extent of one-sixth of the loan.

Paul E. Magloire was president until Dec. 6, 1956, completing the six-year term he began in 1950. Relinquishing the presidency on that day, although a specific provision of the constitution authorized his tenure of the presidency until May 15, 1957. Magloire turned over the office to the chief justice of the supreme court, Joseph Nemours Pierre-Louis. Acting under legislation which designated him commander of the armed forces. General Magloire attempted to quell the disorder incident to a general strike, but on Dec. 12 he left Haiti in voluntary exile, proceeding to Jamaica. The new provisional regime prepared the ground for elections in 1957 and for the termination of martial law, which in some parts of the republic had been in effect since May 1956.

(C. E. Mc.)

Education.—In 1953 urban primary schools were reported to have 2,001 teachers and 79,859 pupils and rural schools 1,514 teachers and 92,833 pupils. In addition, there were 14 national *lycées*, 19 private secondary schools and 15 professional schools with a total of 8,869 pupils. In the 1950 population census only 7.9% claimed to have more than two years of schooling, and estimates of illiteracy ranged from 85% to 95%. In the 1954-55 fiscal year 10.4% of government expenditures was for education.

Finance.—The monetary unit is the gourde, valued in 1956 at 20 cents U.S. currency, official rate. Actual government revenue in the fiscal year ending Sept. 30, 1955, was \$38,194,600 (including nonrecurring credits); expenditure was \$34,718,700. The public debt totalled \$43,360,732 on Oct. 31, 1955; the deficit in treasury general funds was \$5,548,835. The U.S. department of commerce estimated U.S. direct private investments in 1955 at \$18,000,000. The cost-of-living index (Port-au-Prince) stood at 100 in March 1956 (1953=100).

Trade and Communications.—Exports in the trade year 1955 (Oct. 1, 1954-Sept. 30, 1955) were \$34,864,000; imports were \$39,196,000. The chief exports were coffee (66%), sisal (16%), sugar (4%), cacao (3%) and essential oils (3%); leading imports, cotton textiles (15%), wheat flour (13%), iron and steel and manufactures (8%), machinery and apparatus (7%) and vehicles (6%). Leading customers were the U.S. (49%), Belgium (14%), France (14%), Italy (10%) and the Netherlands (3%); leading suppliers, the U.S. (66%), Canada (6%), Germany (4%), the U.K. (4%) and the Netherlands Antilles (4%).

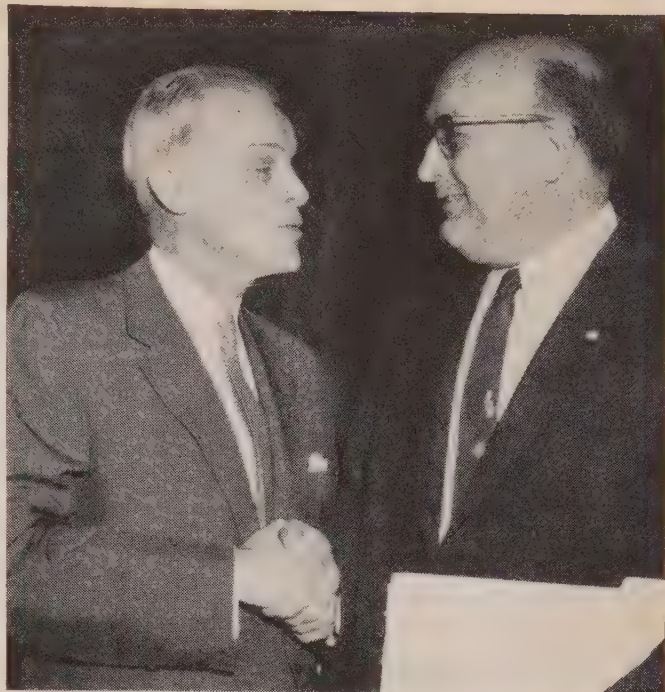
At the end of 1952 there were upward of 2,000 mi. of roads, more than half of which were unimproved earth and unsurfaced roads. There were 88 mi. of public railway and about 75 mi. of industrial trackage. On Jan. 1, 1955, there were 4,970 automobiles, 2,921 trucks and 233 buses. Telephones (Jan. 1, 1955) numbered 4,293, 91% of which were automatic and 84% of which were located in Port-au-Prince.

Agriculture.—Coffee production totalled about 735,000 bags of 132 lb. each in the 1955-56 season. Exports in the trade year 1955 included coffee 327,400 bags; sisal 31,189 metric tons; cacao 1,474 tons; raw cotton 1,351 tons; bananas 49,288 stems. Exports of essential oils included vetiver 117,530 lb.; lemon grass 52,350 lb.; and oil of lemon 2,350 lb. In 1950 there were an estimated 582,000 cattle, 1,139,000 pigs and 892,000 goats.

Manufactures.—Sugar production totalled about 65,000 short tons in 1956. In 1955, 2,890,000 yd. of cotton fabrics were produced. Installed electric energy capacity (Dec. 31, 1955) was 25,000 kw. (J. W. Mw.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Caribbean Sky Cruise* (1955).

Hall, Leonard Wood (1900—), U.S. attorney and political leader who as chairman of the Republican national committee directed the Republican campaign in the national election of 1956, was born Oct. 2 at Oyster Bay, N.Y. He took a law degree at Georgetown university in Washington, D.C., in 1920, beginning practice the next year in New York city. Hall first entered politics in 1926 as a Republican worker and was a member of the New York state assembly from 1927 to 1928, and again from 1934 to 1938. Between these terms he was sheriff of Nassau county, N.Y., for two years. From 1939 to 1952 he was a member of the U.S. house of representatives for the second New York district. As congressman he voted with his fellow Republicans on most domestic issues but frequently supported the Truman administration in its requests for additional



NATIONAL POLITICAL CHAIRMEN Paul Butler (left), Democrat, and Leonard Hall, Republican, meeting in Washington, D.C., Sept. 10, 1956, after being summoned to appear before the senate elections subcommittee to give reports of campaign contributions and spending

foreign military and economic assistance. With Sen. William F. Knowland of California he advocated stepped-up assistance for Chiang Kai-shek and his Chinese Nationalist regime. Hall resigned his congressional post in 1952 to campaign for surrogate (probate judicial officer) of Nassau county and was elected. On April 10, 1953, he was elected chairman of the Republican national committee by unanimous vote.

As Republican chairman, Hall strove to avert disunity in the party ranks and supported Sen. Joseph R. McCarthy as an "asset" to the Republicans, though deploring his tactics and his attack on Pres. Dwight D. Eisenhower after the senator's censure by the senate in 1954. Issuing frequent verbal blasts against the Democrats, Hall particularly scored their attacks on Vice-Pres. Richard M. Nixon and Secretary of Agriculture Ezra T. Benson during the 1956 election campaign.

Hammar skjöld, Dag (1905—), Swedish economist and statesman and United Nations official, was born at Jönköping, Swed., July 29, the son of a former Swedish prime minister. He graduated from Uppsala university in 1925, receiving a law degree in 1930. During 1930-34 he was secretary to the Swedish government committee on unemployment, and in 1933 became associate professor of political economics at Stockholm university. From 1936 to 1945 he was undersecretary of the Swedish department of finance, from 1941 to 1948 chairman of board of governors of the Bank of Sweden, and during 1940-48 he was a member of the Board of Foreign Exchange. He became chief Swedish delegate to the Organization for European Economic Cooperation in 1948 and was vice-chairman of its executive committee, 1948-49. Becoming assistant foreign minister in 1949, he entered the cabinet as deputy foreign minister in 1951. On April 7, 1953, he was elected secretary-general of the United Nations.

In Jan. 1956, he visited the middle eastern capitals and announced (Jan. 24) that Gamal Abdel Nasser had accepted proposals put forward by him for reducing tension in the demilitarized zone at El-Auja, on the Egyptian-Israeli border. From June 28 to July 10 Hammar skjöld visited Warsaw, Stockholm,

Helsinki, Moscow, Minsk, Kiev, Prague, Vienna and Belgrade. On his second mission to the middle east (July 19-23) he visited Jerusalem, Amman and Cairo.

The Anglo-French ultimatum to Egypt over the problem of the Suez canal began a period of intense activity and responsibility for Hammarskjöld. He had at short notice to make arrangements for the formation of a UN police force and for its transport to Egypt. On Nov. 16 he again visited Cairo and had talks with President Nasser in connection with the arrival of the force in the Suez canal area.

Hammer Throw: see TRACK AND FIELD SPORTS.

Handball. For the first time since the schism of 1951, the singles champion and other leading players of the U.S. Amateur Handball union participated in a National Amateur Athletic union tournament. The U.S. Amateur Handball union tournament was held in St. Louis, Mo., April 6-14, 1956, and the National Amateur Athletic union tournament at the New York Athletic club May 14-19. Winners of the two tournaments were as follows:

National Amateur Athletic Union

Singles

First	Jim Jacobs, Los Angeles, Calif.
Second	John Sloan, Chicago, Ill.
Third	Victor Hershkwitz, Brooklyn, N.Y.

Doubles

First	John Sloan and Phil Collins, Chicago, Ill.
Second	J. Abate and J. Ingrassia, New York, N.Y.
Third	Harry Heide and Harry Beattie, New York, N.Y.

U. S. Amateur Handball Union

Singles

First	Jim Jacobs, Los Angeles, Calif.
Second	Victor Hershkwitz, Brooklyn, N.Y.
Third	Phil Collins, Chicago, Ill.

Doubles

First	Sam Haber and Ken Schneider, Chicago, Ill.
Second	H. Dreyfus and J. Gordon, St. Louis, Mo.
Third	M. Singer, Los Angeles, Calif., and A. Stickler, St. Louis, Mo.

(FR. RO.)

Harbours: see RIVERS AND HARBOURS.

Harness Racing: see HORSE RACING.

Harriman, Averell (1891-), U.S. political leader, was born on Nov. 15 at New York city and was graduated from Yale university in 1913. Two years later he was a vice-president of the Union Pacific railroad, becoming chairman of the board of directors in 1932. During World War I he organized a shipbuilding and operating company, and in 1920 he helped found a firm of investment bankers. During the Franklin D. Roosevelt administration he was an officer of the National Recovery administration and during 1940-41 served with the National Defense Advisory commission and its successor agency, the Office of Production Management. In 1941 President Roosevelt named him lend-lease expeditor to Great Britain and later to the U.S.S.R. He was U.S. ambassador to the U.S.S.R. from Oct. 1943 to Feb. 1946, and ambassador to Great Britain from April to October 1946, when Pres. Harry S. Truman named him secretary of commerce. From 1948 to 1950 he was special U.S. representative in Europe to supervise administration of the European Recovery program; in the latter year he was named special assistant to the president and in 1951 director of the Mutual Security agency.

He was an early leading contender for the Democratic presidential nomination at Chicago, Ill., in July 1952, following President Truman's decision not to run again for the presidency. On the first ballot of the convention he received 123½ votes, and on the second 121; he then withdrew and transferred his support to Adlai E. Stevenson.

Harriman was elected governor of New York on the Democratic ticket Nov. 2, 1954. He was again considered a major can-

didate for the Democratic presidential nomination of 1956 and was in fact the principal contender with Stevenson at the Democratic convention at Chicago in August. Despite the support of former President Truman, however, his bid for the nomination failed, and he received only 210 votes to Stevenson's 905½ on the first and only ballot of the convention, Aug. 16.

Hawaii. Hawaii is an incorporated, organized territory of the United States. The territory of Hawaii consists of a group of eight large islands and numerous islets in the Pacific ocean between latitudes 18° 55' and 22° 15' N. and between 154° 50' and 160° 30' W. long. The total area of the group is 6,423 sq.mi. From southeast to northwest, the islands are Hawaii, Kahoolawe, Maui, Lanai, Molokai, Oahu, Kauai and Niihau. In addition, stretching northward beyond Niihau more than 1,100 mi., is an archipelago of rocks, reefs and shoals. Also 960 mi. south of Honolulu and included as part of the city and county of Honolulu lies Palmyra, a coral atoll consisting of 55 islets, 5 mi. long and 2½ mi. wide. The largest island in the territory is Hawaii, with an area of 4,021 sq.mi. The capital of the territory is Honolulu, situated on the island of Oahu. Honolulu is a modern city with a population of 275,393 as of July 1, 1956.

The population of the entire territory was approximately 523,359, as of July 1, 1956, exclusive of military and naval personnel. The Japanese and Caucasian groups are the largest. Other groups include native Hawaiians and part-Hawaiians, Chinese, Filipinos, Koreans, Puerto Ricans and Samoans.

History.—As a result of a citizen suit seeking to force the legislature to reapportion itself as mandated by the Hawaiian Organic act, federal Judge J. Frank McLaughlin ruled on July 20, 1956, that Hawaii would hold territory-wide elections in 1956. This decision was rendered moot when the U.S. congress enacted a law, to take effect with the 1958 elections, reapportioning Hawaii's legislature as provided by the proposed state constitution. Statehood legislation again failed to pass the U.S. congress.

A special session of the legislature, called in Sept. 1956 by Gov. Samuel Wilder King, passed a bill giving salary increases to government employees and teachers.

Employment in the territory reached its highest level in ten years with more than 200,000 persons working in the month of July. Mainland dollar earnings again showed a favourable balance of income (\$745,000,000) over expenditures (\$707,000,000). The construction industry displaced the tourist trade as third-ranking industry with a value of \$94,000,000 in 1955. Increased construction of homes, public works and hotel facilities accounted for the sharp rise in the industry. In the fiscal year 1955, 109,798 tourists spent \$55,009,000.

A new weather observatory, above the 11,000 ft. level on the slopes of Mauna Loa on the island of Hawaii, was used to study Mars in its September transit. It was expected that the observatory would be utilized for scientific observations during the International Geophysical year in 1957-58.

As a result of the Nov. 6, 1956, election, John A. Burns, Democrat, was elected delegate to the U.S. congress. In the 1957 session of the legislature there would be 12 Democrats and 3 Republicans in the senate and 18 Democrats and 12 Republicans in the lower house.

Education.—As of Sept. 1956 there were 205 public schools including kindergartens and schools through the 12th grade. These public schools had an enrolment of 124,873. The number of teachers and principals in the public schools was 4,495. Expenditures for public instruction for the 1955-56 fiscal year amounted to \$28,979,897.

The territory operated one prison system with three units, two of which were minimum security projects. In addition, there were two training schools. In 1955-56, the average number of inmates of the prisons was 573; training schools, 151. Expenditures for the same period were \$984,950 for the former and \$406,759 for the latter.

Public Assistance.—Table I shows the average number of cases assisted monthly and expenditures, exclusive of administrative costs, during the

Table I.—Public Assistance in Hawaii

Type of assistance	Average number of cases assisted monthly during 1955-56	Average monthly payment, 1955-56
Old age	1,731	\$ 37.21
Blind	108	48.37
Dependent children and their parents	3,211	87.82
Children under foster care	782	43.71
Disabled persons	1,309	49.59
General assistance	3,488	54.20
Total expenditures for assistance.		\$6,676,161

fiscal year 1955-56 by the territorial department of public welfare.

During the same period, the territorial department of health allocated \$956,434 to the counties for hospital and medical aid to the indigent and medically indigent.

Gross unemployment benefit payments, including those to veterans and federal employees, totalled \$3,586,962. Claims allowed numbered 183,815.

Transportation and Communications.—There were 151,707 taxable passenger cars in the territory on Dec. 31, 1955. The federal aid highway system covered 1,139 mi. in 1956. During the year ended June 30, 1956, 1,045 overseas vessels arrived and departed from Honolulu harbour. Overseas incoming freight at this port was 2,753,591 tons; outgoing freight, 1,075,103 tons. There were 13 airports in operation in the 1955-56 fiscal year. In Dec. 1955, 143,063 telephones were in use in the territory. There were 3 commercial radio stations in the territory and 3 television stations in Honolulu with 3 satellite stations on neighbouring islands.

Banking and Finance.—In the calendar year 1955, bank clearings amounted to \$2,838,904,247. Five banks, operating 50 branches, had deposits totalling \$395,392,311 and their assets were \$428,471,221. Territorial government general fund expenditures for the fiscal year 1955-56 amounted to \$60,189,667; the bonded indebtedness of the territory was \$59,911,000. The net assessed valuation of real property was \$1,017,598,990 for the calendar year 1956; the average, unweighted rate of real property tax was \$2.88 per \$1,000. For the fiscal year 1955-56, territorial general fund revenues were \$62,129,506 including transfers and repayments.

Production.—Sugar is Hawaii's principal industry and the value of 1,140,122 tons of sugar produced in 1955 was approximately \$145,500,000 including the value of by-products. About 218,819 ac. were utilized for sugar-cane production. In 1954-55 pineapples were grown on 77,000 ac. of land to produce a pack of 29,413,000 cases of canned fruit and juices valued at more than \$110,000,000. The 1954-55 coffee crop was 9,940,000 lb. valued at \$6,411,000. The value of fruits, vegetables and other commercial crops produced in 1955 was about \$7,153,000, while the value of livestock and poultry products was \$26,065,000. During the fiscal year 1955-56, the commercial fish catch totalled 14,807,076 lb. valued at \$8,959,425. (S. W. K.)

Mineral Production.—The accompanying table shows tonnages and value of those mineral commodities produced in Hawaii in 1953 and 1954 whose values exceeded \$100,000.

Table II.—Mineral Production of Hawaii

	1953		1954*	
	Quantity	Value	Quantity	Value
Total		\$3,332,000		\$3,596,000†
Gold	7,431	223,575	8,000	252,000
Lead and gravel	111,000	157,000	119,000	319,000
Iron ore	1,300,000	2,654,000	1,485,000	2,993,000
Other nonmetals . . . . .	...	190,002	...	58,000

* Preliminary.
† Total has been adjusted to eliminate duplication in the value of clay and stone.

Source: U.S. Bureau of Mines.

ENCYCLOPÆDIA BRITANNICA FILMS.—*Hawaii* (1955); *Hawaiian Native Life* (1940).

Hay and Pastures. The 1956 U.S. hay crop of 110,383,000 tons was the second largest on record, exceeded only by the 112,782,000 tons of 1955, but 6% above the 103,648,000-ton average for 1945-54. Yields averaged 4.46 tons per acre as compared with 1.49 tons in 1955 and 1.39 tons for the previous decade.

Total acreage, somewhat reduced by diversion to the acreage reserve of the soil bank, was 107,707,000 ac. as compared with 112,782,000 ac. in 1955 and an average for 1945-54 of 103,648,000 ac. A record 61,031,000 tons of alfalfa were harvested as compared with 59,195,000 tons in 1955 and 41,315,000 tons average for 1945-54. Lespedeza provided 4,670,000 tons as compared with 4,708,000 tons in 1955 and an average crop of 6,354,000 tons. The crop of clover, timothy and mixed hays was 20,624,000 tons as compared with 24,174,000 tons in 1955 and an average of 29,509,000 for 1945-54. Wild hay, primarily a product of the Dakotas and Nebraska, was 8,537,000 tons, down from 10,977,000 tons in 1955 and 11,849,000 tons for 1945-54.

Wisconsin was the leading producer (8,036,000 tons), followed by Minnesota and California. Prices strengthened as the

season advanced, but in September averaged \$20.70 per ton, only slightly more than in 1955. Substantial amounts were utilized in the government-subsidized hay program for nearly 500 drought-stricken counties.

Pasture.—Forage crops made a slow and disappointing start in most sections under restraint of cold and dry weather; in May the average condition was 68%, as compared with 79% a year earlier and 82% for 1945-54. Grazing was delayed, but ample midsummer rainfall provided lush pasturage for a prolonged season in portions of the midwest and mountain area. West of the Mississippi, the season was unfavourable in many areas from the beginning and deteriorated into stark and extreme drought over wide areas late in the summer and autumn. In October pasture condition averaged 61% of normal, as compared with 66% at the same time in 1955 and an average 74%. Emergency grazing of soil bank acres contracted to the government was permitted in about 700 counties in 12 states.

Hay and Pasture Seeds.—Production of 26 legume and grass seeds in 1956 was estimated at 675,000,000 lb., 22% less than in 1955 and 19% below average. Carry-over stocks of 38 legume and grass seeds in off-the-farm positions produced prior to 1956 amounted to 244,566,000 lb. on June 30, 20% more than in 1955 and 18% above the 1947-51 average. Alfalfa approximated the 1955 level, which was 3¼ times the average level. Clovers and grasses as groups were about one-third larger than in 1955 and twice the average.

The 1956 harvest of several fescues was smaller than in 1955, but the bent grass seed crop was a record large one. The alsike-clover seed crop of 9,260,000 lb. was the smallest on record; about 3,475,000 lb. were imported from Canada in 1955-56. The red-clover seed crop of 78,917,000 lb. was 4% less than in 1955 and 16% below average; 6,063,000 lb. were imported in 1955-56.

European grass seeds were in surplus supply in 1955-56, the result of 52% larger production in 1955 over 1954. Prices declined sharply.

(J. K. R.)

Heald, Henry Townley (1904-), U.S. educator, resigned as chancellor of New York university in 1956 to accept the presidency of the Ford foundation. Born at Lincoln, Neb., on Nov. 8, Heald graduated from the State College of Washington in 1923 and took a master's degree in engineering at the University of Illinois two years later. From 1923 to 1927 he was a practising engineer, and in 1927 joined the staff of Armour Institute of Technology in Chicago as an assistant professor of civil engineering, advancing to dean of the college and then to president in 1938. When Armour was merged with Lewis institute in Chicago to form the Illinois Institute of Technology in 1940, Heald became president of the consolidated institution.

His administration was noted for a great increase in enrolment and physical assets, and for his personal leadership of slum clearance projects on Chicago's south side.

In 1951 Heald was elected the ninth chancellor of New York university, taking office the following February. Under his four-year administration, the university's endowment funds increased by approximately \$5,000,000; Heald also continued his activities for better housing in New York city and on a national basis. On July 10, 1956, trustees of the Ford foundation elected him president of that organization to succeed H. Rowan Gaither, Jr., effective Oct. 1, 1956.

Health, Education and Welfare, U.S. Department of: see DRUG ADMINISTRATION, U.S.; EDUCATION; GOVERNMENT DEPARTMENTS AND BUREAUS, U.S.; PUBLIC HEALTH SERVICE, U.S.; SOCIAL SECURITY.

Health, Industrial: see INDUSTRIAL HEALTH.

Hearing. Progress in the field of hearing is considered under three headings: research, therapy and rehabilitation. In basic research the studies on neurophysiology of hearing were of particular interest during 1956. The bundle of nerve fibres which had been traced from the brain stem of the opposite side out to the region of the sense organ was studied further and appeared to terminate in the region of the sensory cells. Evidence indicated that this bundle carries impulses to the cochlea, probably to the sensory or hair cells.

The sensory cells are stimulated by the sound waves entering the inner ear and in turn initiate the nerve impulses which pass along the afferent nerves to the brain. The presence of nerves which carry impulses to these sensory cells poses the question as to their function.

There was improvement in the surgical treatment of conduction deafness resulting from otosclerosis and in the surgical repair of defects of the conduction mechanism in the middle ear caused by inflammatory disease.

The fenestration operation continued to be a reliable and predictable means by which the hearing in cases of stapes ankylosis caused by otosclerosis could be brought up to a practical level. In less than 5% undesirable results, such as annoying dizziness or failure to obtain hearing gain or possibly a depression of hearing, occurred. In 15% to 20% the improvement following operation receded to an unsatisfactory level within a two-year period.

Progress was made in improvement of the operation for mobilizing the stapes in cases of ankylosis resulting from otosclerosis. The simplicity of this procedure from the patient's point of view had been mainly responsible for its popularity despite the lower percentage of satisfactory results than obtainable by fenestration. This operation, which was performed before the year 1900 and was given up for indefinite reasons but probably because of the danger of infection, was further improved. In carefully selected cases the mobilization operation now gave a satisfactory improvement in hearing in more than 50% in the hands of some operators. The duration of this improvement was still uncertain, but the usefulness of the procedure seemed to be further established. The increasing percentage of good results was attributed partly to new techniques but also partly to skill developed by the operators. More time was required to evaluate this operation.

The surgical procedures under the name "tympanoplasty," by which defects of the conducting mechanism in the middle ear can be partly restored to function and at the same time inflammatory disease eradicated, were further developed. This type of therapy resulted mainly from the impetus given to exact surgery on the ear by the work of J. Lempert. Further developments demonstrated possibilities for improving by surgical means many cases in which hearing had been damaged by inflammation and which formerly were considered as beyond any possibility of improvement.

The methods which were developed for this work entailed time-consuming and painstaking care on the part of the surgeon, but possibilities for improvement in hearing were well demonstrated. These advances in the surgical treatment of deafness made it possible for hearing to be restored in large numbers of persons who in the past would have been forced to depend upon the electrical hearing aid.

In the field of rehabilitation, advances were made in the design of hearing aids and in facilities for educating those with permanent severe hearing loss. With the increase in these facilities it seemed possible that in the near future all children with incurable hearing defects could receive adequate education and rehabilitation. (See also EAR, NOSE AND THROAT, DISEASES OF.)

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ENCYCLOPÆDIA BRITANNICA FILMS.—*Ears and Hearing* (1950).

Heart and Circulatory Diseases.

Congenital heart disease continues to receive intensive study during 1956, and techniques of diagnosis were further refined and perfected so that a precise appraisal of varied complicated structural congenital abnormalities of the heart and great vessels could be attained. Only a few years before such precision in diagnosis would have been impossible. Surgery for congenital heart conditions continued likewise to forge ahead. No longer did surgeons have to rely only upon blind methods of repair and correction of defects within the heart, attempted while the heart was still beating and full of blood. Instead, there was increasing resort to the use of mechanical pumps of varying design to take over the work of the heart so that empty of blood, it could be opened, inspected directly and suitable repair of defects accomplished. This technique was often accompanied by cooling of the body to reduce the demand for circulating blood while the heart itself was being by-passed. In some instances, the heart had been stopped briefly as the result of the injection of solutions containing potassium (alone or in combination with other substances) or of the drug acetylcholine. Not all patients with congenital heart disease could be helped despite this perfection of diagnostic methods and operative techniques, but it was clear that more and more cases previously considered hopeless were within the reach of help or cure.

Rheumatic Fever.—The prevention of rheumatic fever also received great emphasis. The American Heart Association supported a vigorous national program in the United States to prevent patients known to have had one attack of rheumatic fever from having recurrences by preventing streptococcal infections, particularly sore throats and tonsillitis caused by the haemolytic streptococcus bacteria. It had long been known that the daily long-term use of sulfa drugs would effectively keep most of these patients free from such infection, and it appeared that penicillin was even superior to the sulfa drugs as a prophylactic agent. Clinics and private physicians were urged to co-operate in this program. The prevention of even a first attack of rheumatic fever by prompt and adequate treatment with penicillin of all haemolytic streptococcal infections was under study. A difficulty here was the fact that not all such infections could be clinically recognized, some being relatively mild and difficult to detect. It appeared that much had been done to minimize the threat of rheumatic fever, but it was much too early to say that the disease was on the verge of extinction.

The treatment of cases of acute rheumatic fever with hormones was reported by May G. Wilson and Wan Ngo Lim to decrease the incidence of residual heart damage significantly as compared with that encountered in patients treated with conventional methods. In this regard, the importance of prompt use of such agents early in the course of the disease was stressed.

Surgeons were increasingly active in searching for new ways to improve the function of hearts already damaged by rheumatic fever. There was no operation suggested or available to make the weakened heart muscle itself stronger, but by opening up heart valves which were partially fused closed, the muscle could be relieved of the burdens of mechanical blocks. The operation for relieving the block of one valve, the mitral valve, had been shown to be of established value, and this could be done by the surgeon's inserting his finger into the beating heart to open the valve and allow more normal function. A similar partial closure of another valve, the aortic valve, had usually resisted the vari-

techniques proposed, but during the year C. W. Lillehei and his associates proposed correcting the difficulty by opening the valve under direct vision, much as was being done for congenital heart conditions. This method was found promising and received further trial during the year.

High Blood Pressure.—The treatment of high blood pressure was the subject of many clinical and laboratory investigations, but there was no radical change from the previous few years. Surgery continued to be reserved for a relatively small group of patients, and those who needed treatment in most instances were advised to try one or more of the drugs known to have some favourable moderating influence. The most powerful drugs had their drawbacks and their hazards, and no easy or invariably satisfactory means of controlling elevated blood pressure levels and the basic process which produced them was yet at hand.

J. J. Genest and his associates measured the amount of one hormone from the adrenal gland, aldosterone, appearing in the urine of patients with high blood pressure and concluded that the adrenal glands of such persons seemed to secrete relatively large amounts of aldosterone as compared with normal subjects. Aldosterone seemed to be one of the most important factors involved in the handling of salt in the body.) This finding by Genest, which must be confirmed, served as another useful clue to the eventual understanding of the nature of the common ("essential") type of high blood pressure, the cause or causes of which still remained a mystery.

Coronary Heart Disease.—Coronary heart disease, one type of arterial blood vessel disease of atherosclerosis, was also approached from many angles. Subjects under study were numerous, among them heredity, body build, body fatness, diet, hormones and particularly the importance of sex-linked differences, high blood pressure, physical activity, the psyche, local factors in blood vessel walls and the role of blood clotting. In the past 30 years, much investigative work had been done using various species of animals to reproduce a counterpart of human atherosclerosis. The year 1956 saw increasing attention paid to the study of this problem, especially coronary artery disease, in large population groups all over the world. It was hoped to establish a better understanding of the differing incidence of coronary disease in various countries and economic groups. The preliminary data collected hinted strongly that one key element was the amount of fat taken in the diet over a period of years. However, there was as yet no convincing evidence that coronary

disease could be prevented by a low fat diet or its course modified by adopting such a routine. The possibility of altering blood fats, notably cholesterol, by adding to the diet a particular vegetable fat, sitosterol, was investigated and offered some promise of effectiveness in this regard.

The diagnosis of coronary heart disease could not be established in human beings without the appearance of symptoms or typical changes in the electrocardiogram. The diagnosis in actual cases of coronary thrombosis with death of heart muscle cells was made easier, though, by the development of a blood test for an enzyme, transaminase, released from the damaged heart, and numerous reports confirmed the usefulness of such a method.

Methods of caring for patients with attacks of coronary thrombosis did not change greatly, although there was a tendency to allow such persons to spend a shorter time in bed than hitherto. The over-all duration of convalescence was not significantly altered, however. Attempts by surgeons to improve the blood supply to the hearts of such patients by operation continued to be controversial. Harold Feil and his associates reported an evaluation of 63 patients operated upon by techniques devised by Claude Beck and concluded that more control studies and long-term follow-up would be necessary before such procedures could be accepted for general use.

(See also EPIDEMIOLOGY; RHEUMATIC DISEASES; SURGERY.)

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Hebrew Literature: see JEWISH LITERATURE.

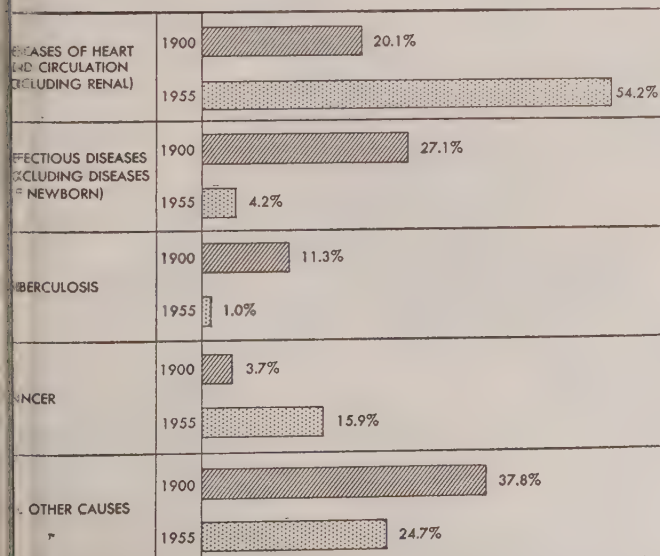
Helicopter: see AVIATION, MILITARY; CIVIL AERONAUTICS ADMINISTRATION.

Highways: see ROADS AND HIGHWAYS.

Hinschelwood, Sir Cyril Norman (1897–), British chemist, was born at London, June 19. He was awarded the 1956 Nobel prize for chemistry, jointly with Nikolai Semenov (*q.v.*), for his work on the kinetics of chemical reactions.

He was educated at Westminster City school and at Oxford, where he held in succession fellowships at Balliol, Trinity and Exeter colleges. From 1937 he was Dr. Lee's Professor of Chemistry in the University of Oxford, and his other appointments included those of chairman of the Fuel Research board, membership of the Scientific Advisory council of the ministry of fuel and power and of the Advisory Council on Scientific Policy. Elected a fellow of the Royal society in 1929 at the age of 31, he was awarded its Davy (1942) and Royal (1947) medals and was elected president of the society in 1956. During 1946-48 he was president of the Chemical society.

Hinschelwood's early studies dealt with the kinetics of molecules, but from about 1946 onward he investigated the chemical changes of the bacterial cell and sought to explain in physico-chemical terms the biological responses of bacteria to changes in their environment. He claimed to show that more or less permanent changes in resistance to a drug could be induced in bacterial cells by prolonged exposure to a drug, as a result of a change in the enzyme patterns of the cell impressed upon them by the drug. These researches were of great practical as well as theoretical importance, especially in regard to the development of "re-



PRINCIPAL CAUSES OF DEATH, 1900 and 1955, shown in percentage of total deaths for each year. (Source: National Office of Vital Statistics)

sistance" in bacteria which are subjected to the action of chemotherapeutic agents and antibiotics. His publications include *The Kinetics of Chemical Change* (4th ed., 1940) and *The Chemical Kinetics of the Bacterial Cell* (1946). Hinshelwood was knighted in 1948 and honoured by many universities and scientific societies.

Hispaniola: see DOMINICAN REPUBLIC; HAITI.

Hockey, Field. Men's interest in the sport gained considerably in the United States during the Olympic year of 1956. The Field Hockey Association of America enjoyed its busiest campaign in many seasons and the title was shared by Westchester, N.Y., and New York, N.Y., after the teams battled to a 3-3 draw in the championship play-off at Greenwich, Conn., June 10. The second annual two-day invitation tournament was held at Greenwich May 19-20. The Toronto gymkhana representatives won the event by beating the Westchester club, 3-1. The American Olympic squad of 16 members was chosen on Sept. 17. The roster included four players from the 1948 team, Kurt Orban of the North Jersey team, Harry Marcopolos and Bill Stude of Baltimore, Md., and Felix Ucko of New York city.

A highlight of the women's season was the tour made by a United States squad through Australia and New Zealand. The group made a creditable showing in the international tourney held at Sydney (Austr.) university. The U.S. Women's Field Hockey association, at the conclusion of its tournament held Nov. 24-26 in 1955, picked its All-America teams. The first 11 was made up of Betty Shellenberger, Anne Volp, Beth Ralph, Joan Edendoron, Rosemary Denniken, Alice Willetts, Ruth Heller, Mary Fetter and Jennifer Price, all from the Philadelphia, Pa., area,

CLUTCHING THE SCREEN. referee Frank Udvari attempts to stay out of the way as players converge on the puck during action in the semifinal game of the Stanley cup play-offs between the Detroit Red Wings and the Toronto Maple Leafs, March 20, 1956. In the final play-offs, the Montreal Canadiens beat Detroit to win the cup

Angela Geraci, Southeast, and Helen Gibson, New Atlantic.
(T. V. H.)

Hockey, Ice. The long reign of the Detroit Red Wings professional hockey rulers came to an end in 1956. The Wings, who had won the National league title for seven consecutive seasons, finished second to the Montreal Canadiens in the regular season, and then were routed by Montreal, 4 games to 1, in the final play-offs for the Stanley cup. The Canadiens rallied for four goals in the last period to capture the series opener, 6-4, on their home ice on March 31. A crowd of 13,977 saw Jean Beliveau pace the winners' attack with a pair of goals. Montreal won the second contest, 5-1, at the Forum on April 1 as Jacques Plante, goalie, starred. When the play-offs shifted to Detroit on April 5 the Red Wings triumphed 3-1, with deciding third-period goals by Ted Lindsay and Gordie Howe. With Beliveau scoring two goals and Plante again shining on defense, the Montreal six shut out their rivals, 3-0, on April 10 to move within one victory of hockey's biggest prize. The play-offs shifted back to Montreal on April 10 and the Canadiens won the cup that Detroit had held for two straight seasons by beating the Wings, 3-1. Beliveau, Maurice Richard and Bernie Geoffrion scored goals for the victors. Plante again starred defensively, blocking 25 of 26 shots fired at him.

Montreal, coached by Hector (Toe) Blake, advanced to the cup finals by eliminating the New York Rangers, 4 games to 0, in the semifinal round. The scores were 7-1, 2-4, 3-1, 5-3, 7-0. Detroit reached the ultimate round by taking its series with the Toronto Maple Leafs, 3-2, 3-1, 5-4 in overtime, 0-2 and 3-1.

The National league's tenth annual All-Star game, played at Montreal on Oct. 9, 1956, resulted in a 1-1 tie. The contest brought together the Canadiens and an all-star group chosen from the other five teams in the league. A crowd of 13,097 paid



28,261, a record sum for the All-Star game, to see the exhibition. Maurice Richard scored for the league champions at 14 min. 38 sec. of the second period, and Ted Lindsay of Detroit evened the count for the All-Stars at 18 min. 48 sec. of the same session.

Beliveau, the Canadiens' outstanding centre, won the Art Ross trophy as leading scorer during the regular league campaign. Beliveau set two records—most goals for a centre, 47, and most points for a centre, 88. Bert Olmstead of Montreal established a new record for assists with 56. The Canadiens' goalie Jacques Plante was awarded the Vezina trophy, given annually to the regular goalie least scored on. Glenn Hall, young goal tender of the Detroit Red Wings who recorded 12 shutouts during the season, was named as the outstanding rookie for the 1955-56 campaign and received the Calder Memorial trophy. Doug Harvey of Montreal won the James Norris trophy for the second straight year. The prize was presented to the regular defense man who throughout the season demonstrated the greatest all-around ability at his position. Earl (Dutch) Reibel, Detroit centre, received the Lady Byng award given each year to the player who best combined sportsmanship and playing ability.

The National Hockey league made one rule change in 1956, adopting a regulation providing for the immediate return to the ice of a man serving a minor penalty if the opposing team scored a goal. Under the former rule the penalized man sat out his minor penalty for the full two minutes.

The New Haven (Conn.) Blades defeated the Clinton (N.Y.) Comets, 4 games to 1, in the Eastern leagues cup play-offs. It marked the first time in the hockey history of the Connecticut territory that a New Haven team won the league title and the play-offs. The postseason series in the American league was annexed by Providence (R.I.), champion in the regular campaign, which beat out Cleveland (O.), 4 contests to 0.

National Collegiate Athletic association laurels were retained by the University of Michigan sextet when it conquered Michigan Tech, 7-5, at Colorado Springs, Colo., on March 17. The victory marked the fifth time in the last eight tournaments that the Wolverines took the title final. Harvard captured Ivy league honours for the third season in a row, winning seven of its eight games. Bill Harrison of Clarkson (Potsdam, N.Y.) received the Spencer Penrose trophy as 1956 College Coach of the Year. His team went through a 21-game schedule undefeated. The Detroit Arrowsmiths won the national junior championship of the United States by defeating Sault Ste. Marie (Mich.), 3-1.

(T. V. H.)

Hoffman, Paul Gray (1891-), U.S. industrialist, was born on April 26 at Chicago, Ill., and studied at The University of Chicago. In 1911 he became a salesman for a Studebaker automobile dealer in Los Angeles, Calif., and later was sales manager and then district branch manager for the Studebaker corporation in that city. After serving in World War I as an artillery officer, he bought the Studebaker tail branch in Los Angeles and in 1925 became vice-president of the Studebaker corporation at South Bend, Ind. In 1933 he had another vice-president successfully reorganized the corporation as receivers, and he was president from 1935 to 1948. One of the founders of the Committee for Economic Development, Hoffman was chairman of that organization's board of trustees from 1942 to 1948. On April 5, 1948, Pres. Harry S. Truman appointed him administrator of the Economic Cooperation administration, and he supervised the European Recovery program until his resignation on Sept. 30, 1950. Shortly thereafter he was named president of the Ford foundation.

Hoffman was one of the earliest supporters of Dwight D. Eisenhower for the Republican presidential nomination in 1952.

On Feb. 4, 1953, he resigned as president of the Ford foundation to return to the Studebaker corporation as chairman of its board of directors. When Studebaker merged with the Packard Motor Car company in 1954, Hoffman was named board chairman of the new company. On July 13, 1956, Pres. Eisenhower named him a delegate to the United Nations general assembly, convening in Nov. 1956.

Hogs: see LIVESTOCK.

Holland: see NETHERLANDS.

Home Building, Federal: see HOUSING.

Home Economics. Membership in the American Home Economics association in 1956 included 23,520 professional memberships, 435 college clubs, 114 homemaker groups and 4 affiliated foreign associations. The association granted 2 fellowships for graduate study and 12 fellowships and scholarships to assist students from abroad to study home economics at U.S. colleges and universities.

During the year the association conducted its annual meeting and exposition and, in co-operation with the Canadian Home Economics association, began to make plans for the ninth International Congress on Home Economics which was to be held on the campus of the University of Maryland in the summer of 1958.

The members of the association kitchen-tested and edited recipes for *Favorite Recipes From the United Nations*, published by the United States Committee for the United Nations.

Home Economics Research.—Space requirements for efficient home canning and for storage of household textiles were determined at the Beltsville laboratories as part of a co-ordinated housing research program with the state agricultural experiment stations. Experiments to determine the most energy-saving heights for ovens were completed. Results from this research on energy and space requirements were incorporated in an energy-saving kitchen-workroom designed and built at the Agricultural Research centre.

Research was completed on the ability of detergents to remove soil from various kinds of fabrics under different laundering conditions and the effect of the detergent on certain fabric properties. A guide to homemakers in selecting detergents was issued.

Findings were brought together from surveys of family clothing practices made in three types of communities—a northern and a southern city and a northern farming area. The report gave information on clothing practices such as number of garments owned, bought ready-to-wear in a year, acquired as gifts, hand-me-downs, made over or made at home, and amounts spent for clothing. Estimates were included of the extent to which income, age of person and size of family affect clothing practices.

Nutritionists developed a reference publication for nutrition teachers. The daily food plan contained in this publication accounted for most recent research findings on human nutritional needs, nutritive value of foods and food consumption habits.

Preliminary findings from a nation-wide food consumption survey made in 1955 were issued and additional reports were planned for 1957.

Agricultural Experiment Stations.—The research program at the agricultural experiment stations in the 48 states, Alaska, Hawaii and Puerto Rico in 1956 served many interests of the home and family.

Foods of better quality resulted from research to improve production and marketing practices. New and improved food products were developed, as well as guides for preservation and utilization of foods in the home. Nutrition investigations provided basic information on human nutritional requirements, on the role of nutrients in serving the body's needs and on the value

and interrelationship of different foods in supplying essential nutrients. Studies of farm family spending provided a background toward improving family diets and levels of living at various incomes.

Guides for the improvement of rural housing were developed through researches on space standards and functional designs and arrangements for home storage and activities; construction methods and utilization of materials; farm home utilities and safety; influence of geography and environment on housing design; and housing needs in relation to family composition and economic means.

Research on home equipment design and performance and on work simplification in household tasks provided help in problems of home management. Co-operative regional researches dealt with homemakers' problems in the selection, use and care of clothing.

Home Economics Extension Service.—A major emphasis in home economics extension work throughout the country in 1956 was the field of family economics. Extension teaching emphasized managing time, energy, money and the skills of family members to encourage growth of each family member and aim toward a happy and healthful home life.

Approximately 3,586 white and 421 Negro home demonstration agents estimated that their work reached more than 6,133,846 families in 1956. Of these, more than 2,285,000 were farm families, about 1,438,400 were nonfarm and 2,410,400 were urban. The number of volunteer leaders actively engaged in forwarding the home demonstration program was 720,000. There were 66,459 home demonstration groups with a membership of 1,443,000.

Nearly 4,362,000 families were helped to improve their family food and nutrition and more than 7,954,000 were assisted with consumer information on agricultural products. The program helped 1,649,000 families to adopt better health and sanitation practices. Families assisted with housing totalled 1,625,000, and those assisted with home furnishings and equipment numbered more than 2,351,000.

Land-Grant Colleges.—Those persons in charge of resident instruction, research and extension home economics in the land-grant colleges comprise the membership of the home economics division of the American Association of Land-Grant Colleges and State Universities. During 1956 the division concentrated on the home economics curriculums in land-grant colleges. It discussed home economics implications of the program of the Commission on the Education of Women of the American Council on Education, and of research studies on college curriculums under way in several institutions. The extension section of the home economics division studied the training of personnel for extension work.

Since many of the land-grant colleges have co-operative programs with institutions in other countries, the division studied the problem of international co-operation as it relates to home economics.

Public Schools and Colleges.—Enrolment in home economics classes in junior and senior high schools during 1955-56 remained about the same as in 1954-55. Part-time and evening classes for adults continued to be in demand as a part of the public school homemaking program. A wide variety of courses was offered in the secondary schools both for adult groups and for boys and girls in the day school program. In many localities where special adult classes could not be conducted, informal help was provided through homemaking problems clinics or workshops, open house days at school and educational programs for homemakers on radio and television.

Membership in the Future Homemakers of America and New Homemakers of America, national organizations of high school home economics pupils, increased about 5%. In 1955-56 there



SOLAR STOVE used in Japan in 1956 utilizes the sun's rays by concentrating them in the manner of a magnifying glass onto a central point. As long as the sun shines, the stove, built of 36 mirror plates and weighing 250 lb., produces enough heat to cook a meal

were 482,987 F.H.A. and N.H.A. members in 10,750 local chapters. Throughout 1956 the F.H.A.-N.H.A. chapters sponsored activities to promote individual development, better family living, school and community improvement and international good will.

There were approximately 500 colleges granting degrees in home economics. Approximately 81,000 major and nonmajor students were enrolled in home economics courses in colleges, universities and junior colleges. The number of degrees granted to home economics majors were: bachelor's, 7,426; master's, 809; and doctor's, 54. Special attention was given during the year to improvement of college teaching in textiles and clothing and in foods and nutrition, and to planning for space and equipment for colleges.

Teacher supply in secondary schools and colleges continued to be below the demand.

Home economics graduates found employment and professional careers in such fields as nursery school work, school lunch management, fashion and merchandising, dietetics and home service work with the utility companies as well as in teaching extension service and research.

(See also AGRICULTURAL RESEARCH SERVICE.)

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Publications of the Home Economics Branch, U.S. Department of Health, Education and Welfare, Office of Education: "Planning Space and Equipment for Home Economics in Colleges and Universities," *Misc. No. 5*; "Home Economics in Degree-Granting Institutions," *Misc. 2557*, revised 1956; "Nondegree Home Economics Offerings in Higher Institutions," *Misc. 3380*, revised 1956. (K. Gr.)

ENCYCLOPEDIA BRITANNICA FILMS.—*Arranging the Buffet Supper* (1955); *Dinner Party* (1955); *Foods and Nutrition* (1939); *Fundamentals of Diet* (1943); *Home Cookery of Fish* (1946); *How to Improve Your House* (1945); *Principles of Baking* (1943); *Principles of Cooking* (1943); *Principles of Home Canning* (1944); *Sewing* (1953).

Home Furnishings: see FURNITURE INDUSTRY; INTERIOR DECORATION.

Honduras. A republic of Central America, Honduras is bounded by Guatemala, El Salvador and Nicaragua. Area: 43,277 sq.mi. Pop. (1950 census): 1,368,605, including approximately 35,000 tribal Indians; (1955 est.) 1,660,000. Capital: Tegucigalpa, pop. (1950 census) 72,385. Other principal cities (1950 census) are San Pedro Sula, 21,139; La Ceiba, 16,645; Tela, 12,614; and Puerto Cortés, 12,228. Language: Spanish. Religion: predominantly Roman Catholic. President in 1956: Julio Lozano Díaz (until Oct. 21).

History.—On Oct. 21, 1956, Honduras experienced its 135th revolution, fortunately without bloodshed. A junta composed of three officers, Gen. Roque J. Rodríguez, Col. Héctor Caraccioli, and Maj. Robert Gálvez Barnes, quietly took control of the government after inducing *de facto* Pres. Julio Lozano Díaz to resign.

Lozano Díaz had assumed power when a formula was conceived to govern the country following the indecisive elections of 1954 in which no candidate received the required majority. He had assumed the title of chief of state and ruled with dictatorial authority. He met with an advisory council, but congress had been dissolved.

Lozano Díaz had encountered little opposition during 1955. Plans were made to elect a constituent assembly which was to choose a president, rewrite the constitution and serve as an interim congress. Early in 1956, however, it became apparent that Lozano Díaz intended to succeed himself. At first, he seemed to have the support of all parties, but the Liberal party headed by Ramón Villeda Morales soon took an independent course. By May, the Nacionalistas had also shown opposition. The two parties finally induced Lozano Díaz to set the date for the election of the constituent assembly for Oct. 7. In June, the Liberals and the Nacionalistas protested that representatives of their parties had been excluded from the all-important electoral boards which would count the votes. They demanded that Lozano Díaz resign. As protests continued during July, Lozano Díaz summarily exiled Villeda Morales, Oscar Flores, editor of the Liberal daily *El Pueblo*, and Francisco Milla Bermúdez, another Liberal leader. The reaction to this was student strikes and general unrest throughout the country, increasing to such volume that they prevented Lozano Díaz from attending the conference of American presidents held in Panamá on July 21 and 22. On Aug. 2 a state of emergency with all the attendant repressions was stamped on Tegucigalpa, following an unsuccessful uprising. In the growing excitement, Lozano Díaz's health failed and he

went to Miami for treatment. However, he came back by the end of September to assume personal charge of the elections. These took place on Oct. 7 as scheduled, and the Lozano Díaz forces promptly announced that they had won all 56 seats in the constituent assembly. This would have assured his being named president, and probably the naming of Abraham Williams Calderón, who had supported him, as vice president. It was widely believed that, once in power, ailing 70-year-old Lozano Díaz would turn over the presidency to Williams Calderón. This was not to be, however, as the whole country considered the elections to be a gigantic fraud. In addition to wholesale threats and intimidations, there had been violence and 11 deaths. The military feared open rebellion if Lozano Díaz attempted to stay in power, and when the three-man junta took over on Oct. 21, there was popular feeling that serious trouble had been averted. Villeda Morales returned from exile on Nov. 12, requesting full support for the junta.

The economic development of Honduras suffered serious setbacks during the political insecurity of 1956. The government curtailed the public works program and one \$12,500,000 project of the United Fruit Co. was postponed. The International Bank for Reconstruction and Development did, however, conclude a \$4,200,000 loan to improve highways. Preliminary studies were begun on the 230-mi. Tegucigalpa-Puerto Cortés highway and also on the 106-mi. San Pedro Sula-El Salvador route. Banana production increased because the industry was recovering from the effects of the winds, floods and strikes of the last few years. Labour disputes of the banana workers were settled in part by arbitration; in some cases, however, the government arrested labour leaders who were advocating strikes.

A survey was under way to study final aspects of the Río Lindo hydroelectric project near Lake Yojoa, and oil concessions were being sought in the departments of Santa Barbara and Olancho. (R. Hn.)

Education.—In the 1953-54 school year there were 2,214 public and private primary schools with 4,007 teachers and 117,292 pupils. Secondary, normal and commercial schools had 884 teachers and 6,847 students. The National university at Tegucigalpa had 843 students. According to the 1950 census, 64.8% of those 10 years of age and over were illiterate.

Finance.—The monetary unit is the lempira, officially valued at 49.5 cents U.S. currency in 1956. Government expenditure (cash transactions) in the fiscal year ending June 30, 1955, totalled 52,900,000 lempiras; revenue, 47,700,000 lempiras. The 1955-56 budget balanced revenue and expenditure at 76,327,358 lempiras; about one-third of the proposed expenditure was allocated to public works under the five-year plan. The internal debt was 11,480,000 lempiras on Oct. 31, 1955; there was no external debt. Currency in circulation (June 30, 1956) totalled 40,580,000 lempiras; demand deposits, 30,380,000 lempiras. The U.S. department of commerce estimated U.S. direct private investments in 1955 at \$101,000,000. The cost-of-living index (Tegucigalpa) stood at 112 in Sept. 1956 (1953=100). National income (gross national product at market prices) was estimated at 588,000,000 lempiras in 1955.

Trade and Communications.—Exports in 1955 totalled 100,700,000 lempiras (adjusted for banana undervaluation); imports were 108,600,000 lempiras. Chief exports were bananas (57%), coffee (12%) and silver (3%). Leading customers were the U.S. (68%), El Salvador (8%), Germany (5%), the Netherlands (4%) and Cuba (3%); leading suppliers, the U.S. (66%), Germany (6%), Netherlands Antilles (5%), Japan (5%) and El Salvador (3%).

Railway mileage totalled 816, confined to the northern banana area. Highway mileage (1952) was 1,124. On Oct. 1, 1954, there were 2,260 automobiles and 3,376 trucks. According to *Lloyd's Register of Shipping*, 117 vessels (100 tons and over) aggregating 431,995 gross tons were registered under the Honduran flag on June 30, 1955. Telephones (Jan. 1, 1955) numbered 7,200, 59.7% of which were automatic.

Production.—Banana exports in 1955 totalled 10,929,000 count bunches (50 lb. each). Coffee production in the 1955-56 crop year was estimated at 287,000 bags of 132 lb. each. Production in the crop year 1954-55 included tobacco 4,200 metric tons; sugar cane 668,900 tons; cotton 1,900 tons. Cattle (Dec. 1954) numbered 1,192,000; pigs (1952) 521,000. Installed electric energy capacity (Dec. 31, 1955) totalled 20,000 kw.; production (public use only) was 62,000,000 kw.hr. in 1955. Gold exports in 1955 were only 855 troy oz. (J. W. Mw.)

ENCYCLOPEDIA BRITANNICA FILMS.—*Caribbean* (1955); *Central America* (1944).

Honduras, British: see BRITISH HONDURAS.

Honey: see SUGAR.

Hong Kong. This British colony on the southeast coast of China consists of Hong Kong Island, the ceded territory of Kowloon, etc., and the New Territories (the rest of Kowloon peninsula and numerous islands, leased from China in 1898 for 99 years). Area: colony 36 sq.mi. (Hong Kong Island 32 sq.mi.); New Territories 355 sq.mi. (incl. Lantau Island 58 sq.mi.). Total pop. (1955 est.) 2,340,000 (including about 13,000 permanently resident British subjects from the United Kingdom and Commonwealth). Language: Chinese (Cantonese); about 5% speak English. Chief towns: Victoria (cap.), pop. (1955), about 1,000,000; Kowloon (1955), about 1,000,000. Governor in 1956, Sir Alexander Grantham.

History.—Relations with mainland China continued friendly during the greater part of 1956, but controversy developed again after the outbreak of riots which began on the Kuomintang national day (Oct. 10), when Nationalist paper flags were removed from walls in Kowloon. In rioting which lasted for two days in Kowloon Nationalists attacked Communist sympathizers and their establishments and foreigners. Military forces had to be called in to assist the police and casualties were estimated at 56 killed and 477 injured. The Peking government lodged a strong protest blaming the authorities for failing to check the disturbances, but their protest was rejected.

In Feb. 1956, quota restrictions on the entry of Chinese into Hong Kong were removed but were reimposed when it was found that about 73,000 or 81% of those who had entered the colony had remained despite the expiration of their permits. The governor, Sir Alexander Grantham, stated that more than 200,000 refugees would have been resettled in fireproof buildings by Sept. 1956, but that 300,000 more had to be rehoused.

Other notable events during 1956 were a report on broadcasting which recommended the creation of a public corporation, stronger transmitters and commercially sponsored programs in both English and Chinese, and the rejection by the government of proposals for building a tunnel under the harbour and a bridge over it in favour of the expansion of the existing ferry services.

Revenue for 1954-55, according to final official figures, was \$434,400,000 and expenditure \$373,300,000 (in Hong Kong dollars). The 1956-57 budget forecast revenue at \$449,800,000 and expenditure \$493,300,000. The colony's total trade in 1955 amounted to \$6,253,000,000, 7% higher than in 1954. Exports to China fell to \$181,500,000.

(W. V. PL.)

Education.—Schools (1955): 1,150, pupils 262,050, teachers 9,445. Teachers' training colleges 3, students 233. University of Hong Kong: students 900, academic staff 130.

Finance and Trade.—Monetary unit, Hong Kong dollar: HK\$5.7=U.S. \$1. Budget (1955 est.): revenue £25,855,000; expenditure £28,065,000. Foreign trade in Hong Kong dollars (1955): imports \$3,718,917,585; exports and re-exports (excluding bunkers) \$2,534,423,746. Main sources of imports 1955: China \$897,646,396; Japan \$525,994,315; U.K. \$441,036,467; U.S. \$324,855,713; Malaya \$151,429,690. Main destinations of exports (1955): Malaya \$375,365,533; U.K. \$251,539,596; Indonesia \$193,388,155; China \$181,560,144; Japan \$146,255,000; U.S. \$87,869,362. Main exports: entrepôt trade, chiefly textiles; also enamelware, plants and seeds for medicines and perfumery; sulphate of ammonia.

ENCYCLOPEDIA BRITANNICA FILMS.—*Hong Kong* (1955).

Honours and Awards: see AMERICAN LIBRARY ASSOCIATION; ANTHROPOLOGY; GEOGRAPHY; LITERARY PRIZES; MINERALOGY; MOTION PICTURES; NOBEL PRIZES; PULITZER PRIZES; RADIO AND TELEVISION; ROMAN CATHOLIC CHURCH; SOCIETIES AND ASSOCIATIONS, U.S.; etc.

Hormones: see ENDOCRINOLOGY.

Horse Racing. Swaps, owned by Rex C. Ellsworth of Columbus, O., was chosen handicap champion of 1956 by the Thoroughbred Racing association. The selections board of the association gave the Pacific coast racer 25 votes, his rivals being Nashua, Summer Tan, Bardstown and Needles. Breaking four world records and tying another, the California-bred colt brought

his earnings to \$848,900 and gained fourth place on the list of the world's all-time money winners. A fractured left hind leg injured in a workout on Oct. 9, forced him out of competition and, although his life was spared, the accident was believed to have ended his racing career. Other champions chosen were Marion du Pont Scott's Shipboard, steeplechase; Calumet farm's Barbizon, two-year-old colts; Freeman Keyes's Romanita, two-year-old fillies; Arthur B. Hancock's Doubledogdare, three-year-old fillies; and the D. and H. stable's Needles, three-year-old colts.

Nashua was retired to stud in October after running his earnings to a new all-time high of \$1,288,565 to surpass the record of \$1,085,760 set by Citation.

Johnny Longden broke the world jockey's mark set by Sir Gordon Richards of England when he won three races at Del Mar, Calif., Sept. 3, bringing his total to 4,871. Richards' lifetime mark was 4,870. Willie Shoemaker became the first jockey in U.S. history to earn \$2,000,000 in purse money in one year. Victory in the sixth race at Garden State on Oct. 18 brought his 1956 winnings to \$2,001,165.

Betting and attendance were both up in most states where racing is legal. New York led the way with an unofficial total of \$381,706,245 bet as against \$355,717,545 waged in 1955. Attendance increased about 2%.

High lights of some of the major races of 1956 follow:

Broward Handicap.—Swaps ran 1 mi. 70 yd. in world record time of 1 min. 39 $\frac{3}{4}$ sec. at Gulfstream.

Californian.—Porterhouse achieved an unexpected victory by a nose over Swaps in \$109,800 event at Hollywood Park. Triumph was worth \$63,700.

Argonaut Handicap.—Swaps won in world record time of 1 min. 33 $\frac{1}{2}$ sec. for mile handicap at Hollywood.

Inglewood Handicap.—Crowd of 50,000 at California track saw Swaps race 1 $\frac{1}{4}$ mi. to universal record of 1 min. 39 sec.

American Handicap.—Swaps flashed to easy victory over Mr. Gus at Hollywood Park to add \$57,000 to earnings.

Hollywood Gold Cup.—Swaps set track mark of 1 min. 58 $\frac{3}{4}$ sec. for 1 $\frac{1}{4}$ mi. in winning \$162,100 test.

Sunset Handicap.—Swaps set world mark of $\frac{1}{2}$ min. 38 $\frac{1}{2}$ sec. for 1 mi. 5 furlongs in winning \$110,500 handicap.

Arch Ward Memorial.—Hasty House farm's Mahan took handicap over grass course as Swaps ran seventh in field of eight.

Washington Park Handicap.—Swaps established track mile mark at 1 min. 33 $\frac{1}{2}$ sec. in defeating Summer Tan in \$142,700 run.

Widener Handicap.—Nashua, making first start in four months, defeated Social Outcast by head in \$129,800 handicap; \$92,600 first money brought his earnings to \$1,038,015.

Gulfstream Park Handicap.—Nashua, carrying 129 lb., met stunning setback, running fifth in field of seven in \$112,900 contest. Brookmeade's Sailor triumphed.

Grey Lag.—Nashua won \$37,100 in handicap at Jamaica, N.Y., with Find second.

Camden (N.J.) Handicap.—Nashua became top money winner of all time on May 19. He took \$22,750 prize to lift total to \$1,100,365. Eddie Arcaro rode victor, who passed Citation's world high of \$1,085,760.

Metropolitan.—Nashua ran fourth as Midafternoon, 9-1, captured 63rd running of handicap at Belmont.

Carter.—Nashua turned in poorest race of career, running seventh in \$58,500 handicap at Belmont. Red Hannigan of Woodley Lane farm, 14-1, was victor.

Suburban.—Belmont's \$55,900 handicap went to Nashua carrying 128 lb. Dedicate (111 lb.) was second.

Monmouth.—Nashua added \$78,200 to earnings at Oceanport (N.J.) track. Runner-up in handicap was Castle Rock farm's Mr. First.

Woodward.—Mr. Gus beat Nashua in \$80,300 stakes at Belmont.

Jockey Club Gold Cup.—Nashua closed racing career on Oct. 13 by setting American record of 3 min. 20 $\frac{1}{2}$ sec. for two miles at Belmont. Winner's purse of \$36,600 brought Nashua's life-time earnings to \$1,288,565. Bold Ruler captured the Futurity, on same program, for purse of \$91,145. Eddie Arcaro rode both victors.

Kentucky Derby.—Needles, owned by Jackson Dudley and Bonnie Heath, finished with rush to beat 16 rivals in 82nd running of the classic at Churchill Downs, Louisville, on May 5. Ridden by Dave Erb, the D. and H. stable colt defeated Calumet farm's Fabius by $\frac{3}{4}$ length. Helen Kellogg's Come on Red was third and Dino Lozzi's Count Chic was fourth. Needles paid \$5.20 for \$2 to win and earned \$123,450 of the gross purse of \$167,550. More than 100,000 persons saw the race at 1 $\frac{1}{4}$ mi.

Preakness.—Fabius won the 80th running of Preakness at Pimlico, Baltimore, Md., May 19, beating Needles by 1 $\frac{1}{4}$ lengths. Willie Hartack rode the Calumet star in the run of 1 $\frac{3}{4}$ mi. Calumet won \$84,250 of the \$132,800 purse. W. E. Britt's No Regrets finished third.

Belmont Stakes.—Needles earned \$33,600 for owners on June 16 with a stirring victory at Belmont Park. Ridden by Dave Erb, the victor came from last to win from C. V. Whitney's Career Boy by a neck, with Fabius 1 $\frac{1}{2}$ lengths back. The 88th running of the stakes, at 1 $\frac{1}{2}$ mi., grossed \$119,650.

Pimlico Special.—Mrs. J. W. Galbreath's Summer Tan, 9-10 favourite, annexed \$50,000 event. Midafternoon was second.

Arlington Handicap.—The Langollen farm's Mr. Gus defeated Summer Tan

by a length, setting U.S. record of 1 min. 54 $\frac{1}{16}$ sec. for 1 $\frac{3}{16}$ -mi. grass course in Chicago. Race grossed \$154,850.

American Derby.—Swoon's Son, owned by E. Gay Drake and ridden by Eddie Arcaro, beat Needles and six others at 1 $\frac{3}{16}$ mi. at Washington Park, Chicago. The Warrior was second, Toby B. third, while Needles ran fifth. Swoon's Son collected \$102,600.

Alabama Stakes.—Tournure from Foxland Hall won one of nation's top races for three-year-old fillies at Saratoga, beating Dotted Line and Levee. Eric Guerin rode 13-1 victor.

Washington Park Futurity.—Willie Hartack rode Greek Game to victory in \$43,510 race. Favoured California Kid, Willie Shoemaker up, finished first but was disqualified for rough riding and given second. The penalty cost California Kid \$87,070 prize.

Atlantic City Handicap.—With an ailing Nashua sidelined, the \$100,000 contest was won by Blue Sparkler, Woodland farm filly.

Wood Memorial.—Crowd of 39,673 at Jamaica, N.Y., saw new racing foul while applied as Golf Ace, after finishing first, was moved down to second and victory given to Head Man and Eddie Arcaro. The interference cost Golf Ace \$42,400 purse.

Leonard Richards Stakes.—Christiana's Ricci Tavi, 22-1, surprised with 1 $\frac{1}{2}$ -length triumph over favoured Fabius at Delaware.

Coaching Club American Oaks.—Longest race in America for three-year-old fillies, test of mile and three furlongs was taken by Levee. Princess Turia was second, Lady Swords third in photo finish at Belmont.

Delaware Handicap.—World's richest race for fillies and mares, carrying gross value of \$156,500, was won by Flower Bowl, 16 to 1 shot from the brookmeade stable.

Arlington Classic.—Swoon's Son drove to 1 $\frac{1}{2}$ -length triumph over Ben A. Jones in \$158,825 mile test to earn \$102,000.

Garden State Stakes.—Calumet's Barbizon, with Willie Hartack up, won world's richest race at Camden, N.J., on Oct. 27. Beating Federal Hill by a nose, Barbizon gained \$168,565 from purse of \$319,210. Amarullah finished third in field of 19.

Santa Anita Derby.—Terrang, stablemate of Swaps, 1955 victor, defeated Social Climber, with More Glory third in \$158,800 race at Arcadia (Calif.) track.

San Juan Capistrano Handicap.—Bobby Brocato took \$115,000 handicap. New Castle.—Calumet's Miz Clementine won from 11 rivals at Delaware park.

Campbell.—Bowie (Md.) handicap, grossing \$110,750, was won by Sailor with Joe Jones second. Sailor injured ankle in muddy going and was forced out of racing for more than six months.

Gardenia Stakes.—\$136,275 race at Garden State Park, world's richest for two-year-old fillies, went to Magic Forest, who won \$93,550 for C. V. Whitney. Romanita finished first but was disqualified and moved down to third. Light'n' Lovely was given second.

Florida Derby.—Needles, with Dave Erb up, led 13 rivals at Gulfstream to earn \$95,200 of \$145,400 purse. Count Chic was second.

Flamingo Stakes.—Needles and jockey Dave Erb won \$111,600 of \$148,000 purse at Hialeah. Golf Ace ran second.

Santa Anita Handicap.—Bobby Brocato won \$135,000 race by six lengths.

Santa Anita Maturity.—Trackmaster defeated Traffic Judge by head in \$55,960 event for four-year-olds.

Washington (D.C.) International.—Master Boing, French colt owned by André Lombard, beat Mr. Gus by five lengths in 1 $\frac{1}{2}$ -mi. turf course test. Laurel, Md. Victor earned \$70,000 of \$100,000 purse.

United Nations Handicap.—Career Boy won the \$100,000 handicap at Atlantic City, N.J. Find was second, Mr. Gus third.

Delaware Oaks.—Dotted Line, 10-1, captured winner's share (\$40,325) neck from Levee.

Kent.—Happy Hill farm's Kingmaker beat favoured Head Man at Delaware.

Westerner.—\$87,250 test at Hollywood Park taken by Count of Honor.

Arlington Futurity.—Greek Game defeated Colonel Jet by five lengths in \$40,850 contest in mud at Chicago.

Hawthorne Gold Cup Handicap.—Dedicate, owned by Jan Burke and ridden by Bill Boland, won \$80,750, beating Summer Tan in photo finish. Find was next in \$129,850 run.

International Steeplechase.—Lawrence Troiano's King Commander, 1-10-2 favorite, won 59th running of jumping classic at Belmont by seven lengths.

Harbor Hill Steeplechase.—Frank D. Adams set modern record when he scored his 300th triumph over the jumps at Belmont on Sept. 13. Adams aboard Ancestor.

Michigan Mile.—Nonnie Jo set track mark of 1 min. 36 $\frac{1}{16}$ sec. in winning \$58,450 test at Detroit. James Paddock, owner, sold half share of his horse to P. L. Grissom as field of 11 was going postward.

Harness Racing.—Adios Harry, property of J. Howard Lyons

Greenwood, Del., was top money winner of 1956 with \$129,912.

United States Trotting association champion of 1956 won 18

30 starts, including the \$75,000 Eastern title pace at Yonkers

(N.Y.) raceway. Dottie's Pick, owned by C. E. and J. E. Arm-

strong of Brampton, Ont., was runner-up with \$101,142 in purses.

ae Intruder scored one of the year's major surprises by winning

the \$100,604 Hambletonian trotting stake at Good Time Park,

Orhshen, N.Y., on Aug. 8. The winner, owned by L. J. Buck of

Or Hills, N.J., and driven by his trainer, Ned Bower, earned

\$9,155. The Intruder finished 11th in the first heat, won by

Valiant Rodney, and then took two straight. Valiant Rodney was

confd and Nimble Colby third in the final standing.

Add Hanover won the Yonkers Futurity and a purse of \$38,199,

and Noble Adios took the William H. Cane Futurity Pace and a



KENTUCKY DERBY field of 17 horses breaking from the starting gate at the May 5, 1956, running at Churchill Downs, Ky.

\$35,427 prize at Yonkers. Belle Acton, champion filly of 1955, added \$34,320 to her earnings by winning the Messenger Stake at Westbury, L.I. Another major race, that for the \$52,666 Little Brown Jug at Delaware, O., was won by Noble Adios. Nimble Colby took the \$53,731 Kentucky Futurity.

Devotees of harness racing were more numerous and bet more in 1956 than in any previous year. With major tracks at Yonkers and Westbury, New York state headed the list with unofficial figures of \$325,420,967 bet by 10,069,959 customers. Wagering rose more than \$42,000,000 over 1955, while attendance broke the old record of 9,852,991 set in 1953. (T. V. H.)

Canada.—At the second session of the 22nd parliament in 1955, legislation was enacted to provide for the person or association conducting a race meeting to deduct from the total amount wagered a levy of 0.5%. This levy is payable to the receiver general of Canada for the purpose of financing by the federal government an adequate and uniform system of supervision at all race tracks. As a consequence, in addition to providing supervision staff to each racing association, as was done in the past, the federal department of agriculture (the department charged with race track supervision) further arranged to provide a photo finish camera service as a greater protection for the betting public.

Before the start of the 1956 racing season, the Ontario provincial government announced a reduction of 1% in the Ontario race track tax. This reduced the total percentage deducted from the total monies wagered in that province to 15 $\frac{1}{2}$ %, made up of 9% to the racing association (which percentage is governed by section 178 (4) of the criminal code), 6% to the provincial government, and the 0.5% supervision levy. The pari-mutuel tax collected by each provincial government is a set percentage

fixed by act and varies from 5% to 10% depending on the province concerned. (J. D. HN.)

Great Britain.—In the 1955-56 National Hunt season Limber Hill won the King George VI steeplechase at Kempton park before going on to win the Gold cup at Cheltenham. Doorknocker became the new champion hurdler. The Grand National steeplechase would go down in racing history not for its winner, the not undeserving E.S.B., but for the cruel stroke of luck that deprived Queen Elizabeth the queen mother's Devon Loch of certain victory: ten lengths clear and only 50 yd. from the winning post, the horse unaccountably slipped and came down spreadeagled.

The 1956 flat racing season was disastrous for the number of important races lost to French (£96,000 in stakes) and Italian (nearly £24,000) owners. For England, Gilles de Retz won the Two Thousand Guineas and Honeylight the One Thousand Guineas. But Lavandin of France won an undistinguished Derby from his compatriot Montayal and from Roistar of Ireland; three French fillies (Sicarelle, Janiari, Yasmin) filled the places in the Oaks. The Ascot Gold cup went to the French horse Macip. Later the St. Leger went to the Frenchman Cambremer.

The richest prize of English racing, the King George VI and Queen Elizabeth stakes at Ascot, was won by the unbeaten Italian four-year-old Ribot. In October Ribot won Europe's richest race, the Prix de l'Arc de Triomphe at Longchamp, Paris. The greatest horse in Europe since World War II and among the greatest of the century, Ribot had won all his 16 races. Sired by Tenerani out of Romanella and bred at the Dormello stud near Lake Como, Italy. Ribot was reckoned to be worth upward of £500,000 to his owners, Donna Lydia Tesio and the Marchese Incisa della Rochetta.

Zarathustra, French Beige and Donald were top-class stayers. Hugh Lupus, somewhat luckless as a three-year-old, had a fine season, taking the March stakes, Hardwicke stakes, Scarborough stakes and Champion stakes. Matador was a brilliant sprinter. Talgo improved steadily through the season and won the Irish Derby and finished second in the Prix de l'Arc de Triomphe.

(R. M. GN.)

Horses: see LIVESTOCK.

Horse Shows: see SHOWS.

Horticulture. Storms of almost unprecedented violence swept over much of Europe early in 1956, causing damage which was reported as catastrophic. Six inches of snow fell overnight in Rome, It., the temperature fell well below zero in France and the government lifted all import restrictions on potatoes and other vegetables, and Germany had the worst winter since 1879. The loss in trees, shrubs, flowering plants and especially vineyards in these and neighbouring countries was too great to be estimated. The perfume flower trade, which usually shipped hundreds of thousands of blooms each year, was at a standstill. Bulb growers in the Netherlands sent 1,000,000 gladiolus corms (bulbs) to nurserymen and florists of southern France, following the disastrous storms, to help them resume business. Later the Netherlands itself suffered loss estimated at about \$52,000,000 because of spring and early summer floods.

The National Rose society in England, with 43,000 members, observed its 80th anniversary and celebrated the occasion by presenting 300 rose trees to Queen Elizabeth II. George Taylor of the British Museum was appointed director of the Royal Botanic Gardens at Kew, succeeding Sir Edward Salisbury. The Netherlands government sent 10,000 trees and shrubs to the states of Massachusetts, Connecticut, Pennsylvania and Rhode Island to replace those lost in the great flood of 1955. Twenty-five countries were represented at the convention of the International Seed Testing association in Paris in June. W. A.



SHOTGUN POLLINATION of a hybrid apple which cannot fertilize itself was tried by Washington state apple growers in the spring of 1956 to overcome the time-consuming process of hand pollination

Davidson of the U.S. was elected president, and Norway was selected for the next convention, to be held in 1959.

The first large flower show in Moscow, U.S.S.R., since World War II was held in April and May 1956. There were reliable reports that the Soviet Union was developing a very large area in Siberia for horticultural purposes, particularly for the cultivation of fruits and vegetables. The Russians began a ten-year experiment with copper wires stretched across fields to direct cosmic rays into the soil. The purpose was to determine if the growth and ripening of fruits and vegetables could be hastened in this way.

The fruit companies in Nova Scotia announced that the British government had allocated £1,250,000 for the purchase of North American apples. This was of great assistance to Canadian growers. Great flocks of starlings, originally imported into the U.S. to eat caterpillars, continued to push their way into western Canada, causing heavy losses to fruit growers as well as to general farmers. It was announced at the National Shade Tree conference in Toronto, Ont., Aug. 20, 1956, that a system of fungicide injections through holes bored in trees having the Dutch elm disease would be available commercially by 1958. Until this fungicide, no means of checking this fast-spreading disease had been found. Thousands of infected trees had been destroyed in eastern parts of the U.S.

The gladiolus industry in Florida was found to be the largest flower-producing group in the U.S., with reported \$8,000,000 annual gross receipts and 10,000 ac. under cultivation. The Orchid Growers association of America was formed in Santa Barbara, Calif., in April with Arthur F. Freed of Malibu, Calif., as president. The second world orchid conference was held in Honolulu, T.H., Sept. 19-23, 1956. A \$1,000,000 wholesale flower

market was opened in San Francisco, Calif., in July. Announcement was made that the International Flower show in New York would be resumed March 31–April 6, 1957, on a large scale in the huge new Coliseum. Emphasis would be laid on exhibits from foreign countries.

Florists throughout the U.S. were forced to recognize a growing trend toward omitting flowers at funerals. If continued, it would cause a serious financial blow to florists. Supermarkets were appearing as a new medium for the sale of garden supplies. Approximately 2,500 buyers were reported as attending a four-day garden supply show at the Coliseum in New York.

John H. Walker of the staff of the National Geographic society in Washington, D.C., was appointed to the office of secretary of the Society of American Florists at the 72nd annual meeting in St. Paul, Minn., in July 1956. The George Robert White medal of honour was awarded by the Massachusetts Horticulture society to Harold L. Lyon of Honolulu, who was given credit for much of the horticultural development of that island. Two new roses, White Bouquet, a floribunda, and a climber, Golden Showers, were announced as the All-America rose selections for 1957. The rapid introduction of climbing roses capable of producing flowers throughout the season created a new appeal to amateur gardeners.

The cranberry crop in the U.S. was smaller in 1956 than in recent years, but the use of mechanical pickers was much more general. Birds and Japanese beetles threatened the rapidly growing cultivated blueberry industry in New England.

Although wet weather late in the summer of 1956 delayed the digging and curing of bulbs in the Netherlands, it improved the quality of the bulbs and there was a satisfactory yield. However, bad weather caused shipments of paper white narcissi from France and Italy to be very short. European-grown tuberous begonias were losing out in some degree to the superior stock grown in California. The Netherlands, however, was sending some particularly good regal lilies to the U.S.

(See also BACTERIOLOGY; FRUIT; VEGETABLES.) (E. I. F.)

Hospitalization Insurance: see HOSPITALS; INSURANCE.

Hospitals. Hospitals in the United States during 1955 and 1956 followed the general pattern of recent years toward constant expansion of services, with the goal of improved patient care. These expanding services included the trend for the general hospital to care for patients in such specialized areas as psychiatry and tuberculosis which were formerly treated only at special hospitals; development of home care programs and out-patient services; advances in physical therapy and rehabilitation services; and increased use of new medical diagnostic and therapeutic aids such as radioactive isotopes.

More and more patients were being admitted to hospitals, the number of hospitals and hospital beds was rising, more babies were being born in hospitals, and the total number of hospital personnel had risen sharply. In 1955 there were more than 21,000,000 hospital admissions in the United States, and, in addition, more than 73,000,000 out-patient visits were reported. There were 9.8 hospital beds per 1,000 population.

Utilization and Finances.—In 1956 the American Hospital Association completed its first decade of reporting basic data on the hospitals of the United States. These statistics for the years from 1946 to 1955 offered further evidence of the tremendous expansion in hospital services which was still under way.

By 1955 the total assets of the nation's hospitals amounted to nearly \$12,000,000,000. With the growth in hospital services and the increased use of hospitals by the public, there was a corresponding increase in the nation's expenditure for hospital care.

Table I.—Hospital Plant and Utilization, 1946-55

Item	1946	1955	Per cent increase
Hospitals reporting	6,125	6,956	14
Hospital beds	1,435,778	1,604,408	12
Admissions during year	15,674,602	21,072,521	34
Average number of patients in hospitals each day	1,141,864	1,363,024	19
Births	2,135,327	3,476,753	63
Total hospital personnel	829,571	1,300,733	57
Average number of personnel for each 100 patients	73	95	22

Table II.—Hospital Expenditures, 1946-55

Item	1946	1955	Per cent increase
Total hospital expenses during year	\$1,963,355,000	\$5,594,304,000	185
Total payroll expenses during year	1,102,772,000	3,581,784,000	225
Average total expense per patient per day	5.21	11.24	116
Average payroll expense per patient per day	2.93	7.20	146

The averages shown in the tables conceal great variation among hospitals of different types. Seventy-five per cent of all hospitals in 1955 were short-term nonfederal hospitals providing general and special services, and these hospitals accounted for nearly 91% of all admissions. The average length of stay in these hospitals was 7.8 days. On the other hand, while only 8% of all hospitals were devoted exclusively to psychiatric service, more than half of all patients being cared for in hospitals each day were in psychiatric institutions, which offered predominantly long-term care.

Of the nearly \$6,000,000,000 expended by the nation's hospitals in 1955, 61% was expended by the short-term nonfederal hospitals, 17% by nonfederal psychiatric hospitals, 15% by federal hospitals and the remainder by nonfederal long-term hospitals.

Personnel.—The average number of personnel per patient was highest in the group of short-term hospitals operated by non-profit organizations, with 210 employees for every 100 patients, and was lowest in the nonfederal psychiatric hospitals, which averaged 28 employees for every 100 patients. These two groups of hospitals also were at the extremes in cost per patient day. In the short-term nonprofit hospitals the average cost of each day of patient care was \$24.15, of which \$14.76 was for payroll; while the average daily cost per patient in the nonfederal psychiatric hospitals was \$3.73, of which \$2.17 was for payroll.

Although the total number of personnel employed in hospitals rose 57% from 1946 to 1955 (see Table I), the increase failed to keep pace with the expansion of hospital facilities and the increasing number of patients. In short-term general hospitals in 1955 there were approximately 50 more hospital employees per 100 patients than there were ten years before, yet more were still needed in every area. There had been a marked trend toward reduction of working hours and an increase in salary rates in the hospital field to levels more nearly comparable with those in other fields. Training programs for highly skilled technical personnel had also grown, but not in proportion to the demand.

Hill-Burton Program.—The year 1956 marked the tenth anniversary of the Hospital Survey and Construction act of 1946 (the Hill-Burton program). This act and its subsequent amendments authorized federal grants to states to pay part of the cost of constructing public and other nonprofit hospitals and related health facilities. By June 30, 1956, more than 3,000 medical and hospital construction projects had been approved under the Hill-Burton act, and two-thirds had been completed and were in operation. Total estimated cost of all the projects was \$2,467,333,207, of which the federal share was \$781,421,267. These included more than 550 new general hospitals built in communities where a hospital never before had been located, and more than 600 new public health centres.

Another important objective of the Hill-Burton program was the development of more adequate training programs for medical and hospital personnel. Funds were granted for the construction of teaching hospitals in university medical centres in 20

states and for aid to more than 200 hospitals approved for training interns and residents in various medical specialties.

Accreditation.—During 1955 the Joint Commission on Accreditation of Hospitals surveyed, at the request of the hospitals themselves, 1,204 hospitals in the United States, bringing the total of accredited hospitals in the United States to 3,259.

Hospital Insurance.—During 1955 the number of persons in the United States with some type of hospital expense protection reached 108,000,000, an increase of 7,000,000 over 1954. The 86 hospital-sponsored nonprofit Blue Cross plans in 1955 observed the 25th anniversary of the inauguration of prepaid hospital care in the U.S., and in 1956 passed their 50,000,000 point in membership. (See also INSURANCE.)

The American Hospital association, as part of its program of services to hospitals, sponsors National Hospital week, which in 1956 was on the theme of the hospital's role as a community centre in disaster planning and the provision of emergency services. (E. L. CY.)

Great Britain.—The cost of the hospital service in Great Britain for 1955-56 was originally estimated at £345,500,000, but a supplementary estimate submitted in Feb. 1956 provided for a total net expenditure of £354,600,000. The cost for 1956-57 was estimated at £373,200,000. The minister of health announced a further expansion of the hospital building program. New building projects would cost £18,000,000 in 1957 and £20,000,000 in 1958-59, as compared with £13,000,000 in 1956.

The report of the committee of inquiry into the cost of the national health service was published in Feb. 1956. Evidence which had been submitted did not support allegations of widespread extravagance in the national health service, including the hospital service, whether in respect of the spending of money or the use of manpower.

The ministry of health instituted during the year a national scheme for the postentry training and further education of hospital administrative and clerical staffs, for improved standards of recruitment for junior staffs and for special selective training. The Hospital Administrative Staff college of King Edward's Hospital Fund for London and the University of Manchester agreed to participate in the scheme. Sixteen trainees were selected and began their training in the autumn.

(See also NURSING; RED CROSS.)

(A. G. L. I.)

Hotels, U.S. Gross sales of hotels in the United States for 1955 were approximately \$2,653,000,000, an increase of nearly 3% over 1954, according to the American Hotel association, which represents 6,000 of the leading hotels in the U.S. Gross income for 1954 was \$2,575,802,000. Sales were divided as follows: room sales, 47.6%; meals, 33.7%; beverages, 12.6%; telephone, 3.5%; and other income, 2.6%.

Hotel room occupancy for 1955 held at 73%, which was the same as 1954. The gain in dollar volume was accounted for by a 3% rise in hotel and dining room and restaurant receipts, and by some increases in room rates.

Construction of new hotels was at a higher rate during 1955 than in the previous year, with 83 built or under construction, representing 17,500 additional guest rooms valued at an estimated \$186,000,000. Approximately 20,000 more guest rooms were added to existing buildings. In 1954, 54 new hotels, valued at \$146,000,000 and representing approximately 10,097 new guest rooms, were built or started in the U.S.

In 1955, nearly \$210,000,000 worth of business was accounted for by Universal Travelcards, the hotel credit card approved by the American Hotel association and recognized by hotels throughout North America for charging of rooms, food and other services, as well as for cashing checks. This was a substantial increase over 1954, when approximately \$165,000,000 worth of credit

was extended to holders of Universal Travelcards.

Universal Travelcards are issued by the American Hotel Credit corporation, Greenwich, Conn., which guarantees American Hotel association member hotels against losses arising from nonpayment of bills or bad checks. Altogether, hotels reported and recovered \$206,115 in 1955 on delinquent accounts and for bad checks, of which \$24,000 was paid to hotels by the American Hotel Credit corporation on hard-to-collect accounts. Of this amount, approximately \$11,000 was written off as uncollectable, leaving \$13,000 as claims receivable.

To provide the hotel industry with more factual information and data on an endless variety of new products and materials used by hotels in the normal course of operation, an expanded program of scientific research and product testing was undertaken by the American Hotel association in 1955. At the same time, minimum product performance requirements and standards were developed by the association to aid member hotels in the purchase of equipment and materials.

A survey by the American Hotel association indicated that U.S. hotels had spent nearly \$3,000,000,000 in the last five years on modernization and renovation. New hotel facilities for motorists included adjoining parking lots, lighted, paved and fenced; adjoining or underground garages, including many with direct entrances to the hotel; and special motor entrances, provided in some cases with separate registration desks and direct elevator service to guest-rooms floors. Among the special arrangements for family groups were "family units" designed to accommodate as many as four members of a family in beds, cots or cribs; baby-sitting services; special dining facilities for family groups with children; and nurseries equipped with toys and cribs.

According to the 1955-56 edition of the *Hotel Red Book* there were more than 15,582 hotels in the U.S., with a value in excess of \$6,000,000,000 (land, buildings, furniture, fixtures). Their 1,440,000 rooms could accommodate more than 2,000,000 guests each night. During the calendar year 1955, the nation's hotels were host to more than 260,000,000 room guests.

Founded in 1910, and official spokesman for the hotel industry, the American Hotel association is a federation of 80 state and regional associations in the United States, Canada, Mexico, Bermuda, Hawaii, Alaska, Puerto Rico and the Virgin Islands. Its membership in 1956 was comprised of approximately 6,000 leading hotels representing about 75% of the nation's hotel rooms. (C. A. HH.)

Housing. In 1954-55, there was much concern in the United States about the excess of new housing units over net household formation and the inflationary implications of a high volume of new construction. In 1955-56, residential builders and others were greatly disturbed by the decline in home building. In 1954-55, the rate of new construction was 1,300,000 units a year, and in 1955-56 it was 1,100,000 units. Although this was a shift of only 15%, the fluctuations in the volume of residential construction had been so violent in the past that a consistent movement in either direction that persisted for any length of time was considered to have the real possibility of soaring out of sight or plummeting to zero. Because of its great potential volatility, every attempt was made to keep the volume of residential construction from dropping below 1,100,000 units or rising much over 1,400,000 units per year.

In 1956, the government was faced with the necessity for supporting a sagging market. In a period of 18 months, the annual rate of private nonfarm dwelling units placed under construction dropped from 1,458,000 to 1,070,000 and gave every indication of continuing downward. The contraction in the volume of new construction was largely attributed to the growing shortage of mortgage money and to rising interest rates. But the softening

of consumer demands, although of lesser importance, was a significant contributing factor, and one that was largely overlooked or minimized in the analysis of the housing market.

The Mortgage Money Crisis.—As early as the fall of 1955, mortgage money problems had attracted governmental attention to such an extent that the senate banking and currency committee organized and conducted a round-table discussion on the importance of federal credit policies on residential construction and mortgage financing, in which leading government officials and specialists in the field participated. Although the problems were clearly stated at that time and the trends identified, no governmental action was taken until the summer of 1956, and funds available for home financing continued to become more scarce.

The dearth of mortgage money was not due to conspiracy on the part of lending institutions, but rather to the hard objective developments in the general money market. Although residential construction had slowed down, other types of building activity continued at an unprecedented rate, and the demand for money to finance new plants and equipment rose to an all-time high. Total expenditures for new private domestic investment of all types during the first quarter of 1955 was at an annual rate of \$54,700,000,000. By the second quarter of 1956, it had reached \$64,200,000,000, an increase of 17%. During the same period, expenditures for new plants and equipment rose by 43%. This enormous additional pressure on the money supply occurred in a period in which savings remained virtually constant, and the demand for money rapidly outstripped the available supply. Under such circumstances the cost of money, *i.e.*, the interest rate, inevitably rose. In an attempt to curtail an inflationary expansion of credit, the Federal Reserve board repeatedly increased the rediscount rate, which served to drive the interest rate even higher, a development consistent with the tight money policy of the administration. As the rate rose, the Federal Housing Administration (FHA) and the Veterans administration (VA) mortgages with interest rates fixed at 4½% became less and less attractive to financial institutions which could obtain a minimum of 5% on alternative types of investments.

The government-insured or government-guaranteed home loans with their low down payment requirement and long terms had been a highly significant means of broadening the market and placing homes within the reach of most U.S. families. During the first six months of 1956, as a result of developments in the mortgage market, the number of new dwelling units financed by FHA and VA mortgages declined 31% and 28% respectively from the levels of a comparable period of the previous year.

In addition to the contraction in demand for housing resulting from higher interest rates, the shortage of mortgage funds also reduced the supply of new dwellings by fostering a more cautious and restrained attitude on the part of builders.

Administrative Action.—In late Sept. 1956, the government took several steps to ease the mortgage market. The Federal National Mortgage association, an agency that purchases home loans from private lending institutes which then use the money to make new loans, reduced the amount of stock that lenders were required to purchase in the agency from 2% to 1%. "Fannie Mae," as the association is known, was authorized to issue commitments in advance to buy mortgages on housing projects not yet begun at a price of six points under par instead of the previous discount of eight points. The advance commitment guaranteed the mortgage holder a market for his loan after the home was built, and the smaller the discount the more valuable the commitment. In another action, the Home Loan Bank board, through which savings and loan associations can expand their credit facilities, increased the amount that member associations could borrow from 10% to 12% of their assets.

To help the home buyer and the builder of small homes, the



MODEL RELAXING in the living room of an entirely plastic house exhibited at the Paris, Fr., domestic fair of 1956. All furnishings and construction are plastic. Bookshelves (as shown), beds, sinks and closets are moulded from the same plastic sheets used for walls and floors

FHA reduced its down payment requirement on insured mortgages from 7% to 5% on homes selling for \$9,000 or less. For higher-priced homes, the required down payment was unchanged.

Many observers maintained that the government's actions would have only a minimal effect on the market. They pointed out that few savings and loan associations had borrowed up to the previous 10% limit of the Home Loan Bank board. In addition, they found that only 16% of the new homes financed with FHA mortgages sold for \$9,000 or less, and in some high-cost areas like New York and Chicago virtually no new homes were available in that price range. Government officials, however, were reluctant to administer stronger measures because of general inflationary tendencies in the economy, and the desire to reserve such actions for periods when it would become necessary to stimulate investment and employment.

The Housing Act of 1956.—The Housing act of 1956 was an omnibus bill whose many provisions amended existing legislation to facilitate its operation, and with one major exception—housing for older persons—contained little that was new. It was in line with the administration's policy of conservatism in this field and satisfied neither the militant advocates of extended governmental construction activity nor those who sought greater aid to private industry.

Public housing, as usual, caused the greatest difficulty. In the previous year, congress had authorized 45,000 units and virtually all of these were put into some stage of construction. In each of the next two years the new law provided for only 35,000 units, a reduction in public housing at the same time that it appeared that the number of new private units would also decline. The senate had passed its own bill calling for 135,000 units in one year, but the house of representatives forced a compromise at 70,000 units for two years, which was accepted in order to obtain any housing legislation at all.

The act also liberalized the loans eligible for FHA insurance for financing home improvement and repair, construction of rental housing and the purchase of single-family homes. The maximum amount of improvement loans eligible for insurance was raised from \$2,500 to \$3,500 in single-family homes and \$10,000 to \$15,000 on apartment buildings. In addition, the repayment period was extended from three years to five years.

Multifamily rental housing, which had declined to negligible levels in the FHA program in recent years, was given a boost in the new act. Permissible loan-to-value ratio for section 207 units was raised from 80% to 90% and the loan limits were also increased. For co-operative housing, loan commitments could be issued for developments to be sold to a co-operative group after completion of construction, which meant that actual construction could get under way before all the future co-operators had become members. The loan-to-value ratio was increased and the \$8,900 limit per dwelling unit on mortgages could be raised by \$1,000 per room in areas where building costs were high. The act also equalized the mortgage terms of old and new housing. Thus, loans on existing structures could cover 95% of the \$9,000 of value and 75% of the balance.

Existing urban renewal legislation was strengthened in many ways including authorization for the payment of moving expenses of families displaced by renewal projects. Families would be compensated up to \$100 and business establishments up to \$2,000, entirely out of federal funds.

The only innovational feature of the act of 1956 was the provision made for housing of elderly persons. It was the first time that legislation had considered the needs of a specific age group. Persons who had passed their 60th birthday could secure an FHA-insured mortgage for the purchase of a home with a third person or corporation making the down payment. Nonprofit groups such as churches, labour unions or fraternal organizations were eligible to secure insured mortgages to build rental housing for older families. These loans might provide up to 90% of cost and as much as \$8,100 per dwelling unit. The projects might include special construction features such as central dining halls, reading rooms and safety equipment in the bathroom and elsewhere. The development might be elevator apartments, garden-type structures, row houses or separate dwellings if they were grouped in a contiguous project.

The Ladies Had Their Day.—Early in the spring, Albert M. Cole, administrator of the Housing and Home Finance agency, called a conference to which 100 housewives from all over the country were invited to Washington, D.C., to express their views on the features that they desired in a home. The women felt that space was the most important single item and insisted that 1,200 sq.ft. should be the minimum size of a dwelling. They also wanted at least one-and-a-half, but preferably two bathrooms; three bedrooms so that the children would not have to double up; and a family room for television, games and childrens' activities. Sufficient space in the kitchen was desired for breakfast and between-meal snacks, but a full-scale dining room large enough to accommodate the family and guests was needed for more formal meals. The women also wanted a separate utility and laundry room on the ground floor next to the kitchen. And of course they expressed the need for more closets and other storage space.

There was considerable objection to some of the postwar architectural clichés, including picture windows that had no view, excessive emphasis on gadgets and the lack of variety in tract houses. The women also felt strongly about the unnecessary removal of large shade trees and about unrelieved rectangular street patterns.

Governmental studies of the characteristics of new construction indicated that the house-building industry had been provid-

ing only a portion of what the consumer desired. In part, on account of current levels of building costs, it was economically impossible to include all of the desired features and still keep the selling price in lower ranges. In part it was due to the builders' propensity to include "selling features" that might attract customers, but that had little enduring functional value. More than two-thirds of the homes in the \$10,000-\$15,000 price range had less than 1,200 sq.ft. of space, and the majority had less than three bedrooms. Only one-third had utility rooms and these were usually designed to accommodate little more than the furnace and water heater.

The Average G.I. Home Purchaser.—Since the end of World War II, millions of veterans had been aided in the purchase of homes by the G.I. Bill of Rights. The bill provided for guarantee of mortgage loans, offered low interest rates, long periods of repayment and required little or no down payment on the purchase price. In 1954 and 1955 alone, 1,050,000 purchasers availed themselves of the benefits offered under this program.

There had been much speculation on the characteristics of the G.I. home buyer. Should he prove to be more susceptible to economic reverses, or more likely to overextend his credit position, the government might find itself responsible for all or a major portion of his mortgage debt.

In order to obtain the facts of the case, the Veterans administration, the federal agency in charge of the program, studied both the purchaser and the purchase. As in the case of most studies of this sort, they found that the typical purchaser was a statistical fiction. The ages of purchasers ranged from 20 to 72 and their incomes fell anywhere between \$1,800 and \$90,000 a year. The average, but by no means typical, purchaser of either a new or existing house was 32 years of age, earned \$494 per month and purchased a home that cost \$11,800. His monthly housing expenses, which included mortgage payments, taxes, insurance, maintenance and repairs, totalled \$97 or about 20% of his income. The average veteran purchaser was quite solvent, considering his age, possessing close to \$1,900 in liquid assets such as cash, savings accounts, stocks and bonds.

Regarding the terms of purchase, the VA found that 40% of the acquisitions in 1955 were made without down payment, and nearly one-half had mortgages with maturities of 26 to 30 years. Veterans who borrowed 100% of the purchase price tended to have incomes that were 8% lower than those who made down payments. Those who made down payments, however, did not strip themselves, retaining liquid reserves equivalent to about 10% of the price paid for the home. (CH. RA.)

Canada.—Expenditures on new residential housing during the first half of 1956 amounted to \$712,000,000, an increase of 12% over the corresponding period of 1955. Of this increase about one-third resulted from higher prices; the rest represented a greater volume of work in process. Expenditures on privately initiated housing accounted for almost all of the increase.

The volume of house-building activity was higher during the first seven months of 1956, despite a decline in mortgage lending for this purpose. Although starts of new dwelling units were virtually at the same level as in 1955, the number of dwellings completed was greater and there were also more units under construction. While the annual rate of housing starts had been declining moderately since the third quarter of 1955, the decline in National Housing act lending in 1956 had not yet made its full effect on housing starts by mid-1956.

Lending under the N.H.A. continued to decline in the second quarter of 1956, and the number of units for which loans were approved during the first six months was 19% lower than during the same period in 1955.

Throughout the period, Canada's economy continued to expand

at a high rate, and the banks were under heavy pressure to increase their loans to business and other clients. In the spring of 1956 they faced additional seasonal demands for business credit and some of the banks began to cut back on their mortgage loans to builders. In the second quarter of the year, bank mortgage lending was down much more than that of life insurance companies, whereas the reverse had been true in the first quarter. The volume of bank mortgage lending under the act during the second quarter was 37% below the same 1955 period. Also contributing to the decline in mortgage lending under the act was the fact that builders in some localities faced difficulties in providing land for residential housing. These developments resulted in a drop of 6,000 units in the total number of dwellings for which loans were approved under N.H.A. during the first half of 1956.

The combined index of residential building materials and wage rates of construction workers in 1956 stood at 136.6 in July as compared with 135.8 on April 1. The increase was reflected in the higher cost of dwellings financed under the act. Average estimated construction costs for all single-family dwellings went up from \$9.72 per square foot in the second quarter of 1955 to \$10.08 per square foot in the second quarter of 1956. Over the same period, the average floor area for this type of dwelling increased from 1,106 sq.ft. to 1,132 sq.ft. The cost of lots also continued to rise. The average price of lots for all single-family dwellings under the act increased from \$1,197 in the second quarter of 1955 to \$2,004 in the corresponding period of 1956. (C. Cy.)

Great Britain.—During 1956 the single factor which most influenced housing in Great Britain was the economic situation of the country as a whole. In spite of this, in the 12 months ended June 30, 1956, 273,519 houses were built, 146,539 of these being erected by local authorities, 117,284 by private builders and the remainder by housing associations and government departments. During the first two full quarters of 1956, private builders slightly increased the number of completions compared with 1955, and had more houses under construction at the end of the period than at any time since World War II. The number of completions by local authorities tended to fall slightly. Private builders, who were beginning to get into their stride after being freed from licensing, did not appear to be noticeably affected by the high interest rates or credit restrictions. Many local authorities made efforts to get approvals for new building through before Nov. 1955, when the subsidies were reduced, so that no very marked decrease in their output was yet apparent. Slum clearance work was the only field in which there was a decided increase in activity. More than half as many houses as were dealt with in the whole of 1955 were covered by figures for the second quarter of 1956, which showed 11,641 houses in clearance areas submitted, 1,802 in clearance orders confirmed and 6,273 in compulsory purchase orders confirmed. The number of persons moved from houses demolished or closed was 20,892 during the first quarter of 1956 as against 75,918 during the whole of 1955.

The Housing Subsidies act, 1956, became law in March 1956. By this act rates of subsidy were reduced from £22 1s. for normal housing to £10 for 60 years. Moreover, the minister of housing, Duncan Sandys, was given power to reduce or cease paying this subsidy, although he was expected to continue it only for a term of two years. The act fixed a subsidy of £22 1s. a year for 60 years for dwellings provided by a local authority for the purposes of slum clearance and redevelopment, or for the rehousing of persons coming from camps or other unsatisfactory temporary accommodation. A subsidy of £24 a year for 60 years was fixed for houses provided in the course of a scheme of town development under the Town Development act, 1952, or

for persons coming from outside an area to meet the urgent needs of industry. It also applied to houses provided by the local authority of a congested or overpopulated area as part of a comprehensive development in some other area and houses provided by a development corporation.

Europe.—Throughout most European countries, house production was maintained at a comparatively high level. The municipality of Vienna was able to invite delegates to the 23rd International Congress on Housing and Town Planning to witness the handing over to the tenants of the 100,000th dwelling built by the municipality. A survey of the European housing situation, prepared by the Economic Commission for Europe and published by the United Nations in Jan. 1956 showed that broadly, taking dwellings per 1,000 inhabitants as a measure of quantity, western and central Europe were the best provided, with 270 dwellings per 1,000 persons. Southern Europe followed with 224 per 1,000, and eastern Europe, including the whole of the U.S.S.R., had 219 per 1,000. The U.K. at the latest census available, compared favourably with most other European countries in the percentage of dwellings possessing electricity, inside running water and baths. The percentage of obsolescent dwellings in the older industrial countries, however, was high, and after France with about 40% of all dwellings around 100 years old, the U.K. with more than 20%, together with Austria, Portugal and Spain, had the oldest housing stock. (See also ARCHITECTURE; BANKING; BUILDING AND CONSTRUCTION INDUSTRY; BUSINESS REVIEW; FARMERS HOME ADMINISTRATION; MUNICIPAL GOVERNMENT; TOWN AND REGIONAL PLANNING.) (M. C. SN.)

ENCYCLOPEDIA BRITANNICA FILMS.—*The Baltimore Plan* (1953); *Building America's Houses* (1947); *How to Improve Your House* (1945); *The Living City* (1953).

Human Rights, Covenant of: see INTERNATIONAL LAW.

Humour of 1956. Television performances of the situation comedy or rapid-fire gag varieties continued in 1956 to provide history's biggest forum for the display of that brand of humour thought of as typically United States. The following are some examples:

GARRY MOORE (CBS-TV)

(Participating: Garry Moore, Denise Lor and Durward Kirby)

MOORE: For some time now, we've been interested in a campaign to liven up our daily conversation by substituting new words for the old commonplace ones we've got tired of.

After all, things get pretty dull after you say them a couple thousand times . . . as regular watchers of this show can testify. However, new words would change all this. Take the old nursery rhyme, "Mary Had a Little Lamb." You know it, don't you, Durward?

KIRBY: Sure. (Recites coyly)

Mary had a little lamb,
Its fleece was white as snow;
And everywhere that Mary went,
The lamb was sure to go.

MOORE: Isn't he a doll? There's something of the Liberace in him. Anyway, with new words, "Mary Had a Little Lamb" becomes new and interesting all over again, like this:

Mary had a blicken oof,
It's prooze was white as werf;
And glutendot that Mary gleat,
The oof was sure to gerf.

Isn't that fascinating?

We were going to have entertainment today, but we decided to do this instead. Anyway, we got to wondering what some of our television shows would sound like if they were done with new words. For instance, we might have Warren Hull in "Strike It Rozbort" . . . or Ralph Edwards in "This Is Your Grammenfloof" . . . then on Saturday nights you could hear "Your Snork Parade," starring Giselle McGlozbar and Snooky Goofnik. And when you want to find out what kind of a day it's been, you tune in on John K. M. McSnidlit and the 11 o'clock swen.

Yuh know, you're sitting there looking at me as if I were a darn fool . . . but you're understanding every word I'm saying . . . and to prove it, suppose we do a television show with new words and show you how they improve things. The one we've selected to do is an old favourite of ours. . . . "Dragnet."

BAND: ("Dragnet" theme)

MOORE: This is the flanagan . . . A teeming bortisneed of 10,000,000



snidbits. My job is to keep law and grifts. I'm a Floop.

BAND: ("Dragnet" theme)

MOORE: My name is Sergeant Fozmerlude . . . I'm a Floop. The orken you are about to hear is plut. It was taken from the files of the Berken-daddie. Only the girls have been changed to protect the zabgan. It all began on Friday, April the zneep . . . zup p.m. I was in the grammenfloog oiling my dootenforzer. A report came in from headquarters that a woman with two mozniks had been jidnicked and glagened by a man carrying a .38-calibre dootenforzer . . . model M-1. It was the fourth jidnicking in three days . . . My job, to find this glagener . . . I'm a Floop!

BAND: (Theme and suspense)

MOORE: My name is Sergeant Fozmerlude, ma'am . . . I'm a Floop, ma'am . . . I'd like you to tell me all you can about the jidnicking.

DENISE: There's not much to tell. I was jidnicked and glagened, that's all. Happened last night. Man walked in carrying a .38-calibre dootenforzer . . .

MOORE: Did he say anything?

DENISE: Not much. Just said, "Okay, lady, stick 'em up . . . this is a jidnick." He wore a mask so I knew he was a glagener. Do you think you can find him, Sergeant . . . Sergeant . . .

MOORE: Sergeant Fozmerlude, ma'am.

DENISE: Fozmerlude?

MOORE: That's right, ma'am . . . Sergeant Fozmerlude . . . I'm a Floop. Tell us exactly what happened.

DENISE: I was upstairs with my two little mozniks. It was their bed time. I was reading them a story about Little Red Stootniggin and the Three Snorks . . .

MOORE: Go on.

DENISE: Suddenly the doorbell rang.

MOORE: The doorbell?

DENISE: Yeah, you know . . . the nafienshpiel. It was this man with the .38-calibre dootenforzer.

MOORE: After he told you it was a jidnick, did he glagen anything?

DENISE: A little Mama-Shlumpie that belonged to my oldest moznik.

MOORE: Her Mama-Shlumpie?

DENISE: Yeah. Gave it to her for Christmas. Pretty little Mama-Shlumpie. Nice one, too . . . looked just like her, too.

MOORE: Looked just like who, ma'am?

DENISE: You know, that movie actress, Pozbo. Her picture's playing downtown now.

MOORE: The Mama-Shlumpie looked like Ava Pozbo?

DENISE: That's right. Just like Ava Pozbo. Funny a big man should glagen a Mama-Shlumpie from my little moznik. Why should he do a thing like that, Sergeant . . . Sergeant . . .

MOORE: Friday, ma'am. Is that all you can tell us?

DENISE: That's all. Except for one thing.

MOORE: One thing?

DENISE: I pushed him down the stairs.

MOORE: Ma'am?

DENISE: I pushed him down the stairs.

MOORE: Was he hurt?

DENISE: Fractured his yokniddle.

BAND: ("Dragnet" theme)

MOORE: We were looking for a man with a fractured yokniddle and a Mama-Shlumpie. A man answering this description was seen on Sixth avenue, lingering near the subway blinken. A further check showed that he had gone into a movie theatre . . . the feature picture . . . Ava Pozbo in *Bhowani Masbortle*. . . We found him in the balcony with his fractured yokniddle in a sling and the Mama-Shlumpie in the seat beside him.

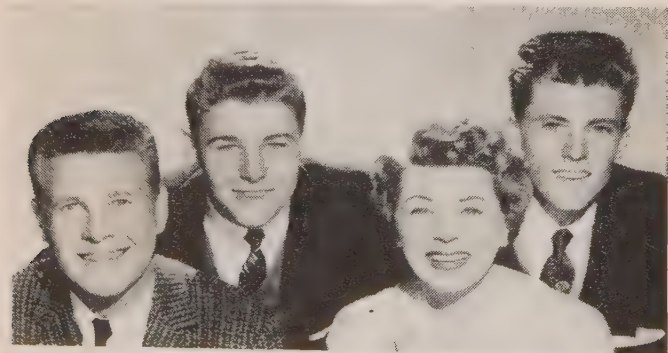
BAND: ("Dragnet" opening)

MOORE: As a result of tonight's orken, the prisoner was found mentally gemixed. He was sent to the State Home for Chronic Poopniddles.

BAND: (Theme and payoff)

OSZIE AND HARRIET (ABC-TV)

(The scene is in the Nelson bedroom. Harriet is at her dressing table. She is just putting on the finishing touches and looks beautiful. David comes in. He is all dressed except for his coat, which is on his arm.)



DAVID: Gee you look beautiful, Mom. Everybody'll think you're my sister for sure.

HARRIET: Thank you, dear. Do you really mean that or are you practicing up for Cathy's mother?

DAVID: Oh, are you kidding, Mom? I don't think I'd have the nerve to say anything like that to a girl's mother.

HARRIET: Oh, and don't worry about tonight.

DAVID: Oh, I'm not. I'm sure everybody'll have a good time.

HARRIET: No, I mean about your father and Ricky and me. As soon as we meet all your friends we'll get right out of the way and let you have your own party just as you want it.

DAVID: Well, gee, you don't have to rush right off. After all it is *your* house.

HARRIET: It's *our* house and it's *your* party—say, I hate to rush you dear, but hadn't you better get going pretty soon?

DAVID: Yeah, I was just looking for my plaid vest. Have you seen it around any place?

HARRIET: It was in your closet this afternoon. I saw it.

DAVID: So did I, but it isn't there now. I wonder what happened to it (Ozzie comes in wearing David's plaid vest)

OZZIE: Has anybody seen my brown cashmere coat?

DAVID: Oh, yeah, I have it right here. I was wondering if I could borrow it for tonight.

OZZIE: Oh, yeah, sure . . .

DAVID: (Hesitates) Gee . . .

OZZIE: Is something the matter?

DAVID: I was kinda figuring on wearing my plaid vest with it.

OZZIE: Oh, sure. Here you are, Dave. (Takes vest off and hands it to him)

DAVID: Gee, I hate to do this.

OZZIE: Oh, don't be silly, I'll wear my gray suit. It's a little more conservative anyway.

DAVID: Well, I've gotta go and pick up my date. I hope her mother likes me.

OZZIE: Well, remember what I said, Dave. Just tell her how young she looks and you're all set.

DAVID: (Laughs) I'm afraid I haven't got the nerve, Pop. I'll see you later.

OZZIE: Goodnight.

HARRIET: Goodnight, Dave.

(David exits)

OZZIE: I hope my gray suit is pressed.

HARRIET: Now remember, dear.

BOTH TOGETHER: This is David's party.

HARRIET: And I want you to promise me you won't try to organize a bunch of games and start tackling practice in the living room.

OZZIE: Hey, that's right. There'll be quite a few football players here tonight, won't there?

HARRIET: Yes, and they get all the practice they need on the field.

OZZIE: For goodness sakes, Harriet, I'm not gonna play football in the living room.

HARRIET: And no card tricks.

OZZIE: Please, I may be corny, but I'm not *that* corny.

(David comes to doorway)

DAVID: Hey, Pop. Did you want these for something?

OZZIE: What's that?

DAVID: This deck of cards. They were in my vest pocket.

(Scene: Nelson living room. Ozzie looks out bay window)

OZZIE: (Calls upstairs) Harriet!

HARRIET: What do you want?

OZZIE: Come down, will you, the crowd is starting to arrive.

(A little later, Ricky is halfway down the stairs, struggling with his drums. They are stuck)

RICKY: Hey, Pop. Help me with these drums, will you?

OZZIE: Ricky, you know what David said. Now take those drums back upstairs.

RICKY: That's what I'm trying to do. I'm stuck.

(Ozzie starts up to help him. The doorbell rings)

OZZIE: (Calls) Just a second. (To Ricky as he frees it) Careful now! Don't scratch up the banister.

(He rushes downstairs and opens the door. It is Don and a girl and two other couples)

OZZIE: Oh hello, Don, come on in.

DON: H'ya, Mr. Nelson. I don't know if you know everybody or not

OZZIE: Well, they all look familiar. (They exchange greetings) How's your kid brother with the measles?

DON: Oh, he's coming along fine, thanks.

(Some more couples arrive)

OZZIE: Come on in, fellahs and girls. I'm Dave's father. (They exchange greetings) Don't give me the grip by mistake, fellahs, I'm not a Kappa Sig

(Don sees Ricky struggling with the drums)

DON: H'ya, Rick. Are we gonna have some music tonight?

RICKY: I don't know. I was just gonna take the drums upstairs.

DON: Are you kidding? Come on, let's get 'em down here. I'll give you a hand.

NANCY: Do you have a record player?

RICKY: Yeah, it's right in the den.

NANCY: Oh, good, maybe we can have some dancing.

(More couples have come in the front door, including Dave and Cathy)

DAVID: Pop, I want you to meet Cathy Williams. This is my father (They exchange greetings) Where's Mom?

OZZIE: Here she is. (As Harriet comes down the stairs.)

(Harriet and Cathy exchange greetings. More couples come in the front door. Shortly afterward, three couples come in through dining room. One of the guys is Chuck)

CHUCK: We came in the back way. I hope it's okay.

(Harriet moves toward them)

HARRIET: Sure it is.

CHUCK: How have you been, Mrs. Nelson?

HARRIET: Fine, thanks, Chuck.

CHUCK: Do you know everybody?

HARRIET: I think so. But don't ask me to call off their names.

(She takes their coats)

CHUCK: I hope you don't mind. I couldn't help but notice a lot of food as I came through the kitchen. Does that mean we're going to eat tonight?

OZZIE: It sure does.

(David steps up)

DAVID: I thought you guys said you just wanted Cokes and potato chips

CHUCK: Not me, I'm on a diet. I can't eat potato chips. Do you have any hamburgers?

DAVID: About 50 pounds of them.

GIRL: I'll help you cook them, Mrs. Nelson. I'm really a good cook.

CHUBBY: Stop bragging.

(Scene: In the Nelson den. Ricky has his drums set up and is looking over the records)

RICKY: What kind of a tempo do you like?

NANCY: Anything smooth and dreamy. (She picks one up) How's this one? "Cuban Fantasy."

RICKY: That's real good.

(The music starts. It is a Latin tempo. Ricky picks up the bongo drum and plays with the record)

(Scene: Living room. In this and following scene some of cast have Cokes. Ozzie is standing there with several football players. They all have their coats off)

OZZIE: In my opinion, the basic principles of defensive end play are the same now as they were 25 years ago. You get across that line of scrimmage, get those hands in front of you. Then you've gotta determine whether you're gonna turn the play in or float out with it.

DON: Tell Bob about the point of weakness, Mr. Nelson. (Bob is a big strong guy)

OZZIE: Well . . . no matter how strong a position you take you can be pushed off balance with two fingers at your point of weakness.

DON: Take a strong position, Bob.

BOB: (Does) How's this?

OZZIE: That's good. (Demonstrates) Now look, your two feet are your positives. If I draw a line perpendicular to *that* line, that is your point of weakness and I can push you off balance with my two fingers. (He does) (Meanwhile, we hear music from the den)

BOB: How about that? I knew my geometry would come in handy one of these days.

(Nancy enters)

NANCY: Hey, come on in the den, everybody. Ricky and Betty are doing a terrific dance.

(Scene: Den. A crowd is standing around encouraging Ricky and his partner, who are doing a fast-tempo dance. They finish to much applause)

(Scene: Nelson bedroom. Several girls are standing with Harriet admiring the curtains)

GIRL: I think these curtains are just beautiful.

HARRIET: Thank you.

GIRL: They match the curtains on your dressing table, don't they?

HARRIET: Yes, they do.

(David comes to the door)

DAVID: Hey, Mom, I hate to interrupt this, but some of the guys were wondering when we were gonna eat.

HARRIET: Okay. Put on the coffee, Dave, and I'll be right down.

(Scene: Den. Couples are dancing. It is a medium-tempo fox trot. Ozzie is dancing with Cathy)

OZZIE: It was very thoughtful of you to ask me to dance with you, Cathy.

CATHY: Oh, I'm enjoying it. You know, it's so hard for me to think of you as being David's father. You look young enough to be his brother.

OZZIE: (Laughs) Oh, thank you very much. It's probably this bow tie I'm wearing.

(Scene: Backyard. A group of boys and girls are playing basketball. Others playing badminton. Others are watching. All are having fun)

(Scene: Nelson kitchen. Harriet is cooking hamburgers. Eager boys are surrounding her, lending helping hands)

(Scene: Nelson living room. Some kids are playing pin the tail on the donkey. One boy is blindfolded but when a pretty girl sashays by, he follows her. Harriet appears in dining room and rings a dinner bell)

HARRIET: Come and get it.

(They do)

(Scene: Nelson hall. The party is breaking up)

GIRL: It was a wonderful party.

DAVID: Gee, Mom, Pop, I don't know how to thank you. Everybody said this was the best party the Kappa Sigs ever had.

HARRIET: I'm glad they had a good time, dear.

DAVID: Gee, you and Pop sure made a big hit with everybody. Even Ricky was less obnoxious than usual.

RICKY: I thought I was quite charming, myself.

HARRIET: (To Ricky) You were wonderful, dear.

OZZIE: They're a nice bunch of kids and that Cathy is just about the cutest girl you've ever been out with, Dave.

HARRIET: She sure is.

DAVID: I'm glad you like her.

OZZIE: Don't keep her out too late now.

DAVID: Oh, I don't have to worry about that. Her mother seemed to take a liking to me right away.

HARRIET: Oh, that's nice.

OZZIE: Goodnight, son. (They shake hands and David goes out the front door)

(Scene: Boys' bedroom. Ricky is dressing for a date. David is sitting on the bed)

RICKY: Now let me get this straight. As I meet her mother, I say, "This can't be your mother. It *must* be your sister."

DAVID: That's right, and believe me, it works like a charm.

(Scene: Ricky is on Betty's front porch practising)

RICKY: (To himself) You can't be Betty's mother, you don't look a day over 30.

(He is satisfied so he confidently rings the bell. Betty answers the door)

BETTY: Come on in, Ricky. I'll get my coat.

RICKY: Thanks.

(As Betty goes to get her coat, Ricky sees a young woman reading a magazine)

RICKY: I'm Ricky Nelson.

WOMAN: Hello, Ricky.

RICKY: This is impossible.

WOMAN: Is something the matter?

RICKY: You look so young. You look more like Betty's sister than her mother. You can't possibly be more than 30 or 31.

WOMAN: I am Betty's sister. I'm 23 years old, and if you don't bring her home by 11 o'clock I'll phone the police.

(Fade)



SID CAESAR ("People to People" from "Caesar's Hour," NBC-TV, written by Sid Caesar, Mel Tolkin, Larry Gelbart, Mel Brooks, Sheldon Keller; © 1956 by Shellric Corp.)

CARL: Ladies and gentlemen, we have just visited Dr. John Wilkins . . . the noted scientist and author . . . and now "People to People" takes you to the apartment of the noted jazz musician and recording artist . . . Mr. Cool Cees. Mr. Cees is considered the world's greatest exponent of rock and roll jazz. He lives in this modest apartment in midtown Manhattan.

(Sid in chair; he turns around, and we see his glasses for the first time)

CARL: Good evening, Mr. Cool Cees.

SID: Good evening, Daddy.

CARL: Do you mind if I call you Cool?

SID: Is that my name?

CARL: Yes.

SID: Then go ahead, man, call me that name.

CARL: That's certainly a nice apartment you have there, Cool.

SID: Yeah, man, like it's home . . . or somewhere.

CARL: Would you care to show us around the room?

SID: Yeah, man . . . like that would be solid. (He gets up) This is a wall. (Other side) And this is the other wall. And these other two match. It's a set.

CARL: I notice there's a hole in the middle of the floor. What is that for?

SID: Oh, man, that's the latest. You see I had this hole put in the room . . . so now the whole room can be played as a record. It's in a new album, called "Rooms to Spin By."

CARL: I notice you've got quite an art collection . . .

SID: Yeah, man, I dig painting.

CARL: But all the pictures seem to be upside down.

SID: No, man, them pictures ain't upside down. I'm just standing this way for the show. When you leave . . . I revert! Say, man, maybe you'd like to pick up on this?

CARL: What's that, Cool?

SID: My baby pictures.

CARL: By the way, when were you born?

SID: I was born 1927 . . . on Feb. 38.

CARL: And where were you born?

SID: In Birdland. My mother was playing bongos with Herbie Hi Fi.

CARL: May we get a closeup of that baby picture, Cool?

SID: Yeah, sure, Pops. (Shot of Sid as baby with hair and glasses, lying on rug) . . . This was when I was a little baby making the Pablum scene.

You notice the bearskin rug . . . I had it made into this jacket.

CARL: Would you play any of your records for us, Cool?

SID: I like I'd admire to, Pop. Let's segue to the joy box and we'll lay some sound on you. (And he holds up a record) . . . Here it is, my latest release on the Prescription label. Now dig this, man. . . This is a wild sound . . . (Spins record. No sound. Sid snaps fingers to music) . . . Do you like it?

CARL: I can't hear it.

SID: Nobody can hear it. But do you like it?

CARL: Is that some special sort of hi-fi?

SID: Oh, this is the highest they've ever fied. If they fi any higher than this, they'll foo.

CARL: Cool . . . The world is becoming increasingly jazz conscious. I understand you yourself have just come back from a world-wide tour of jazz concerts.

SID: Well, I didn't actually go around the world. I just stood a foot off the ground for a while, and watched it roll under me. (Carl laughs)

CARL: Well, tell me, Cool, what was your impression of Europe?

SID: Well, man . . . Europe's okay . . . but Asia swings!

CARL: Cool . . . what advice do you have to young musicians?

SID: Well, I would advise them to eat a solid breakfast, then klezmurize . . . then eat a healthy lunch, then klezmurize, then you eat a great dinner, then klezmurize.

CARL: Excuse me, Mr. Cees. . . What does the word klezmurize mean?

SID: What do you care? You're eating, ain't you?

CARL: Cool, I hope we won't be imposing on you too much if we ask you to play something for us. I'm sure our audience is very anxious to hear you play.

SID: Well, I'd be progressively honoured to wail for the cats watching in. . . Please, step into the music room. (They go into the music room, where a band is set up)

CARL: Is that your orchestra, Cool?

SID: Yes, I got tired of changing the records so I just brought the boys down here.

CARL: How many in your orchestra?

SID: How many is 16?

CARL: Sixteen.

SID: That's it. Okay, one, two. . . (Into music)

ERNIE KOVACS ("Welcome Transients," NBC-TV)

(Setting: Simple living room; two chairs set at 45° to each other; small table in between. Pete Hanley should have plain, dark clothing, hair wet down flat, parted in middle, rimless glasses)

BILL: The television programs that have interviews with out-of-town guests are particularly interesting when the guest has a sincere and personal experience to talk about. . . . And here is Ernie Kovacs as the M.C. in television's moving daytime interview show, "Welcome Transients."

KOVACS: We knew that the listeners of "Welcome Transients" would be interested in the fascinating and exciting story that Mr. Albert Gridley has to tell. . . . Mr. Gridley's story is one he will never forget. . . .

PETE: Yes, it is etched into my mind forever. . . . It is as if it happened yesterday. . . .

KOVACS: Tell us your story, Mr. Gridley.

PETE: Well, I was one of . . . (Pause)

KOVACS: One of five children.

PETE: Yes, one of five children who went out . . . (Pause)

KOVACS: West. . . . With your father and mother.

PETE: With my father and mother. We were out in the middle of the desert. I'll never forget what happened that day. . . . It was on the . . . (Pause)

KOVACS: Fifth day.

PETE: Fifth day after we left . . . (Pause)

KOVACS: And wasn't the sun beating down?

PETE: Yes, the sun was beating down and it was hot.

KOVACS: And did your 1918 Ford have motor trouble?

PETE: Yes, our 1918 Ford had motor trouble. It was . . . (Pause)

KOVACS: Terrible.

PETE: Terrible. I'll never forget what Dad said. Dad said . . . (Pause)

KOVACS: Did he tell you to go to the nearest town to get a new fan belt?

PETE: Yes, he told me to go to the nearest town to get a new fan belt. My four sisters . . . (Pause)

KOVACS: They were: Alice, Mabel, Myrtle and Bessie?

PETE: Yes, Alice, Mabel, Myrtle and Bessie.

KOVACS: Bessie.

PETE: Yes, Bessie.

KOVACS: What did your sisters do?

PETE: They . . .

KOVACS: Did they stay behind in the car while you went in for the fan belt?

PETE: They stayed behind in the car while I went in for the fan belt.

KOVACS: And what happened while you were in town getting the fan belt? . . . What happened to Myrtle?

PETE: Myrtle?

KOVACS: Your sister.

PETE: Oh yes, Myrtle my sister. . . . I'll never forget it. . . . A wolf . . . (Pause)

KOVACS: Did a rattlesnake bite your sister Myrtle?

PETE: Yes, a rattlesnake bit my sister Myrtle . . . on the arm?

KOVACS: Leg.

PETE: Yes, on the leg. I'll never forget it. . . . It was terrible.

KOVACS: And then your father killed the snake and when you came back from town with the fan belt you fixed the car, and you drove off to settle in California and everything went well after that. . . .

PETE: Yes. . . . Like you said.

KOVACS: Thank you for coming on "Welcome Transients," Mr. Gridley. . . . You had a wonderful and exciting story to tell . . . one that lived with you every moment.

PETE: Yes, I'll never forget it. . . . It is etched in my memory.

**GEORGE GOBEL** (NBC-TV)

There's been a rash of elopements breaking out lately. I read of one family where the butler eloped with the maid, the gardener eloped with the cook and the dish ran away with the spoon. That's how Alice and I got married; we eloped. It was a carefully planned elopement. She planned it. I didn't even know about it. See, what happened was we were out on a date one night, and we were sitting around a dark little soda fountain and the soda jerk said, "Do you like chocolate malteds?" And Alice said, "I do." Then he said to me, "Do you like chocolate malteds?" And I said, "I do." And the soda jerk said, "You may now kiss the bride." Now that

I look back on it, I shoulda figured there was something kinky when we walked into that drugstore and the pharmacist was singing "O Promise Me." But I'm not sorry it happened, because Alice and I have been happily married for 14 years now. Well, Alice has been happily married for 14 years. I figure if I get six or seven happy years out of it, I'm ahead of the game. See, I go along with the great philosopher Plato, who said—and I quote: "Marriage is like a hanging. It leaves you blue in the face and you break your glasses."

SAM LEVENSON (CBS-TV: © 1957, by Sam Levenson)

Papa's second cousin owed him \$50. He couldn't pay, so he gave Pop his car. Mama threw a fit: "What are we going to do with a car?" "Foolish question," said Pop.

The old gent got a learner's permit, and his son Harry, who didn't have a licence, took him out for instruction.

Pop came back from his first lesson white as a ghost. Mom said: "Don't tell me! I know. You killed somebody." Mom began to faint. Pop went right into his address to the jury: "That blind horse! I am going like this, he is coming like that. . . . So I make like this. . . . He makes like that. . . . So what are you looking at me for? All right. The car's in the garage. A

couple of scratches." Pop secretly borrowed \$50 from the cousin who owed him money and had the car repaired.

The night before his road test, Pop was delicious. He drove Mom out of bed four times and kept braking the bed post till it actually broke.

The inspector gave Pop his licence out of deference for his age and determination. This is what happened.

When Papa saw the inspector who was going to give him his road test his mind went blank. "Well," said the inspector. "Let's get going." And Papa said, "I forgot how to open the door."

When Papa got into the car he had more knee action than the car.

"Okay, first back up," said the inspector.

That was one thing Papa could do perfectly. He backed up slowly, quietly, right onto the sidewalk, flush against the side of a building.

The inspector told Papa to keep calm and go forward. Papa calmly shifted into reverse again and stepped on the gas. The motor raced like mad, but the building wouldn't budge.

By this time there were at least 100 people watching him. Two guys were selling balloons, and four kids got lost.

Papa put the car into reverse, stepped on the gas, but the car still wouldn't move. Papa finally wiped his brow meekly and apologized to the inspector: "I'm sorry. I must be out of gas!"

**Humphrey, George Magoffin**

(1890—), U.S. government official.

was born on March 8 at Cheboygan, Mich., and received his law degree from the University of Michigan, Ann Arbor, in 1912. Until 1918 he practised law in Saginaw, Mich., and in that year he was appointed general counsel of the M. A. Hanna company, steel and coal manufacturers, at Cleveland, O. In 1925 he was named vice-president and in 1929 president of the company, which he expanded into a large and profitable industrial enterprise. He became chairman of the board in May 1952. During the administration of Pres. Harry S. Truman, Humphrey accepted two quasi-federal posts—chairman of the U.S. department of commerce's business advisory council in 1946, and head of a survey of German industrial plants conducted by the Economic Cooperation administration in 1948-49.

Humphrey was selected by Dwight D. Eisenhower to be U.S. secretary of the treasury in the administration that took office in Jan. 1953. He shortly thereafter let it be known that the administration's fiscal policy would be to balance the national budget before cutting taxes; he blamed the mounting federal debt on the preceding Democratic administrations. On Aug. 27, 1953, however, he declared that the "turning point" had been reached on the road toward balanced budgets.

In 1955 Humphrey successfully opposed a Democratic move to grant flat tax reductions of \$20 to each U.S. income taxpayer and dependent. His name was mentioned sporadically in 1956 as a possible running mate for President Eisenhower, but he disclaimed any intention of seeking the Republican vice-presidential nomination.

Hungary.

A people's republic of southeastern Europe, Hungary is bounded west by Austria, north by Czechoslovakia, east by Rumania and south by Yugoslavia. Area: 35,905 sq.mi. Pop.: (1949 census) 9,204,799; (1955 est.) 9,861,000. Languages (1949 census): Hungarian 98.7%; German 0.2%; Slovak 0.3%; others 0.6%. Religion (1949 est.): Roman Catholic 70.6%; Calvinist 22.8%; Lutheran 3.3%; Orthodox 0.4%; Jewish 1.9%. Chief towns (pop., 1949 census; 1954 est. in parentheses): Budapest (cap.) 1,612,287 (1,781,085); Szeged 87,878 (88,590); Debrecen 112,955 (113,248); Miskolc 109,301 (135,780). First secretaries of the Hungarian Workers' (Communist) party (renamed on Nov. 1 Hungarian Socialist Workers' party) in 1956: Matyas Rakosi, Erno Gero (from July 18), Janos Kadar (from Oct. 25). Chairman of the presidential council of the national assembly, Istvan Dobi. Chairman of the council of ministers in 1956: Andras Hegedus, Imre Nagy (from Oct. 24) and Janos Kadar (from Nov. 4).

History.—At the end of 1955 two tendencies had characterized the situation in Hungary. On the one hand, a policy of liberalization was pursued within the Communist party, or through its agency, despite resolutions adopted denouncing Imre Nagy and his group; on the other, the Warsaw treaty was strengthened. The controlled press made it obvious that a very relative liberalization was contemplated as the price of Hungary's closer association with the Warsaw collective security system. The real character of the system became clearer by references in the press and over the radio to "British colonialism," and by the support given to the pan-Arabic tendencies of Gamal Abdel Nasser in an extreme version unknown perhaps even in Egypt. On Oct. 24, 1955, Hungary had established "closer relations" with Egypt, and this step was hailed in the controlled press as a sign of the firmer siding of the people's democracies against imperialism." The political consultative committee of the signatories of the Warsaw treaty met in Prague on Jan. 27-28, 1956, and sent out instructions on this policy to the Communist parties of each country concerned.

On Feb. 21 the rehabilitation of Bela Kun was announced. For years his name had been suppressed in the school textbooks, which otherwise praised the "proletarian dictatorship" of 1919 as a glorious event. For the first time it was said that Matyas (Roth) Rakosi, Gyorgy Lukacs and other representatives of Moscow who had played a part in Hungary since 1945 had been in their youth collaborators of Bela Kun, now presented as a victim of Stalinism.

Further denunciation of Stalinism came in March, when Laszlo Rajk, hanged in 1949, was solemnly rehabilitated; he was subsequently reburied in the presence of the government. Hungarians seemed, however, hostile to all forms of communism. This was almost openly stated by many who had the opportunity to approach foreign observers on this occasion. On May 18 Rakosi made a speech admitting "mistakes" committed in the recent past and announcing the imminent release of several "left" Socialists, collaborators of his party in the early phase of the regime. A universal refusal to comply with party instructions and the failure of the regime to carry out its aims any longer became clearer from week to week. In June the party press published many apologies to Marshal Tito, during his visit to Moscow, and also published denunciations of the past. Although the leading note in all this was the contrast between the good Marxist-Leninist communism and the Stalinist "cult of personality," little remained of anything that people had ever associated with communism. The collectivization of agriculture was condemned in theory as well as in practice; the low quality of industrial production was denounced; and the absence of any artistic value in Soviet propaganda plays, shows and books was admitted. The argument that communism was nevertheless a great forward step in history sounded less and less convincing.

Such was the position in the middle of the year when the Poznan events occurred in Poland. The Hungarian workers' solidarity with the Poznan rising took the form of spontaneous manifestations, while the police, the party organizations and trade-union officials who tried to prevent them were ignored in the factories. On July 1 the party central committee once more denounced and this time expelled Imre Nagy "for openly taking stand against the party," but on July 18, Rakosi resigned and at this time, going beyond the generalities of May 18, accused himself personally, while enumerating "past faults." On July 22 Mihaly (Wolf) Farkas, former minister of defense and for some time Rakosi's close associate, was expelled from the party, but Ernő (Singer) Gero, more hated even than Rakosi by most Hungarians, took over the general secretariat of the party and declared: "A Hungarian Poznan must and will be avoided."

The crisis was prolonged throughout August, with increasing,

although minor anticommunist manifestations. These included open discussions at the Petofi circle, the writers' and journalists' association, which refused to elect the communist list of candidates, electing instead notable anticommunists, such as the writer Lajos Kassak, recently released from prison, to its presidium. Gero stayed in Belgrade in September and met Tito again during the latter's trip to the U.S.S.R. at the end of that month. No disclosure of undoubted authenticity had been made by the end of 1956 concerning the aim of this trip.

On Oct. 23, the students of Budapest university demonstrated in the gardens of the National museum. They demanded the return of full national independence. The movement spread spontaneously and rapidly. The Soviet command was at first completely disconcerted and reacted only on Oct. 25, the day on which Gero's resignation was announced. Soviet emblems throughout Budapest were removed, Stalin's statue was destroyed, the army joined the popular movement and the civilian police opened the Austrian frontier and shot members of the previously dreaded secret police, the A.V.O. (Allam Vedelmi Osztaly, or state security department).

By Oct. 28 the country was almost completely liberated. Imre Nagy, who had been restored to membership in the party on Oct. 13, became prime minister on Oct. 24; he promised the withdrawal of Soviet troops, first for Jan. 1, 1957, but, by the next day, "immediately," Anna Kethly, former Socialist deputy released from prison, and Zoltan Tildy, head of the state in 1946-48, were said to have joined the government. In reality no government functioned fully and the membership of the government was changed three times within a week. The name of Bela Kovacs, former Smallholder deputy, was published in each of the lists of ministers but in fact reliable reports state that he did not join any government, refusing to collaborate with the communists. The attempt to return to the coalition basis of 1945 (Peasants, Socialists and Communists) did not succeed despite the fact that the names of members of these parties appeared in the lists of ministers. The total rejection of communism by the insurgents became increasingly obvious. By Oct. 31 Gen. Pal Maleter and Gen. Bela Kiraly seemed to be in control of Budapest and the western half of the country. The situation was less clear in the east, where Soviet troops were more numerous. Fighting, intense between Oct. 25 and Oct. 30 and costing about 10,000 lives, died down between Oct. 30 and Nov. 4. Joseph Cardinal Mindszenty, liberated from prison, made a triumphal entry into Budapest on Oct. 31. Hungarian delegations were sent to Vienna to explain events and ask for immediate food relief. On Nov. 1 Imre Nagy declared Hungary to be neutral and urged immediate recognition of this status by the United Nations.

Although fighting had ceased, new Soviet units were moved into Hungary. Negotiations began, on the Soviet request, concerning "modalities of withdrawal." On Nov. 4 the negotiators were arrested. Imre Nagy withdrew to the Yugoslav embassy, from where, in circumstances not yet explained, he was recaptured on Nov. 23 and deported to Rumania. Janos Kadar, Nagy's minister of the interior, was nominated acting prime minister by the Soviet command on Nov. 4. He promised withdrawal of Soviet troops as soon as "normal life and production" were restored. Cardinal Mindszenty took refuge in the U.S. legation, foreign correspondents and delegates in other diplomatic premises.

The food situation became alarming in November. Relief reached the western towns Sopron, Szombathely and Gyor but seldom went farther east. This fact partly explained the movement westward of a great number of persons from all over the country; in many cases they crossed the Austrian frontier. By Nov. 30 about 100,000 refugees had reached Austria.

Severe fighting occurred after the Soviet counterattack of Nov. 4 at Dunapentele, Tata, Dorog and Gyor, costing thousands



Above: Rebel fighter, age 10



Above: Blasted façade of the Hungarian radio station in Budapest

THE HUNGARIAN REBELLION, 1956

Below: Captured Soviet tank in Budapest. Rebel forces used captured equipment to supplement their own meagre ordnance in the fight



Below: A Budapest mother lighting candles around the flag-draped body of her son, a rebel soldier, on All Saints day, Nov. 1



Below: Escaping to freedom after Soviet forces crushed the rebellion, refugees cross an improvised footbridge at the Austro-Hungarian border



more lives. From Nov. 12 fighting was sporadic, but a general strike continued in factories and mining districts. Incomplete but not unfounded reports told of numerous deportations to the Soviet Union. The clear fact emerged that Hungary had developed a national movement which unanimously rejected any co-operation with the U.S.S.R. Reliable witnesses said that serious dissension began within the Soviet ranks, and the duration of the unequal struggle was widely attributed to this circumstance. (See also COMMUNISM; UNITED NATIONS.) (B. Mr.)

Education.—Schools (1954): nursery, pupils 144,000, teachers 4,300; primary 6,185, pupils 1,208,000, teachers 46,100; secondary 405, pupils (including those enrolled for evening courses) 162,500, teachers 7,500; vocational, pupils 57,000; institutions of higher education 21 (including 5 universities), students 47,500, teaching staff 7,200.

Finance.—Budget (1955 est.; 1956 est. in parentheses): revenue 46,961,000,000 (43,300,000,000) forints; expenditure 45,458,000,000 (42,100,000,000) forints, including 25,200,000,000 (22,439,000,000) forints invested in the national economy. Monetary unit: forint with official exchange rate, high and fictitious, of 11.74 forints to the U.S. \$1.

Foreign Trade.—(UN Economic Commission for Europe's estimates, in U.S. dollars, 1954.) Trade turnover with all countries \$950,000,000, including \$660,000,000 with the countries of the Communist group.

Transport and Communications.—Highways (1955): 39,569 mi. Licensed motor vehicles (Dec. 1955): cars 15,000, commercial 27,300. Railways (1951): 7,100 mi. Air transport (1948): flights 4,447; mileage flown 625,000; passengers carried 36,111. Danube shipping (Dec. 1947): merchant vessels 514, gross tonnage 118,700. Telephones (1954 est.): 122,000. Radio receiving sets (1953): 887,000.

Agriculture.—Main crops (metric tons, 1934-38 average; 1955 in parentheses): wheat 2,220,000 (2,130,990); maize 2,306,000 (2,911,710); rye 697,000 (544,270); barley 608,000 (794,380); oats 270,000 (1948-50 average) 265,000; potatoes 2,133,000 (2,467,030); sugar beets 960,000 (2,240,760); rice (1948-51 average) 44,000. Wine production (1938; 1948-50 average in parentheses): 3,259,000 hl. (3,120,000 hl.). Livestock (1939; 1955 in parentheses): cattle 1,882,000 (2,128,000); pigs 5,224,000 (6,000,000); sheep 1,868,000 (1,857,000); horses 939,000 (550,000).

Industry.—Production (metric tons if not otherwise stated, 1938; 1955 in parentheses): coal 1,042,000 (1,920,000); lignite 8,306,000 (20,800,000); crude petroleum 43,000 (1,600,000); electricity 1,280,000,000 (5,442,000,000) kw.hr.; pig iron 335,000 (854,000); steel 648,000 (1,923,000); bauxite 540,000 (1,290,000); aluminum 1,300 (37,000); cement 343,000 (1,175,000); sulphuric acid (1955) 124,000; cotton fabrics (1955) 278,000,000 sq.yd.; leather shoes (1955) 13,900,000 pairs; sugar 27,000 (248,000).

Hunting: see WILDLIFE CONSERVATION.

Hurdling: see TRACK AND FIELD SPORTS.

Hutchins, Robert Maynard (1899—), U.S. educator, was born on Jan. 17 in Brooklyn, N.Y. He left Oberlin college, Oberlin, O., in 1917 to serve in the U.S. ambulance corps during World War I. Entering Yale university, New Haven, Conn., in 1919, he received his A.B. in 1921 and his LL.B. (*magna cum laude*) in 1925. In 1923 he was appointed secretary of Yale university and in 1927 dean of its law school. In 1929, at the age of 30, he became the fifth president (and, in 1945, the first chancellor) of The University of Chicago.

Hutchins resigned in 1950 (effective June 30, 1951) as chancellor of the university and as a member of its board of trustees to join the Ford foundation as an associate director. He continued as chairman of the board of editors of Encyclopædia Britannica, Inc.

On May 24, 1954, the Fund for the Republic, an independent organization established in 1953 with a grant of \$15,000,000 outright from the Ford foundation, announced the election of Hutchins as its president. The purpose of the fund was to help remove restrictions on freedom of expression and thought in the United States. On Jan. 13, 1955, the fund announced a \$250,000 survey of the influence of communism on all phases of U.S. life. Seaborn P. Collins, national commander of the American Legion, attacked this survey as an attempt to show that communism was no particular menace to democracy. Other members of the Legion, however, defended the fund's objectives.

Replying to a request from Chairman Francis E. Walter of the House committee on un-American activities that directors and officers of the Fund for the Republic declare whether they were "friend or foe" of U.S. anticommunist campaigns, Hutchins wrote

Walter on July 11, 1956, that the congressman had unjustly questioned their patriotism.

Hydroelectric Power: see FEDERAL POWER COMMISSION.

Hydrogen Bomb: see ATOMIC ENERGY.

ICC: see INTERSTATE COMMERCE COMMISSION.

Ice Hockey: see HOCKEY, ICE.

Iceland. An island republic of the North Atlantic, Iceland has an area of 39,768 sq.mi. and a population of (1950 census) 144,263; (1956 est.) 160,000. The capital, Reykjavik, is the only large town (pop. 1953 estimate 60,024). Religion: Lutheran Christian. President in 1956: Asgeir Asgeirsson. Prime minister, Olafur Thors until July 1956, thereafter Hermann Jonasson.

History.—The long simmering problem of U.S. troops at Keflavik air base boiled over in 1956. The restlessness of the Icelanders was rooted deeply in national sensitivity, and economic difficulties also played a powerful role. Inflation accompanied prosperity, and even the funds brought in for construction at the air base seemed to some persons merely to raise prices and enhance troubles. The fishing fleet, mainstay of the country's economy, refused to go out for the winter season until promised a government subsidy. By June the wage-price spiral had risen 22 points in a year. Furthermore, neither the United States nor Great Britain would buy Iceland's fish, the country's only important export. The U.S.S.R. took the fish and provided petroleum and other products in return.

Political ambitions and rivalries exacerbated problems and controversies. The government had been a coalition of the Independence (conservative) and Progressive (centre-to-left) parties. Foreign Minister Kristinn Gudmundsson and his Progressive colleagues came increasingly to feel their affinity with the Social Democrats and to join the left parties in opposition to the presence in the country of foreign troops. The authorizing treaty, signed in 1951 during the Korean conflict, was part of Iceland's co-operation in the North Atlantic Treaty organization (NATO),



"SPLOSH!" a 1956 cartoon by Dobbins of the Boston Post (Mass.)

but provided for United States troops at Keflavik only in time of war. Four thousand soldiers just outside a city of 60,000 population inevitably created tensions. Were these troops necessary? Most Icelanders thought not, and the Communists were bitterly antagonistic. In March 1956 the Progressives joined with the parties of the left, including the isolationist National Preservation party, to vote 38-18 in the *althing* to demand withdrawal of the U.S. forces. This decision split the coalition and led to an election on June 24, one year earlier than normal.

In the hotly debated contest 90% of the voters went to the polls. The representation of the National Preservation party was wiped out, but the Progressive-Social Democrat alliance won 25 of the 52 seats in the *althing*; the Independence party won only 19 seats, although polling 43% of the popular vote. Eight Communists were elected, and in the post-election manoeuvring they joined with the Progressives and Social Democrats to form a new coalition (July 21), each party having two posts in the six-member cabinet. Hermann Jonasson, Progressive, became premier, and Gudmundur I. Gudmundsson, a right-wing Social Democrat, became foreign minister.

Despite the recommendation of the NATO council, Iceland made formal request on Aug. 1 for the withdrawal of the United States forces. The government professed continuing solidarity with NATO, but no one outside Iceland seemed to think Iceland was capable of defending itself. (F. D. S.)

Education.—In 1954 there were 224 elementary schools with 15,566 pupils and 708 teachers, 56 secondary schools with 4,586 pupils and 367 teachers, 3 grammar schools with 841 pupils and 55 teachers and 49 other schools with 3,507 pupils and 339 teachers. The University of Iceland had 692 students and 61 professors and lecturers.

Finance.—The monetary unit is the króna, valued at 6.14 cents, U.S. currency, official rate, in 1956. The 1956 budget balanced revenue and expenditure, current and capital, at 661,696,000 kr. The national debt (Dec. 31, 1954) was 473,108,000 kr., including external debt of 214,006,000 kr. Currency in circulation (June 30, 1956) was 335,590,000 kr. National income (gross national product at factor cost) was estimated at 2,460,000,000 kr. in 1954. The cost-of-living index (Reykjavik) stood at 115 in June 1956 (1953=100).

Trade and Communications.—Exports in 1955 totalled 847,833,000 kr.; imports, 1,264,294,000 kr. Leading exports were fish and fish products (93%), hides and skins (3%) and wool (2%); leading imports, petroleum products (12%), wood (4%), iron and steel (4%) and cement (2%). Leading customers were the U.S.S.R. (18%), the U.S. (12%), the U.K. (8%) and Italy (8%); leading suppliers, the U.S. (23%), the U.S.S.R. (14%), the U.K. (11%) and western Germany (10%).

Motorable roads (1956) totalled about 5,500 mi. Registered motor vehicles (Jan. 1, 1956) included 7,812 automobiles, 5,471 trucks and 328 buses. In Oct. 1955 the merchant marine had 686 vessels aggregating

97,975 gross tons, including the fishing fleet of 44 trawlers and 597 other vessels aggregating 54,531 tons. Telephones (1955) numbered 25,457; radios (1956), 50,000.

Fisheries and Livestock.—In 1955 the sea fisheries yielded 408,952 metric tons, including 170,254 tons of frozen fish and 141,193 tons of salted fish. Livestock (Jan. 1, 1956) included 635,080 sheep, 47,328 cattle and 37,181 horses. Wool production (1955) was 600 metric tons. (J. W. Mw.)

Ice Skating. Hayes Alan Jenkins of Colorado Springs, Colo., scored a grand slam in international competition in 1956 when he won the Olympic, world and United States championships. Jenkins captured his fourth straight world title at Garmisch-Partenkirchen, Ger., in February. Ronald (Ronnie) Robertson of Long Beach, Calif., was a close second and Jenkins' younger brother David was third. The same trio finished first, second and third at Cortina d'Ampezzo, It., in January for the best United States showing in the 1956 Winter Olympic games. (See also OLYMPIC GAMES.) Carol Heiss, 16-year-old skater from Ozone Park, N.Y., who was second to Tenley Albright of Newtown Center, Mass., in the Olympics, dethroned her American rival in the world competition. Miss Albright was second and Ingrid Wendl of Austria was third. The pairs championship went to the Austrian team of Elisabeth Schwartz and Kurt Oppelt with the defenders, Frances Dafoe and Norris Bowden of Toronto, Can., a close second.

Misses Albright and Heiss met in competition for the ninth time in three years in the national championships at Philadelphia, Pa., March 14-17. Miss Albright won her fifth consecutive United States crown after a close contest with Miss Heiss. Hayes Alan Jenkins carried home the men's senior national prize for the fourth straight time, with Ronnie Robertson again his closest adversary and David Jenkins third. Other winners included Carole Ann Ormaca and Robin Greiner of the St. Moritz Skating club of Berkeley, Calif., senior pairs; Bob Hubbard of Sacramento, Calif., men's novice singles; Barbara Roles of Pasadena, Calif., women's novice; Robert Lee Brewer of Pasadena, men's junior; Joan Schenke of Tacoma, Wash., women's junior; Aileen Kahre and Charles Phillip, Jr., of Berkeley, silver dance prize; Joan Zamboni and Roland Junso of Paramount, Calif., gold dance title; and Nancy Rouillard and Ronald Luding-

ICE HURDLER Leo LeBel attempting unsuccessfully to clear 15 barrels at Lake Placid, N.Y., Jan. 7, 1956. On a later try he jumped over 16 barrels to set a world's record and retain the title he had won in 1955



ton of Boston, Mass., junior pairs.

At the close of the national meet, Ronnie Robertson joined the professional ranks; Hayes Jenkins turned professional in May.

Speed Skating.—Ken Bartholomew of Minneapolis, Minn., and Pat Gibson of Madison, Wis., starred in the national outdoor championships at St. Paul, Minn., Jan. 28–29. By defeating Dick Wellbank of Chicago, Ill., by 2 yd. in the final event of 5 mi., Bartholomew was able to win his seventh consecutive men's senior title. In addition to taking the 5-mi. test, Bartholomew led home the fields in the 2 mi. and 880-yd. races. Miss Gibson gained her fourth national title with a sweep of the senior women's five contests. Kathleen Harrington of Syracuse, N.Y., was juvenile girls' champion and Paul Nelson of Minneapolis led the juvenile boys. Bartholomew and Miss Gibson had previously retained honours in the Great Lakes championships at Milwaukee, Ken winning six events while Miss Gibson swept five races for feminine competitors. The same winners led their respective divisions in the North American title meet at West Allis, Wis., Feb. 4–5. Kenneth LeBel of Lake Placid, N.Y., triumphed in the men's senior group at the United States indoor meet at Flushing Meadow Park rink in New York, the women's title going to Mickey Finch of Ozone Park, N.Y. LeBel also took North American honours indoors, the senior women's title being won by Pat Underhill of Dawson Creek, B.C.

The U.S.S.R. dominated the men's world speed-skating championships at Oslo, Nor., and the women's international title tests held in Sweden. (T. V. H.)

Idaho. One of the far northwestern states of the United States, belonging to the group regionally designated as the Pacific northwest and part of the original Oregon territory, Idaho was admitted as a state on July 3, 1890; it is popularly known as the "Gem state." Area: 83,557 sq.mi. Pop. (1950 census): 588,637, of whom 57.1% were rural, 42.9% urban; 61,988 native white, 19,407 foreign born white; 1,050 Negro, 1,192 other races. The provisional population estimate of the census bureau as of July 1, 1956, was 625,000.

The largest cities with their populations (1950 census) are: Boise (cap.) 34,393; Pocatello 26,131; Idaho Falls 19,218; Twin Falls 17,600; Nampa 16,185; Lewiston 12,985; Coeur d'Alene 12,198; Moscow 10,593; and Caldwell 10,487.

History.—Hydroelectric power and natural gas probably drew more headlines in Idaho during 1956 than any other items.

The hydroelectric power problem centred around the efforts of a privately owned, taxpaying electric utility to go forward with its efforts to build three dams in Snake river canyon between Idaho and Oregon, in the face of persistent efforts by advocates of federal dam construction to thwart these efforts. Appeals from the award of the Federal Power commission of a licence for construction of one of the dams were carried to the courts, while the company, after posting a bond, proceeded with the building of power-generating facilities needed to meet the growing demands of the area. A bill in congress for authorization of the federal Hells Canyon dam was defeated in the senate.

Idaho, along with other northwestern states, received its first natural gas during 1956. A unique attempt was made by a dozen Idaho cities to set up co-operative associations to supply the pipeline gas to consumers. This procedure was resorted to because of statutory restrictions against issuing revenue bonds for financing such municipal enterprises and because the cities could not otherwise finance the operations. The highest state court was called upon to pass judgment on the proposal.

The 1955 Idaho legislature created three interim study committees, with instructions to bring to the 1957 session recommendations on revision of the state tax structure, the teacher

training facilities of the state and the status of the minimum education program in Idaho. In each instance the committee was made up of both nonmembers and members of the legislature, and small appropriations were provided.

In the Nov. 6, 1956, election in Idaho, Pres. Dwight D. Eisenhower polled a majority of about 60,000 votes over Adlai E. Stevenson. Frank Church (Dem.) was elected to the U.S. senate and Mrs. Gracie Pfost (Dem.) and Hamer H. Budge (Rep.) were re-elected to the house of representatives.

Incumbent state officials, whose terms were to expire Jan. 1, 1959, were: governor, Robert E. Smylie (Rep.); lieutenant governor, J. Berkeley Larsen (Rep.); attorney general, Craydon Smith (Rep.); secretary of state, Ira Masters (Dem.); treasurer, Mrs. Ruth Moon (Dem.); auditor, N. P. Nielson (Rep.); mine inspector, George McDowell (Rep.); superintendent of public instruction, Alton P. Jones (Rep.).

Education.—Enrolment in Idaho schools of approximately 150,000 students in the 1956–57 school year in 486 elementary and 158 secondary schools represented an increase of approximately 26% over the number enrolled in 1940. There were approximately 5,000 teachers employed in the state.

In addition to the Lewis and Clark Normal school at Lewiston, the state maintains the University of Idaho at Moscow (it is also the state agricultural college) and the Idaho State college at Pocatello. Junior colleges in Idaho are operated under statutes creating districts and receive some state as well as local support. There are such colleges at Boise, and at Coeur d'Alene. Private colleges are Ricks college at Rexburg, College of Idaho at Caldwell and Northwest Nazarene college at Nampa.

Social Insurance and Assistance, Public Welfare and Related Programs.—At the end of the fiscal year, June 30, 1956, the number of old-age assistance recipients totalled 8,367 compared with 8,729 in July 1955, while average payments in June 1956 were \$55.53 compared with \$54.92 in July 1955. It was estimated that 16.7% of the population of Idaho aged 65 and over was receiving old-age assistance.

Average weekly benefit payments under unemployment compensation during the year ending June 30, 1956, were \$26.30 compared with \$22.85 during the preceding year, for a total of \$4,027,201 compared with \$4,549,844 in the preceding fiscal year. Total receipts to the fund during the year amounted to \$5,322,421, of which \$815,123 represented interest. The fund balance stood at \$35,757,620 at the end of the fiscal year compared with \$34,454,222 at the previous year end, or an increase of \$1,303,398. The number of covered employers remained practically stationary during the year at slightly more than 13,100.

Communications.—The state highway system, administered by the Idaho Highway board, covers approximately 5,000 mi. of roads and has a normal annual program of about \$28,000,000. Four transcontinental railroads, with a combined mileage within Idaho of 2,738 mi., serve the state. Air transportation is furnished by United, Western and West Coast air lines. Telephones in service exceed 161,000, a gain of more than 85% since 1945.

Banking and Finance.—Ten national banks with 56 branches reported total deposits of \$393,353,855.85, and 25 state banks with 9 branches reported deposits of \$121,414,083.70 at the beginning of 1956.

The Idaho state budget for the fiscal biennium ending June 30, 1957, totalled \$134,094,107, including \$49,552,169 from the state general fund and \$84,541,938 from other funds and sources. This was an increase of \$15,584,756, or 13% over the \$118,509,351 appropriated for the biennium which ended June 30, 1955. Major expenditures authorized were highways \$51,850,000, education \$33,300,000 and public welfare \$24,425,000.

Agriculture.—Final figures for the 1955 Idaho farm income were: live-stock and livestock products marketed \$141,003,000, crops \$192,829,000,

Table I.—Principal Crops of Idaho

Crop	Indicated 1956	1955	Average, 1945–54
Wheat, bu.	38,980,000	38,165,000	38,985,000
Corn, bu.	3,776,000	3,410,000	1,633,000
Oats, bu.	8,272,000	9,700,000	7,934,000
Barley, bu.	16,315,000	19,584,000	12,345,000
Sugar beets, short tons	1,540,000	1,433,000	1,296,000
Beans, 100-lb. bags.	2,052,000	2,370,000	2,194,000
All hay, tons.	3,187,000	2,971,000	2,460,000
Potatoes, cwt.	33,115,000	31,200,000	24,684,000
Apples, bu.	1,650,000	1,630,000	1,583,000

Source: U.S. Department of Agriculture.

Table II.—Mineral Production of Idaho

(Short tons, except as noted)

Mineral	Quantity 1953	Value 1953	Quantity 1954*	Value 1954*
Total		\$67,000,000		\$69,693,000
Antimony ore.	2,000	†	5,000	†
Copper	3,000	1,800,000	5,000	2,849,000
Gold (oz.)	18,000	617,000	13,000	464,000
Lead	75,000	19,548,000	69,000	18,989,000
Mercury (flasks, 76 lb.)	†	†	609	161,000
Phosphate rock	†	4,150,000	†	5,687,000
Pumice and pumicite	85,000	160,000	94,000	184,000
Sand and gravel	3,776,000	2,841,000	6,718,000	4,569,000
Silver (oz.)	14,640,000	13,250,000	15,867,000	14,361,000
Stone	1,142,000	2,261,000	2,309,000	3,013,000
Tungsten concentrate.	441	1,666,000	471	1,774,000
Zinc	72,000	16,595,000	62,000	13,290,000
Other minerals	—	4,112,000	*	4,352,000

*Preliminary †Value included with other minerals.

Source: U.S. Bureau of Mines.

government payments \$4,804,000, home consumption \$11,099,000; total \$349,735,000, compared with \$350,931,000 income in 1954.

Manufacturing.—Value added by manufacturing in the forest products industry in the amount of \$79,200,000 in 1954 led all types of manufacturing, out of a total of approximately \$188,000,000 added in that year. Mine production totalled about \$70,000,000 in 1954, and there were 250,700 freight cars loaded in 1954. Out of a total of 23,658 nonagricultural employment in 1954, lumbering accounted for 12,133, food processing 6,533 and other manufacturing 4,992.

Mineral Production.—Table II shows the tonnage and value of Idaho's minerals in 1953 and 1954 whose value exceeded \$100,000. Almost all antimony produced in the U.S. in 1954 came from Idaho. The state has been first among the states in silver output since 1943 and was also first in zinc output in 1954, second in ilmenite and in lead mined, third in phosphate rock, fifth in pumice, and ranked 29th in the value of its mineral output, with 0.50% of the U.S. total.

ENCYCLOPEDIA BRITANNICA FILMS.—*Northwestern States*, 2nd ed. (1956).

Illinois. A north central state of the United States, admitted to the union in 1818 as the 21st state, Illinois is nicknamed the "Sucker state" and is sometimes called the "Prairie state." The official state slogan is "Land of Lincoln." Total area: 56,400 sq.mi., of which 55,935 sq.mi. are land. Population (1950 census): 8,712,176, an increase of 10.3% or 814,935 over 1940. The 1950 census showed 4,319,251 males and 4,392,925 females; 8,046,058 white, 666,118 nonwhite. Population classed as urban in 1950 was 6,759,271 or 77.6%; as rural, 1,952,905 or 22.4%.

The July 1, 1955, population estimate was 9,361,000. The provisional estimate by the U.S. census bureau for July 1, 1956, was 9,432,000. Chicago (1950 population, 3,620,962) is the largest city, followed by Peoria (111,856), Rockford (92,927), East St. Louis (82,295) and Springfield, the capital (81,628).

History.—Orville E. Hodge, state auditor (elected for a four-year term expiring Jan. 1957), was ousted from office when investigation proved that he had misappropriated more than \$1,000,000 in state funds. He was sentenced in Aug. 1956 to serve 12 to 15 years at the Menard state prison. Lloyd Morey, former president of the University of Illinois, was appointed by Governor Stratton to fill Hodge's unexpired term as auditor.

A special census conducted by the Population Research and Training centre of The University of Chicago for the Illinois department of public health showed that the state population was 9,361,000 as of July 1, 1955. This was an increase of 648,000 or 7% over the 1950 census. The census also showed that the median age of the population advanced from 32.7 years in 1950, to 33.2 years in 1955; that the nonwhite population increased from 7.7% of the state's population in 1950, to 9% in 1955; that the number of cities of 10,000 or over increased from 72 in 1950, to 86 in 1955; and that 91% of the state's 1950-55 population increase occurred within 13 metropolitan counties.

The Nov. 6, 1956, general election in Illinois was a landslide when Pres. Dwight D. Eisenhower led the state Republican ticket to complete victory.

President Eisenhower won Illinois' 27 electoral votes when he ran up more than a 800,000 vote plurality over the Democratic candidate Adlai Stevenson. Illinois voters elected Everett M. Dirksen (R.) over Richard Stengel (D.) for the U.S. senate and gave the Republicans 14 out of 25 seats in the U.S. congress. Republican candidates won all state offices, a 38 to 19 majority in the state senate and a 94 to 83 majority in the state house of representatives. State officers elected (all Republican) were: William G. Stratton, governor; John W. Chapman, lieutenant governor; Charles F. Carpentier, secretary of state; Elbert S. Smith, auditor of public accounts; Elmer J. Hoffman, treasurer; Latham Castle, attorney general; Mrs. Earle B. Searcy, clerk of the supreme court; Wayne A. Johnston, Timothy W. Swain and Earl M. Hughes, trustees of the University of Illinois.

Education.—Estimated enrolment in the state's 2,242 public school districts for the 1956 fall term was 1,506,221 as compared with 1,502,727 in 1955. Enrolment was divided between 1,604 elementary school districts,



ORVILLE E. HODGE, former state auditor of Illinois, entering prison in Aug. 1956 to begin a 12-15 yr. sentence for the theft of state funds

306 secondary school districts and 332 unit school districts. There were 38,042 teachers for 1,136,865 pupils in the first eight grades, and 16,440 teachers for 369,356 students in the secondary grades. In addition to the public school districts, there were 973 private elementary schools with an enrolment of 355,789; 178 private secondary schools with an enrolment of 71,428; and 69 institutions of higher education in Illinois in 1956. The legislative appropriation for state aid to schools in the 1955-57 biennium was \$224,300,000. This increase of \$56,915,374 over the previous biennium increased the aid per pupil from \$173 to \$200 per school year. Vernon L. Nickell was the superintendent of public instruction in 1956.

Social Insurance and Assistance, Public Welfare and Related Programs.—Gross expenditures under the state's public assistance programs totalled \$157,710,000 in the fiscal year ending June 30, 1956, an increase of \$3,745,000 over the preceding year. The number of persons dependent upon public aid decreased from 282,220 to 274,821 in the same period. In the fiscal year closing June 30, 1956, the Illinois public aid commission reported the following average monthly number of recipients of public assistance and the average payments to each (preceding year's figures in parentheses): old-age pensions, 92,758, \$60.80 (97,801, \$58.66); aid to dependent children, 88,619, \$34.24 (80,017, \$33.43); blind assistance, 3,491, \$67.40 (3,600, \$63.92); disability assistance, 6,908, \$81.55 (5,872, \$79.04); general assistance, 83,816, \$37.34 (94,952, \$34.40). In addition the state expended \$6,486,000 in the 1955-56 fiscal year for burials of public assistance recipients and medical aid to the indigent.

The average weekly number of unemployment compensation claimant, during 1956 through the week ended Aug. 31, 1956, was 63,325 as compared with 107,200 during the corresponding period of the preceding year.

In the state's five penal institutions the average daily population during Aug. 1956 was 9,389, an increase of 321 over the same month of 1955. On Sept. 1, 1956, 21 state welfare institutions showed an average daily population of 49,472, a decrease of 505 from the Sept. 1, 1955, figure. These institutions, and their populations were (Sept. 1, 1955, figures in parentheses): 13 mental hospitals, 47,415 (47,808), 8 educational institutions and homes, 2,057 (2,169). Three correctional institutions and four forestry camps under the supervision of the Illinois youth commission had an average daily population of 1,259 during Aug. 1956, as compared with 1,210 during Aug. 1955, when there were three correctional institutions and only two forestry camps.

Communications.—Contracts for highway construction work in the first nine months of 1956 totalled \$68,932,206. Illinois, with a 12,000 mi. primary highway system, contains 125,000 mi. of roads, 104,000 mi. rural. Construction of the state's 193 mi. toll road network began in Sept. 1956.

There were 65 railroads (58 steam and 7 electric) operating in Illinois during 1956. These trains ran on 11,542 mi. of track through 80% of the state's communities. In 1956 there were 17 scheduled airlines and 97 bus companies serving the various communities in the state. On Sept. 1, 1956, there were 3,447,572 motor vehicles (all types) registered in Illinois. Navigable waterways, internal and bordering, totalled 1,147 mi.

Banking and Finance.—There were 924 banks operating in the state on June 30, 1956, 10 more than on the same date of the preceding year. Of this number, 532 were state banks and 392 national banks. State banks on June 30, 1956, showed total deposits of \$4,428,739,317 and total resources of \$4,753,818,762. National banks on the same date had total deposits of \$10,792,745,000 and total resources of \$11,732,409,000.

For the biennium ending June 30, 1957, Gov. William G. Stratton approved legislation appropriating \$1,736,250,557 to operate the state government. As of June 30, 1956, \$838,670,272 was expended, leaving a balance of \$897,580,285.

In the first eight months of 1956, major sources of state income produced the following amounts (1955 comparative figures in parentheses): sales tax, \$184,730,887 (\$146,737,909); motor fuel tax, \$97,982,381 (\$94,372,292); motor vehicle registrations, \$78,969,975 (\$69,160,994)

cigarette tax, \$22,134,296 (\$20,679,154); public utility tax, \$22,757,294 (\$20,923,407); liquor gallonage tax, \$17,324,740 (\$16,075,254).

Agriculture.—Almost 86% of the total land area of Illinois is in farms; its 179,341 farms were valued in 1955 at more than \$7,121,000,000. The average farm size was 172.6 ac.

Illinois grows 43 different field crops on 30,963,309 ac. Corn is the largest crop; hog production provides the greatest income to the farmer.

Table I.—Principal Crops of Illinois

Crop	Indicated 1956	1955	Average, 1945-54
Corn, bu.	586,674,000	523,992,000	467,584,000
Soybeans, bu.	135,632,000	98,325,000	83,096,000
Oats, bu.	139,886,000	177,408,000	141,595,000
Wheat, bu. (all)	58,108,000	52,008,000	36,561,000
Barley, bu.	3,924,000	4,760,000	1,022,000
Rye, bu.	1,365,000	1,700,000	759,000
Hay, tons (all)	4,699,000	4,690,000	4,254,000
Apples, bu.	2,550,000	1,430,000	1,300,000
Peaches, bu.	1,100,000	130,000	1,597,000
Pears, bu.	200,000	90,000	199,000
Grapes, tons	1,400	1,300	2,060

Source: U.S. Department of Agriculture.

Table II.—Principal Livestock in Illinois

Livestock	Value 1956	1955	Average, 1945-54
Cattle (all)	\$386,688,000	\$371,545,000	\$443,294,000
Sheep	9,881,000	10,249,000	12,059,000
Hogs	117,642,000	181,943,000	204,331,000
Horses and mules	4,118,000	3,995,000	12,762,000
Chickens	20,006,000	16,698,000	29,118,000
Turkeys	336,000	306,000	591,000

Source: U.S. Department of Agriculture.

Manufacturing.—The value added by manufacturing to Illinois products in 1954 was \$9,641,592,000 as compared with \$10,111,624,000 in 1953. Manufacturing industries employed an average 1,183,381 workers during 1954 as compared with 1,316,089 during 1953. Salaries and wages of manufacturing workers totalled \$5,155,944,000 in 1954 as compared with \$5,668,441,000 in 1953.

Total nonagricultural employment in Illinois stood at 3,412,200 in Aug. 1956, as compared with 3,314,200 in Aug. 1955. (D. F. H.)

Table III.—Principal Industries of Illinois

Industry	Value added by manufacturing 1954	1953
Machinery (except electrical)	\$1,659,111,000	\$1,726,156,000
Food and kindred products	1,307,841,000	1,276,711,000
Electrical machinery	1,017,756,000	1,146,879,000
Fabricated metal products	927,676,000	964,487,000
Primary metal industries	816,449,000	945,776,000
Printing and publishing industries	752,288,000	713,386,000
Chemicals and allied products	656,886,000	654,975,000
Transportation equipment	503,372,000	528,636,000
Miscellaneous manufactures	348,713,000	389,248,000
Paper, clay and glass products	258,351,000	289,988,000
Instruments and related products	240,327,000	256,704,000
Textile and allied products	224,133,000	251,034,000
Apparel and related products	232,017,000	249,247,000
Petroleum and coal products	215,244,000	225,605,000
Furniture and fixtures	178,572,000	184,621,000
Leather and leather products	117,344,000	122,464,000

Source: U.S. Department of Commerce, Annual Survey of Manufactures, 1954.

Table IV.—Mineral Production of Illinois

(Short tons, except as noted)

	Quantity 1953	Value 1953	Quantity 1954	Value 1954
Total	462,443,000	\$462,443,000	473,077,000*	\$473,077,000*
Cement (bbl.)	8,651,000	21,962,000	9,109,000	23,148,000
Clays	2,305,000	4,573,000	2,027,000	3,482,000
Coal	46,010,000	181,598,000	41,971,000	160,213,000
Coke†	3,513,000	59,550,000	2,248,000	38,970,000
Fuorspar	163,000	8,567,000	108,000	5,989,000
Iron, pig†	6,532,000	325,583,000	4,535,000	227,160,000
Lead (tons)	3,000	888,000	3,000	886,000
Mercury	520,000	6,987,000	532,000	7,421,000
Natural gas (000 cu.ft.)	9,282,000	1,559,000	9,475,000	1,345,000
Petroleum (bbl.)	59,026,000	170,590,000	66,798,000	199,060,000
Petroleum gases (bbl.)	?	?	?	?
Sand and gravel	21,522,000	20,541,000	24,443,000	26,164,000
Sandstone (ground)	276,000	2,462,000	?	?
Silver	22,939,000	29,737,000	26,407,000	31,134,000
Sulfuric acid†	120,000	2,148,000	?	?
Zinc	15,000	3,348,000	14,000	3,116,000
Other minerals	...	9,631,000	...	13,063,000

*Total has been adjusted to eliminate duplication in the value of clays and stone. †Values for processed materials are not included in the totals. ‡Value included in other minerals. §Included with sand and gravel.

Source: U.S. Bureau of Mines.

Mineral Production.—Table IV shows the tonnage and value of mineral commodities in Illinois in 1953 and 1954 whose value was \$100,000 or more. In 1954 Illinois was first among the states in fuorspar output, second in asphalt, fourth in pig iron and stone and fifth in fire clay and pumice. A substantial quantity of coke was produced, as well as an important quantity of zinc. Illinois was seventh in value of its mineral output, with 39% of the U.S. total in 1954.

ENCYCLOPEDIA BRITANNICA FILMS.—*Illinois* (1955); *The Middle West*, 2nd ed. (1955).

Immigration, Emigration and Naturalization.

Total arrivals in the United States reached an all-time high of 63,024,943 U.S. citizens and 71,115,577 aliens during the year ended June 30, 1956. As in past years, 97% of all arrivals were alien and citizen border crossings over the Canadian and Mexican borders. The remainder included immigrants, crewmen and other nonimmigrants admitted for temporary visits, as well as citizens arriving from countries other than Mexico and Canada.

United States Immigrants.—During the year ended June 30, 1956, there were admitted to the United States 321,625 immigrants for permanent residence, the highest number admitted since 1927 and an increase of 35% over the 237,790 admitted during the preceding year.

Factors that in part accounted for the rise in immigration include the refugees admitted under the Refugee Relief act of 1953 and a 32% increase in the admissions of natives of western hemisphere countries.

Table I shows the major countries of birth of the immigrants admitted.

Table I.—Immigrant Aliens Admitted to the United States by Classes and Principal Countries of Birth, Year Ended June 30, 1956

Country or region of birth	Total admitted	Quota immigrants	Spouses and children of U.S. citizens	Natives of western hemisphere countries, their spouses and children	Refugees	Other non-quota immigrants
All countries	321,625	89,310	31,742	124,032	75,473	1,068
Europe	175,555	83,555	20,281	1,489	69,797	433
France	4,308	2,663	1,296	29	312	8
Germany	38,390	24,873	7,460	76	5,931	50
Ireland	6,483	6,418	30	16	16	9
Italy	39,789	5,769	4,484	359	29,108	69
Netherlands	5,134	3,136	342	29	1,606	21
United Kingdom	21,582	20,521	254	364	396	47
Other Europe	59,869	20,175	6,415	616	32,434	229
North America	119,417	1,149	1,709	115,835	219	505
Canada	29,533	2	111	29,113	4	303
Mexico	65,047	1	47	64,906	2	91
West Indies	19,022	902	1,442	16,592	17	69
Central America	4,981	90	60	4,824	...	7
Other North America	834	154	49	400	196	35
South America	6,846	159	114	6,562	5	6
Asia	17,538	3,111	9,044	84	5,194	105
Africa	1,441	835	340	27	234	5
Australia and New Zealand	602	357	197	33	6	9
Other countries	226	144	57	2	18	5

Source: Immigration and Naturalization Service, United States Department of Justice.

A total of 89,310 quota immigrants, chiefly from Europe, were admitted and charged to the established quota of 154,657. While quota immigration was 9% higher than during the preceding year, it was still only 58% of authorized quotas, partly because only 26,939 quota immigrants admitted in fiscal year 1956 were charged to the quotas of the United Kingdom and Ireland, which had a combined quota of 83,117.

Thus, 83% of the unused quotas for fiscal 1956 were those available to these two countries. Unused quotas for all other countries totalled 11,160.

Quota immigration continued to be low from countries of southern and eastern Europe, such as Czechoslovakia and Poland, which had mortgaged their quotas heavily under the Displaced Persons act of 1948, as amended.

Of the 89,310 quota immigrants admitted during 1956, 15,296, or 17%, were admitted under preference as established under the Immigration and Nationality act. During the year, 3,366 selected immigrants of special skill or ability were admitted as first preference quota.

Nonquota immigration in 1956 (232,315) was the highest since the passage of the Immigration act of 1924. The largest class of nonquota immigrants were natives of western hemisphere countries, their spouses and children (124,032). For the third consecutive year Mexico was the chief source of immigration, with 65,047 immigrants admitted during 1956.

Table II.—Maximum Visas Authorized and Immigrant Aliens Admitted to the United States Under the Refugee Relief Act of 1953, Through June 30, 1956

Class	Maximum Visas authorized	Number admitted
Total number	209,000	104,803
German expellees	55,000	16,758
Escapees	45,000	14,013
Italian refugees and relatives	60,000	50,118
Greek refugees and relatives	17,000	13,853
Dutch refugees and relatives	17,000	2,358
Orphans	4,000	2,290
Others	11,000	5,413

Source: Immigration and Naturalization Service, United States Department of Justice.

Table III.—Nonimmigrant Aliens Admitted to the United States, Years Ended June 30, 1955 and 56

Class	1955	1956
Total nonimmigrants admitted	686,259	620,946
Foreign government officials	27,109	26,288
Representatives to international organizations	5,190	6,003
Temporary visitors for business	72,265	68,696
Temporary visitors for pleasure	399,704	332,394
Transit aliens	65,214	71,301
Treaty traders and investors	1,619	1,203
Students	28,013	27,192
Temporary workers and industrial trainees*	17,077	9,750
Representatives of foreign information media*	697	575
Exchange aliens*	17,204	16,077
Returning resident aliens	52,136	61,442
Other nonimmigrants	31	25

*New classes under the provisions of the Immigration and Nationality act.

Source: Immigration and Naturalization Service, United States Department of Justice.

The second largest class of nonquota immigrants admitted were 75,473 refugees admitted under the Refugee Relief act of 1953. Since passage of the act and through June 30, 1956, a total of 104,803 refugees had been admitted.

Nonimmigrants.—Nonimmigrants are aliens who enter the United States for temporary periods or resident aliens returning from temporary visits abroad. The figures in Table III do not include such groups as agricultural labourers, border crossers and crewmen.

An all-time high of 686,259 nonimmigrants were admitted to the United States during the year ended June 30, 1956, an increase of 11% over the preceding year. Temporary visitors for pleasure, who numbered 399,704 during 1956, accounted for most of this increase.

The principal countries or regions of birth of the nonimmigrants admitted during 1956 were the West Indies (108,419), Mexico (96,866), England, Scotland and Wales (69,205), South America (50,502), Germany (45,307), Asia (44,111) and Italy (34,038).

Emigrants and Nonemigrants.—Emigrants are, by definition, aliens who depart from the United States after a residence of a year or more in the United States, with the intention of remaining abroad. During the year ended June 30, 1956, a total of 22,824 emigrants departed, including 2,784 to England, 2,599 to Canada, 2,995 to Asia, 1,930 to South America, 1,639 to Germany and 1,231 to the West Indies.

Nonemigrants are either resident aliens who depart for temporary visits abroad, or temporary visitors in the United States who return home after a stay abroad of less than one year. Of the 692,376 nonemigrants who left the U.S. during the year ended June 30, 1956, 69,189 were resident aliens leaving for temporary visits abroad, and 623,187 were aliens who entered as tourists, students, transit aliens, foreign government officials and others who had been in the United States for less than one year.

Apprehensions and Expulsions of Aliens.—In 1954 a concentrated drive was begun to apprehend and expel the increasing number of Mexicans illegally living in the United States. Control of the Mexican border was maintained from that time, and was a major factor in the relatively low number of apprehensions and expulsions during 1956. The number of apprehensions dropped from more than 1,000,000 in 1954 to 90,122 in fiscal year 1956.

Deportations during the year ended June 30, 1956, numbered 7,297, less than half of the 15,028 deportations in the preceding year, and included 16 aliens deported on subversive grounds, 818 deported on criminal, immoral or narcotic charges and 6,463 others. In addition, 80,891 aliens, principally Mexican illegal entrants, were granted voluntary departure.

Aliens in the United States.—Section 265 of the Immigration and Nationality act requires that in January of each year all aliens must notify the immigration and naturalization service of their current addresses.

A total of 2,622,462 aliens reported their addresses in January 1956, a gain of more than 100,000 over the preceding five years. Included in this total were 224,325 nationals of Mexico, 505,729 Canadians and British, 187,888 nationals of Poland and 76,089 nationals of the U.S.S.R.

Naturalizations.—In 1956 naturalizations numbered 145,885, which was 24% higher than the figure for 1954. Eighty per cent (117,161) of the naturalizations in 1956 were under the general provisions of the naturalization laws, 7,204 were military naturalizations, 18,224 were spouses of United States citizens and 3,296 were naturalized under other special provisions.

Included in the military naturalizations were 6,554 persons naturalized under public law 86, which provided for the naturalization of persons serving in the armed forces of the United States between June 24, 1950, and July 2, 1955. This act expired on Dec. 31, 1955.

During 1956, 798 persons who had lost their United States citizenship reacquired citizenship by repatriation. The majority were native-born women who lost citizenship through marriage to aliens. In addition, 20,264 certificates of citizenship were granted to persons who derived citizenship, usually through the naturalization of their parents. Certificates of citizenship were also issued to 7,748 persons who were born abroad to United States citizen parents and thereby acquired citizenship at birth.

Petitions of naturalization were denied in 3,935 cases during the year. The chief grounds were, as in the past, withdrawal of the petition by the petitioner and lack of prosecution.

The citizenship of 288 persons was revoked during 1956. In 276 cases the persons became residents of foreign states with-

Table IV.—Aliens Departed From the United States by Cause Years Ended June 30, 1951-56

Cause	1956	1955	1954	1953	1952	1951
All causes	7,297	15,028	26,951	19,845	20,181	13,544
Subversive or anarchistic	16	47	61	37	31	18
Criminals	628	666	783	689	778	1,036
Immoral classes	103	162	239	100	50	67
Violators of narcotic laws	87	96	105	53	40	62
Mental or physical defectives	80	69	43	48	56	45
Previously excluded or deported	316	366	336	276	539	940
Remained longer than authorized	133	225	401	1,561	4,469	3,289
Entered without proper documents	1,102	1,964	5,344	9,724	9,636	5,322
Failed to maintain status	462	346	644	387	475	298
Failed to comply with conditions of status	674	895	1,491	404	—	—
Entered without inspection or by false statements	3,545	10,061	17,337	6,387	3,706	2,293
Likely to become public charges	48	37	31	35	24	14
Miscellaneous	103	94	136	144	377	160

Source: Immigration and Naturalization Service, United States Department of Justice.

Table V.—Principal Countries of Former Allegiance of Persons Naturalized in the United States, Years Ended June 30, 1952-56

Country of former allegiance	1956	1955	1954	1953	1952
All countries	145,885	209,526	117,831	91,075	88,655
British	13,600	22,974	16,565	13,215	14,993
Canadian	11,539	18,151	13,062	10,073	10,004
German	16,230	17,842	11,679	12,923	13,538
Italian	9,549	16,128	10,926	9,675	9,720
Polish	17,256	27,777	8,542	6,912	5,858
Japanese	4,231	7,593	6,750	874	40
Irish	4,832	9,116	5,324	2,817	2,180
U.S.S.R.	7,771	8,627	3,832	2,644	2,851
Mexican	6,958	10,166	3,710	2,713	2,496
Other	53,919	71,152	37,441	29,429	26,975

Source: Immigration and Naturalization Service, United States Department of Justice.



VIET SEAMEN leaving U.S. Immigration building, Washington, D.C., April 27, 1956, after seeking asylum in the U.S. following the interception of their ship by Chinese Nationalist forces

five years after naturalization. A total of 4,987 persons lost citizenship through expatriation.

New Legislation.—During the fiscal year 1956, six bills affecting laws administered by the immigration and naturalization service were enacted into law, including the following:

Public law 149, approved July 12, 1955, extended for two years until June 30, 1957, the authority for enlistment of aliens in the regular army authorized by the act of June 30, 1950, as amended by title ii of the act of June 19, 1951, and section 402 (e) of the Immigration and Nationality act. These statutes authorize enlistment of not to exceed 12,500 aliens in the regular army. Each enlisted alien is entitled to certain benefits if they apply for naturalization after completion of five or more years in military service.

Public law 165, the Atomic Weapons Rewards act of 1955, approved July 15, 1955, authorized awards to persons furnishing original information to the United States concerning atomic weapons and nuclear material which has been introduced, manufactured or acquired in the United States contrary to law. Section 4 of the act provides that if such information leading to an award is furnished by an alien, the secretary of state, the attorney general and the director of central intelligence, acting jointly, may determine that the entry of such alien into the United States is in the public interest and, in that event, such alien and the members of his immediate family may receive immigrant visas and be admitted for permanent residence, notwithstanding the requirements of the Immigration and Nationality act.

Public law 319, approved Aug. 9, 1955, amended title v of the agricultural act of 1949, as amended. The new statute extends three and a half years, or until June 30, 1959, the authority for the recruitment and importation of Mexican agricultural workers. The act also provides for the relief of employers from liability to the United States for workers' transportation and subsistence costs when such costs have once been paid or pro-

vided to the workers by the employers. The amended act also requires consultation by the secretary of labour with agricultural employers and workers for the purpose of obtaining facts relevant to the supply of domestic farm workers and the wages paid such workers engaged in similar employment.

Public law 430, approved March 16, 1956, granted the benefits of section 301(a)(7) of the Immigration and Nationality act to certain children of United States citizens. It extends the provisions of that section to all cases involving children born to one alien parent and to one parent who is a citizen of the U.S. who served in the armed forces of the United States after Dec. 31, 1946, and before Dec. 24, 1952, if the child was born outside of the United States and its outlying possessions after Jan. 12, 1941, and before Dec. 24, 1952, and if the child's case does not come within the provisions of section 201(g) or (i) of the Nationality act of 1940.

(See also LAW.)

(J. M. SG.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Immigration* (1947).

Imports: see INTERNATIONAL TRADE; TARIFFS. See also under various countries.

Income, Distribution of: see WEALTH AND INCOME, DISTRIBUTION OF.

Income and Product, U.S. For the first three quarters of 1956, the U.S. national income was at an annual rate (seasonally adjusted) of \$338,500,000,000 and the gross national product amounted to an annual rate of \$408,500,000,000. Both of these comprehensive measures of the value of the nation's output were at record highs. They were 4½% above the totals for calendar year 1955. Following small declines from 1953 to 1954, national income and gross national product had registered increases of about 8% from 1954 to 1955.

(The annual rate data represent the average of estimates for the first three quarters which have been adjusted for seasonal influences and multiplied by four to facilitate comparison with previous annual totals.)

As measured by the gross national product adjusted to eliminate the effects of price changes, the physical volume of goods and services produced in the United States in the first nine months of 1956 was at a rate larger than in any other year. It was two-fifths higher than in 1946, the first full postwar year, and more than twice as large as in 1929. On a per capita basis (that is, after allowance for population increase over the period), real national output in 1956 was three-fifths greater than in 1929.

The flow of personal income, which had increased slightly in 1954 despite the dip in national output and then risen 6½% in 1955, showed a further expansion. In the Jan.—Sept. 1956 period, personal income aggregated \$322,500,000,000 on an annual rate basis, 5% above the 1955 calendar-year total of \$306,100,000,000.

Meaning of Income and Product Measures.—National income, as defined by the U.S. department of commerce, measures the nation's output of goods and services in terms of its factor cost—the aggregate earnings of labour and property which arise from current production. Earnings are measured in the forms in which they accrue to residents of the nation, before deduction of taxes on those earnings. As such, they consist of the compensation of employees, the profits of corporate and unincorporated business enterprises, net interest and rental income of persons.

Personal income is the current income received by persons from all sources, including transfers from government and business but excluding transfers among persons. It differs from national income by the inclusion of transfers (such as relief,

veterans' pensions and government interest disbursements) which are not in return for current productive services, and by the exclusion of earnings (social insurance contributions and undistributed corporate income) which are not actually received by persons in the current period.

Gross national product or expenditure measures the nation's output of goods and services in terms of market value. It is "gross" in the sense that no deduction is made for depreciation charges and other allowances for durable capital goods used up in the productive process. Other business products used up by business in the accounting period are excluded. Gross national product comprises the purchases of goods and services by consumers and government, gross private domestic investment (including the change in business inventories) and net foreign investment.

Broad Patterns of Change.—As measured by the gross national product, over-all economic activity rose to \$367,000,000,000 (annual rate) in the second quarter of 1953 and then declined to a level of about \$359,000,000,000 in the spring and summer of 1954. There followed an upturn and vigorous expansion which by the last quarter of 1955 had carried the national economy beyond the \$400,000,000,000 mark. The recorded annual rate of gross national product in that period amounted to \$402,000,000,000.

In 1956 the value of national output registered further increases, though generally smaller than those in the previous upsurge. The gross national product attained the annual rate of \$414,000,000,000 by the third quarter of the year, and early in the last quarter it was evident that the momentum of economic forces was still upward.

Rising prices were mainly responsible for the advance in gross national product from the fourth quarter of 1955 to the third quarter of 1956. In contrast, the substantial growth in the value of gross national product from the fall of 1954 through 1955 had reflected very largely an expansion in the real volume of goods and services. The over-all price level in that period had been relatively stable.

Apart from the automobile and housing components, the quarterly advances in gross national product during 1956 matched those which had occurred in the upsurge that followed the 1953-54 business recession. The broad areas of continuing rise in 1956 encompassed, in the main, business investment, consumer expenditures other than for automobiles, foreign trade and state and local government purchases.

Gross National Product.—Personal consumption expenditures, which account for about two-thirds of the gross national product, were of record dollar volume in 1956. Their annual rate for the first three quarters of the year, \$264,000,000,000, exceeded the 1955 total by \$10,000,000,000 or 4%. (See Table I.)

Because of reduced outlays for automobiles, consumer expenditures for durable goods in the first nine months of 1956 were at a rate \$2,000,000,000 below the 1955 total of \$35,700,000,000. On the other hand, expenditures for nondurable goods and for services advanced appreciably. Consumer spending for the great bulk of individual items comprising these broad and diversified categories was larger in the 1956 period.

Gross private domestic investment—comprising the change in business inventories and "fixed" investment in construction and producers' durable equipment—was at the record annual rate of \$64,300,000,000 in the first three quarters of 1956. This category of gross national product had declined moderately in 1954 and then expanded by one-fourth in 1955 to a total of \$60,600,000,000.

Outlays for producers' durable equipment and nonresidential construction mounted steeply in 1956. For the first nine months of the year they were at a combined annual rate of close to

Table I.—Gross National Product or Expenditure

(In 000,000,000s of dollars)*

Item	1956†	1955	1954	1953
Gross national product	408.5	390.9	360.7	363.3
Personal consumption expenditures	264.0	254.0	236.5	230.0
Durable goods	33.7	35.7	29.4	29.0
Nondurable goods	132.3	126.2	120.9	119.0
Services	98.0	92.1	86.3	81.0
Gross private domestic investment	64.3	60.6	48.0	50.0
New construction	33.3	32.7	27.9	25.0
Producers' durable equipment	27.8	23.7	22.4	24.0
Change in business inventories	3.2	4.2	—2.3	—2.0
Net foreign investment	1.0	—5.0	—	—
Government purchases of goods and services	79.1	76.8	76.5	84.0
Federal	46.6	46.7	48.9	59.0
State and local	32.6	30.1	27.6	24.0

*Detail will not necessarily add to totals because of rounding.

†Data cover first three quarters and represent averages of seasonally adjusted quarterly totals expressed at annual rates.

Source: U.S. Department of Commerce.

\$46,000,000,000, about \$6,000,000,000 above the 1955 total. These increased outlays for business plant and equipment contributed one of the largest expansions in the nation's productive capacity for a peacetime year. Both residential building and business inventory accumulation, on the other hand, were somewhat lower in the first three quarters of 1956 as compared with the full year 1955.

Government expenditures for goods and services in the first three quarters of 1956 were at an annual rate of \$79,100,000,000, almost \$2,500,000,000 above the total for 1955. With purchases by the federal government stable at approximately \$46,600,000,000, this increase was concentrated in the state and local segment. Continuing a steady postwar uptrend, purchases by state and local governments advanced from \$30,100,000,000 in 1955 to \$32,600,000,000 (annual rate) in the first three quarters of 1956.

Expenditures for purposes of national security comprised nine-tenths of total federal government purchases in 1956. Such expenditures reached a postwar peak rate of \$53,300,000,000 in the second quarter of 1953, dropped by one-fourth over the next year and a half and changed relatively little throughout 1955 and the first three quarters of 1956. At an annual rate of about \$42,000,000,000, national security outlays in the third quarter of 1956 absorbed 10% of the total gross national product, as compared with 14½% in the second quarter of 1953 and 6% in the second quarter of 1950, just prior to the attack on South Korea.

National Income.—Nearly all industrial divisions of the economy contributed to the expansion of national income from 1953 to the first three quarters of 1956. (See Table II.) The only exception was agriculture, where income in the 1956 period, at a rate of about \$16,000,000,000, was virtually unchanged from the previous year. This stability, however, checked a four-year decline from the 1951 farm income total of \$20,000,000,000.

After having paced the sharp economic expansion during 1955, income originating in manufacturing levelled off in 1956. Income in this industry, which comprises almost a third of national income, was at an annual rate of \$105,000,000,000 in the first

Table II.—National Income by Industrial Origin

(In 000,000,000s of dollars)*

Industry	1956†	1955	1954	1953
All industries, total	338.7	324.0	298.3	302.0
Agriculture, forestry and fisheries	15.9	16.0	16.7	17.0
Mining	6.2	5.6	5.0	5.0
Contract construction	18.2	16.6	15.5	15.0
Manufacturing	104.9	101.8	89.6	96.0
Wholesale and retail trade	57.0	55.0	50.8	50.0
Finance, insurance and real estate	30.8	29.5	28.1	26.0
Transportation	17.0	15.9	14.6	15.0
Communications and public utilities	12.2	11.5	10.7	10.0
Services	34.6	32.5	29.8	28.0
Government and government enterprises	39.5	37.7	35.8	35.0
Rest of the world	2.2	2.0	1.8	1.0

*Detail will not necessarily add to totals because of rounding.

†Data cover first three quarters and represent averages of seasonally adjusted quarterly totals expressed at annual rates.

Source: U.S. Department of Commerce (except 1956).

three quarters of 1956—about the same as that which prevailed in the second half of 1955, although \$6,500,000,000 above the figure for Jan.-June 1955. In wholesale and retail trade and in farming, too, income in the first three quarters of 1956 was at a level differing little from that for the latter half of 1955.

With the stabilization of activity in these three sectors—manufacturing, trade and farming—the further uptrend of national income within the year 1956 was derived from a wide array of other industrial divisions. Principal among these were the services, government, finance, transportation and contract construction.

Most distributive shares of national income showed improvement in 1956. The main exception was corporate profits, which in the first three quarters of 1956 were at a level moderately below 1955. (See Table III.) Total corporate sales were higher in 1956, but costs rose somewhat more; in many industries, the

and net interest showed a further sizable advance.

Disposition of Personal Income.—Continuing the 1955 uptrend, personal income in the United States climbed to an annual rate of \$328,500,000,000 by Sept. 1956.

For the first nine months of 1956 the annual rate of personal income, as already noted, was \$322,500,000,000. Disposable income—personal income less personal taxes—was at a rate of \$284,400,000,000 as compared with \$270,600,000,000 in 1955. (See Table IV.)

Personal saving in the 1956 period amounted to an annual rate of \$20,400,000,000, considerably above the 1955 total of \$16,600,000,000. The rate of saving out of disposable income in 1956 was 7%.

(See also BUDGET, NATIONAL; BUSINESS REVIEW; CONSUMER CREDIT; DEBT, NATIONAL; PRICES; WEALTH AND INCOME, DISTRIBUTION OF.)
(C. F. Sz.)

Table III.—National Income by Distributive Shares

(In 000,000,000s of dollars)*

Item	1956†	1955	1954	1953
National income	338.7	324.0	298.3	302.1
Compensation of employees	236.9	223.2	206.9	208.1
Wages and salaries	223.0	210.4	195.5	197.3
Private	185.7	174.5	161.2	163.5
Government	37.4	35.9	34.3	33.8
Supplements to wages and salaries	13.8	12.8	11.4	10.8
Income of unincorporated enterprises and inventory valuation adjustment	40.3	39.0	38.4	39.2
Business and professional	28.9	27.3	25.9	25.9
Farm	11.5	11.7	12.5	13.3
Rental income of persons	9.7	10.1	10.5	10.2
Corporate profits and inventory valuation adjustment	40.0	40.9	32.9	36.0
Corporate profits before tax	42.2	42.7	33.2	37.0
Corporate profits tax liability	21.3	21.5	16.8	20.3
Corporate profits after tax	20.9	21.1	16.4	16.7
Inventory valuation adjustment	-2.3	-1.7	-3	-1.0
Net interest	11.7	10.8	9.7	8.7

*Detail will not necessarily add to totals because of rounding.

†Data cover first three quarters and represent averages of seasonally adjusted quarterly totals expressed at annual rates.

Source: U.S. Department of Commerce (except 1956).

ratio of profits to sales in 1956 was lower than in the previous year. This situation contrasted with that of 1955, when corporate profits rebounded strongly from the 1953-54 business recession.

Wages and salaries, the largest component of national income, had shown a less volatile movement than corporate profits from 1953 to 1955 and continued to advance during 1956. The total for the first three quarters of the year was at an annual rate of \$223,000,000,000 as compared with \$210,400,000,000 for the calendar year 1955. This rise, 6%, stemmed about equally from increased employment and higher wage rates, with the average work week in 1956 little changed from the previous year.

With reference to the other types of earnings comprising the national income, the net income of noncorporate business and professional enterprises rose 6% from 1955 through the first nine months of 1956; the net income of farm operators held about even; the net rental income received by persons declined slightly;

Table IV.—Personal Income and Disposition of Income

(In 000,000,000s of dollars)*

Item	1956†	1955	1954	1953
Personal income	322.5	306.1	287.3	286.0
Wage and salary disbursements	223.0	210.4	195.5	197.4
Other labour income	7.3	7.0	6.3	6.0
Proprietors' and rental income	50.1	49.1	48.9	49.3
Dividends	12.1	11.2	10.0	9.3
Personal interest income	17.2	16.1	14.9	13.7
Transfer payments	18.6	17.6	16.4	14.3
Personal contributions for social insurance	5.8	5.2	4.6	3.9
Personal tax and nontax payments	38.0	35.5	32.9	35.8
Federal	33.5	31.3	29.1	32.4
State and local	4.5	4.2	3.8	3.4
Disposable personal income	284.4	270.6	254.4	250.2
Personal consumption expenditures	264.0	254.0	236.5	230.5
Personal saving	20.4	16.6	17.9	19.7

*Detail will not necessarily add to totals because of rounding.

†Data cover first three quarters and represent averages of seasonally adjusted quarterly totals expressed at annual rates.

Source: U.S. Department of Commerce.

Income Tax: see TAXATION.

India. This republican member of the Commonwealth of Nations in southern Asia consists of a union of 14 states, with 6 centrally administered territories. Areas and populations (based mainly on the 1951 census) as of Nov. 1, 1956, are as shown in the table.

Language in India falls into two main groups: (1) Indo-Aryan or northern, including Western Hindi (spoken by 47% of the population), Bengali (8%), Marathi (7%) and Gujarati (5%); Western Hindi occurs as (a) literary Hindi, with Sanskritized vocabulary and the Devanagari script, used by educated Hindus, (b) Urdu, with Persianized vocabulary and the Perso-Arabic script, used by educated Moslems, and (c) the widely understood colloquial lingua franca (before partition generally called Hindustani), much used in commerce, the military services, etc., written in Perso-Arabic, Devanagari or Roman characters, and with many technical words of English origin. (2) Dravidian or southern, including Telugu (9%), Tamil (7.5%), Kannada (Kanarese) (4.4%) and Malayalam. English is used for all official purposes, but is to be replaced by 1965 by Hindi in the



COMMUNIST SYMPATHIZERS parading in India in 1956

Constituent States of India

State	Area (sq. mi.)	Population*	Capital (with pop., 1951)
Andhra Pradesh	110,250	32,200,000	Hyderabad (1,085,722)
Assam	84,924	9,000,000	Shillong (53,756)
Bihar	67,830*	38,930,000	Patna (283,479)
Bombay	188,240	47,800,000	Bombay (2,839,270†)
Jammu and Kashmir†	92,780	4,400,000	Srinagar (207,787§)
Kerala	14,980	13,600,000	Trivandrum (186,931)
Madhya Pradesh	171,200	26,100,000	Bhopal (102,333)
Madras	50,170	30,000,000	Madras (1,416,056)
Mysore	72,730	19,000,000	Bangalore (778,977)
Orissa	60,140	14,600,000	Cuttack (102,505)
Punjab	46,616	16,000,000	Chandigarh
Rajasthan	132,300	16,000,000	Jaipur (291,130)
Uttar Pradesh	113,410	63,200,000	Lucknow (496,861)
West Bengal	33,279*	26,160,000	Calcutta (4,578,071||)
Total	1,238,849	356,990,000*	
Centrally administered territories			
Andaman and Nicobar Islands	3,215	30,971	Port Blair (17,671)
Delhi	578	1,744,072	New Delhi (276,314¶)
Himachal Pradesh	10,451	983,367	Simla (46,150)
Laccadive and Amindive Islands	10	21,035	
Manipur	8,628	577,635	Imphal (133,601)
Tripura	4,032	639,029	Agartala (42,595)
Total	26,914	3,996,109	
Grand total	1,265,763	360,986,109§	

*Approximate figure. †Greater Bombay. ‡The inclusion of Jammu and Kashmir in India is disputed by Pakistan. §1941 census. ||Greater Calcutta, including Howrah, Tollyganj and other suburbs. ¶Union capital; total pop. of New Delhi and Old Delhi (1951) 1,191,104. §1955 est., 381,690,000.

Devanagari script. Religion: Hindu (about 85%), Moslem (10%), Christian (2%), Sikh (2%), Jain, Buddhist, Parsee, Jewish, etc.

Chief towns other than the union capital and provincial capitals (pop., 1951 census): Ahmedabad 788,333; Cawnpore 705,383; Poona 480,982; Nagpur 499,099; Howrah 433,630; Amritsar 325,747; Agra 375,665; Madura 361,781; Benares 355,777; Allahabad 332,295; Indore 310,859. President in 1956, Rajendra Prasad; prime minister, Jawaharlal Nehru.

History.—Foreign Affairs.—There was no improvement in relations with Portugal and Pakistan during 1956. The Portuguese government had complained in Dec. 1955 to the International Court of Justice that India had denied to Portugal rights of passage through Indian territory to the Portuguese enclaves of Daman, Dadra and Nagar Haveli. Acknowledging the notice received from the court, the government of India announced that it proposed to challenge the court's jurisdiction. On the frontier with Pakistan there were frequent incidents. Agreements in August regarding flood control in East Pakistan and in September regarding the allocation of the Indus waters on an *ad hoc* transitional basis were hopeful signs; but there was no change in the impasse over Kashmir. On Nov. 2 the Kashmiri constituent assembly passed the clause in the draft constitution incorporating the whole of Kashmir into India. The validity of this legislation was not recognized by Pakistan.

In January the United States agreed to supply 100,000 tons of steel for railroads and 6,000 tons of insecticide; in February a civil aviation agreement was concluded; and in March five agreements providing for technical co-operation to the value of \$26,000,000 were signed. In August the United States agreed to deliver agricultural surplus commodities, mainly wheat, worth \$305,900,000 and to pay \$54,200,000 toward shipping charges. Of this total outlay, \$54,000,000 would be a gift to India, \$72,000,000 would be spent by the U.S. government inside India for its own purposes and \$234,000,000 would be a loan to aid Indian economic development, the duration and rate of interest being settled later.

India played an active part in the negotiations following the nationalization of the Suez canal by Egypt. At the London conference (Aug. 16–23), convened to discuss the desirability of international control of the canal, V. K. Krishna Menon, India's delegate, opposed the majority view that control should be in the hands of an international body and led a small group of nations that favoured control of the canal by Egypt, aided by

an international body with advisory powers only. Throughout the crisis Nehru repeatedly stated that a peaceful settlement must be reached on the basis of the sovereignty and dignity of Egypt.

When Israel, France and Great Britain invaded the Sinai peninsula and the canal zone of Egypt the Indian government condemned their action as a flagrant violation of the UN charter. In the meeting of the UN general assembly on Nov. 2 India voted with the majority of nations urging an immediate cease-fire, and after the cease-fire accepted an invitation to send a contingent to join the UN police force. On Nov. 7 India voted with the Afro-Asian group which had sponsored a resolution in the general assembly calling for the immediate withdrawal from Egypt of all Israeli, French and British forces. This demand was renewed on Nov. 14 by the prime ministers of India, Indonesia, Burma and Ceylon at a meeting in Delhi. On Nov. 23 India with other nations of the Afro-Asian group sponsored a further resolution in the general assembly urging the assembly to note with grave concern that Britain, France and Israel had not yet withdrawn their forces and that they should be called upon to do so forthwith. Subsequently, India contributed a contingent to the UN police force in Egypt.

Home Affairs.—The major problem was the implementation of the report of the states reorganization commission. In January the government of India decided to accept all the recommendations except those regarding Bombay and Hyderabad. Instead of one bilingual Bombay state the government proposed to create Maharashtra and Gujarat, with Bombay city under central administration. This decision to separate Bombay city, where there was a Maratha majority, from Maharashtra state caused considerable dissatisfaction, and Sir Chintaman Deshmukh, the union finance minister, resigned in July. Thereafter the government revised its policy and favoured the incorporation of all the Marathi- and Gujarati-speaking areas into one large Bombay state.

As regards Hyderabad, it was decided to merge the Telugu districts, which the commission had wished to retain as a separate entity, in Andhra. On Nov. 1 India became a union of 14 states and 6 centrally administered areas. The office of *rajpramukh* was abolished, all the states being under governors.

Apart from the above-mentioned territorial changes the main effects of the reorganization were: Mysore state absorbed the whole Kannada-speaking area including the former state of Coorg, the greater part of four districts from Bombay state, three districts from Hyderabad and one district from Madras. Madhya Pradesh, having ceded eight predominantly Marathi-speaking districts to Bombay, absorbed the former states of Bhopal, Vindhya Pradesh and Madhya Bharat (excepting part of one district). The new state of Kerala (comprising the majority of Malayalam-speaking peoples) was formed from the former state of Travancore-Cochin with a small area taken from Madras. Patiala and the East Punjab States union were included in the Punjab; Kutch and Saurashtra in Bombay, and Ajmer in Rajasthan. Hyderabad state ceased to exist.

Planning and Production.—The first five-year plan was completed. It increased food grain production by 20%, and the index of industrial production (base 1951) was 130. The national income increased by 18%. In June power in the second powerhouse on the Nangal Hydel canal in Kotla was switched on; this marked the completion of the first stage of the Bhakra-Nangal project. In August a 1,000-kw. atomic reactor of the "swimming-pool" type, the first in Asia, began to function at Trombay.

The second five-year plan for the years 1956–61 was published and approved by parliament. It provided for a total expenditure of Rs. 72,000,000,000, of which Rs. 18,000,000,000 would be spent in the public sector of engineering and industry and

s. 9,000,000,000 in the private sector. Of the total outlay, 19% would be on mining and industry. Three steel plants were to be completed, lignite mining was to be developed and work was to begin on three fertilizer factories, an insecticide plant, a heavy electrical equipment project, heavy foundries and structural shops. The index of industrial production was expected to rise to 194 by 1961.

(See also PAKISTAN; TIBET.)

(S. GL.)

Education.—Schools (1952-53): primary 222,014, pupils 19,523,003, teachers 586,712; secondary 24,059, pupils 6,007,516, teachers 249,333; colleges to intermediate standard 158, pupils 284,594; vocational (including 151 schools of fine arts and 3,104 schools of oriental studies) 4,970, pupils 341,517, teachers 30,449. Adult education centres (1951-52) 43,333, pupils 1,066,437; teacher training 901, students 88,975. Universities (1955) 32. Other institutions of higher education (1952-53, including fine arts, oriental studies and physical training) 741. Total number of students (1954-55) 595,400.

Finance and Banking.—Monetary unit: rupee, with an exchange rate of Rs. 4.7 to the U.S. dollar. Budget (1955-56 est.): revenue Rs. 4,690,000,000, expenditure Rs. 4,990,000,000. Internal debt (March 1956) Rs. 1,003,300,000, external debt Rs. 1,294,400,000. Currency circulation (Dec. 1954) Rs. 12,190,000,000, (Dec. 1955) Rs. 13,850,000,000. Deposit money (Dec. 1954) Rs. 6,240,000,000, (Dec. 1955) Rs. 6,740,000,000. Gold and foreign exchange (Dec. 1954) \$1,885,000,000 U.S., (Dec. 1955) \$1,901,000,000 U.S.

Foreign Trade.—(1955) Imports Rs. 6,483,000,000; exports Rs. 6,055,000,000. Main sources of imports: U.K. 25%; other sterling area 22%; continental E.P.U. (European Payments union countries) 21%; U.S. and Canada 15%. Main destinations of exports: U.K. 27%; other sterling area 22%; U.S. and Canada 18%; continental E.P.U. 11%. Main exports: jute and bagging (1954) 22%; tea 20%.

Transport and Communications.—Roads (1953) 432,800 km. Motor vehicles (1954): passenger 168,200, commercial 136,300. Railways (1955) 5,300 km.; traffic (April 1953-54): passenger-km. 60,429,000,000, freight (1954-55) 50,016,000,000 ton-km. Shipping (July 1955): merchant vessels of 100 gross tons and over 221; total tonnage 569,718. Air transport (1954): passenger-km. 440,400,000; cargo 28,284,000 ton-km. Telephones (March 1955) 245,799. Radio receiving sets (1953) 680,000.

Agriculture.—Main crops (metric tons, 1955; 1954 in parentheses): wheat 8,676,000 (8,017,000); rice 39,446,000 (37,387,000); barley 2,311,000 (2,951,000); maize 2,559,000 (2,986,000); tea 300,400 (291,000); peanuts 3,865,000 (3,884,000); linseed 382,000 (388,000); cottonseed 1,326,000 (1,528,000); cotton, lint 659,000 (764,000); jute 751,000 (31,000); dry beans 1,189,000 (1,197,000); chick-peas 5,207,000 (4,320,000); sugar (raw value) 1,960,000 (1,814,000); rubber 22,800 (21,000); millet 5,327,000 (5,148,000); sorghum 7,051,000 (9,239,000); rapeseed 254,700 (260,000); rapeseed 845,000 (1,035,000); sesame 465,000 (598,000). Other production (metric tons, 1954; 1953 in parentheses): potatoes 1,790,000 (1,997,000); sweet potatoes and yams 1,272,000 (919,000); cassava 1,278,000 (1,255,000). Livestock (1951): cattle 155,099,000; sheep 38,829,000; pigs 4,420,000; buffaloes 43,351,000; goats 47,000; horses 1,514,000; asses 1,239,000.

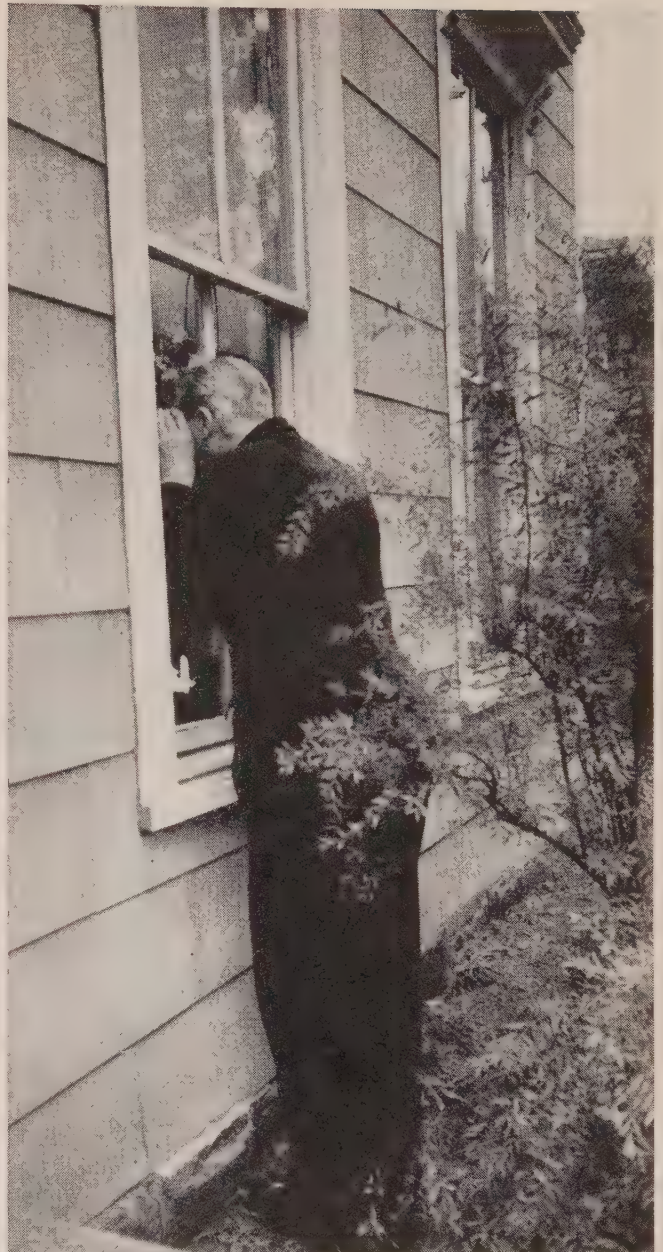
Industry.—Fuel and power (1955): coal 38,832,00 metric tons; electricity 8,472,000,000 kw.hr. Production (metric tons, 1955): iron ore 5% metal content 4,320,000; pig iron 1,920,000; crude steel 1,728,000; copper (refined) 7,440; lead (refined) 2,280; aluminum 7,320; cement 776,000; cotton yarn 745,200; woven cotton fabrics 4,680,000,000 m.; other manufactures (1954) 946,500 metric tons. Miscellaneous production (metric tons, 1954): sulphuric acid 153,300; caustic soda 29,800; gold 88 kg.; manganese ore (metal content, 1953) 897,000 metric tons; bicycles (units, 1954) 372,360.

ENCYCLOPEDIA BRITANNICA FILMS.—*Hindu Family* (1952); *India* (1955); *India* (Pakistan and the Union of India) (1952); *Mahatma Gandhi* (1955).

India, Portuguese: see PORTUGUESE OVERSEAS TERRITORIES.

Indiana. An east north central state of the United States, popular name "Hoosier state," Indiana was admitted to the union Dec. 11, 1816, as the 19th state. Total area of the state is 36,291 sq.mi., including 86 sq.mi. of inland lakes and rivers. Pop.: (1950 census) 3,934,244, (July 1, 1956, provisional) 4,413,000; 59.9% of the 1950 population was defined as urban. Capital and largest city: Indianapolis (pop. 1950) 427,173. Other large cities: Gary 133,911; Ft. Wayne 133,607; Evansville 83,636; South Bend 115,911; Hammond 87,594; Terre Haute 22,144; Muncie 58,479; East Chicago 54,263; Anderson 46,820. **History.**—Construction of a new toll road across northern Indiana, dedicated at South Bend, Sept. 17, 1956, marked the completion of a chain of connected toll highways extending from New York to the outskirts of Chicago. There was no session of the state legislature in 1956.

In the Nov. 6, 1956, election in Indiana, Pres. Dwight D. Eisenhower polled almost 400,000 more votes than his opponent, Elai E. Stevenson. Homer Capehart, Republican, was re-elected



INDIANA VISITOR, Harold Macmillan, British chancellor of the exchequer, peering into a window of the home in which his mother was born at Spencer, Ind. Macmillan was in the U.S. in 1956 to attend a meeting of the World Bank and visited Spencer at the invitation of the townspeople.

to the U.S. senate. As the result of the election, state officials for the term beginning in 1957 were: Harold W. Handley, governor; Crawford W. Parker, lieutenant governor; Frank A. Lenning, secretary of state; Edwin K. Steers, attorney general; Roy T. Combs, auditor; Adolph L. Fossler, treasurer; Wilbur Young, superintendent of public instruction.

Education.—The number of public schools in the state in 1956 was 2,368. Enrolment in the elementary schools was 633,140 with an estimated 25,355 teachers. Enrolment in the high schools (grades 9-12) was 202,603 with an estimated 6,982 teachers. Parochial schools had an enrolment of about 81,000. For the year 1955-56 the state appropriated \$76,818,200 for the support of schools, in addition to the sums provided by local units of government, which brought total school expenditures to an estimated \$255,000,000. About 77,500 students were enrolled in 35 Indiana colleges and universities in Sept. 1956.

Social Insurance and Assistance, Public Welfare and Related Programs.—In 1955-56 the state's welfare program cost \$39,966,341, of which \$19,433,588 was furnished by federal funds, \$9,562,785 by state funds and \$10,969,968 by county funds. Old-age assistance cost \$21,246,299, blind assistance \$1,313,964 and aid to dependent children \$9,353,297. In addition, child welfare cost \$2,866,581 from state and county funds, while hospital commitments cost \$1,122,699 from county funds. Receipts of the state for unemployment insurance for the year ending June 30, 1956, were \$36,779,191. Benefits paid out were \$28,158,567.

In 1956 the state maintained ten institutions for mental patients, in-

cluding an epileptic village; eight homes, hospitals and schools; and six penal and correctional institutions. As of June 30, 1956, inmates of mental institutions totalled 17,666 and of penal and correctional institutions 6,998.

Communications.—The total mileage of state highways in 1956 was 10,717, with county roads totalling an additional 76,371 mi. The state highway expenditure for roads amounted to \$63,235,795 during the fiscal year 1955-56. Steam railroad first-line trackage measured approximately 6,682 mi. There were 90 mi. of electric railways. The estimated number of telephones in the state on Jan. 1, 1955, was 1,450,000. There were 73 commercial airports, 34 municipal airports, 4 military airports, 77 personal landing fields, 2 seaplane bases and 1 helicopter landing area in the state as of Oct. 1, 1956.

Banking and Finance.—On June 30, 1956, there were 354 state banks and trust companies with 91 branches. On the same date the total resources of these banks were \$1,830,404,761. Deposits totalled \$1,688,996,074. Three were 123 national banks and 85 branches on Dec. 31, 1955. Their resources amounted to \$2,562,579,000 and deposits totalled \$2,368,508,000 as of April 10, 1956. State savings and loan companies numbered 154 and their assets were \$429,026,568 as of Dec. 31, 1955. The state's 74 federal savings and loan associations listed assets amounting to \$663,912,000 as of Dec. 31, 1955.

State expenditures for the fiscal year 1955-56 were \$179,456,649 general fund, \$165,369,542 dedicated funds, total \$344,826,191. Receipts were \$160,620,484 general fund, \$170,547,102 dedicated funds, \$331,167,586 total. At July 1, 1956, there was a balance in the state treasury of \$54,000,000. The state constitution prohibits any long-term borrowing and Indiana therefore has no state debt.

Table I.—Principal Crops of Indiana

	Indicated 1956	1955	Average, 1945-54
Corn, bu.	234,929,000	276,136,000	234,929,000
Wheat, bu.	35,220,000	34,394,000	35,555,000
Oats, bu.	52,038,000	63,852,000	48,645,000
Soybeans, bu.	54,300,000	43,838,000	34,809,000
Potatoes, cwt.	1,478,000	1,391,000	2,026,000
Barley, bu.	2,484,000	2,665,000	762,000
Hay, all, tons	2,605,000	2,772,000	2,573,000
Tobacco, lb.	12,410,000	11,388,000	13,529,000
Apples, bu.	1,650,000	850,000	1,372,000
Peaches, bu.	360,000	90,000	478,000

Source: U.S. Department of Agriculture.

Agriculture.—Cash receipts from farm marketing in 1955 totalled \$991,350,000 or about 3.4% of the national total.

Table II.—Principal Industries of Indiana

	All employees 1954	Salaries and wages 1954 (in 000)	Value added by manu- facture 1954 (in 000)	Value added by manu- facture 1953 (in 000)
Food and kindred products	48,652	\$187,181	\$396,553	\$361,483
Textile mill products	2,629	8,190	13,200	14,064
Apparel and related products	15,102	35,970	59,520	*
Lumber and wood products	10,814	35,879	60,848	74,551
Furniture and fixtures	22,169	77,305	118,702	*
Pulp, paper and products	9,456	37,703	67,250	70,907
Printing and publishing	18,040	76,107	125,844	*
Chemicals and allied products	26,719	133,290	338,286	335,662
Petroleum and coal products	15,325	79,537	169,805	208,400
Rubber products	14,957	63,987	106,245	104,218
Leather and leather products	2,156	5,718	10,762	11,878
Stone, clay and glass products	23,119	89,798	174,679	165,252
Primary metal industries	86,028	403,505	766,505	881,924
Fabricated metal products	42,337	182,190	305,081	338,127
Machinery (except electrical)	61,461	276,999	476,177	522,726
Electrical machinery	68,350	283,940	543,979	612,480
Transportation equipment	91,775	431,617	729,821	960,930
Instruments and related products	2,879	10,693	20,529	*
Miscellaneous manufactures	20,089	83,899	127,511	191,318

*Withheld because the estimate did not meet publication standards, either on the basis of the associated standard error of estimate or on the basis of a consistency review.

Source: U.S. Department of Commerce, 1954 Census of Manufactures, preliminary report.

Manufacturing.—Data on manufacturing and industry for 1954 (latest available in 1955) are shown in Table II. (G. N. Co.)

Table III.—Mineral Production of Indiana

Mineral	Quantity 1953	Value 1953	Quantity 1954*	Value 1954*
Total		\$169,781,000		\$165,369,000†
Clays	1,654,000	2,514,000	1,946,000	2,991,000
Coal	15,812,000	62,354,000	13,400,000	48,913,000
Coke†	8,887,000	159,967,000	8,200,000	144,962,000
Iron, pig†	8,372,000	412,683,000	7,486,000	375,497,000
Petroleum (bbl.)	12,823,000	37,570,000	11,204,000	33,160,000
Sand and gravel	11,203,000	9,501,000	14,405,000	11,879,000
Stone	9,213,000	22,297,000	11,182,000	27,460,000
Other minerals		35,545,000		42,511,000

*Preliminary. †Total has been adjusted to eliminate duplication in the value of clays and stone. ‡Values for processed materials are not included in the totals.

Source: U.S. Bureau of Mines.

Mineral Production.—Table III shows the tonnage and value of those mineral commodities produced in Indiana in 1953 and 1954, whose value was \$100,000 or more. The state was third among the states in output of phosphate rock; it produced large quantities of coke and consumed one-third of the national total of coke for its iron and steel works; it stood third in output of steel, fourth in production of fire clay, and ranked 19th in value of its minerals, with 1.18% of the U.S. total.

ENCYCLOPEDIA BRITANNICA FILMS.—*Indiana* (1955); *Middle States* 2nd ed. (1955).

Indians, American. The election year of 1956 saw a decided slackening of federal government efforts to shift to other jurisdictions its 167-year-old responsibility to American Indians. The earlier pell-mell rush toward termination of federal responsibility came almost to a dead halt in congress.

Many of the bills opposed by Indians which had been given serious consideration in previous congresses did not appear again. Missing were the so-called Competency bill, the bill to sell fractional heirship lands, the joint resolution to strike the Indian commerce clause from the constitution (the clause that originated federal responsibility for Indians) and the California Flathead, Seminole and Turtle Mountain termination bills.

The congress did pass termination laws for three Indian tribes—the Wyandottes, Peorias and Ottawas, all located in north eastern Oklahoma—but each of these tribes had asked for termination. They had no trust or allotted lands and had long ceased to have bureau of Indian affairs supervision.

Congress passed two bills of major importance to Indians generally. One, public law 959, authorized the appropriation of up to \$3,500,000 annually for a program of vocational training for adult Indians. Another, public law 767, extended the life of the Indian Claims commission for another five years without changing any of the basic provisions of the act.

Other bills affecting Indians generally were:

Public law 702, directing the secretary of the interior to conduct a study of Indian education in the United States.

Public law 450, authorizing Indians to obtain mortgage loans on their land, subject to the approval of the secretary of the interior. This law could result in improved credit opportunities for Indians.

Public law 857, authorizing the subsurface storage of oil or gas on restricted Indian land. This law would permit Indians in certain areas to obtain revenue by leasing land for subsurface storage, a purpose not previously authorized.

Public law 871, making it a federal offense to embezzle or steal from an Indian tribe. Hitherto the Indian bureau had justified its refusal to turn tribal funds over to tribal officials on the ground that they would go unpunished if they stole from the tribe. Embezzlement from an Indian tribe is a crime for Indians as well as non-Indians.

Public law 188, setting up a procedure which would enable the Yakima to solve the problem of fractional heirship tracts on their reservation. Many Indians favoured bills which would extend to all Indian reservations the principle of this Yakima bill.

Public law 348, extending the trust status of land owned by members of the Five Civilized tribes beyond the expiration date of April 26, 1956.

Public law 485, authorizing the construction of the upper Colorado river storage and power projects, including the Navajo dam.

Public law 592, authorizing the partition or sale of heirship interest in allotted land on the Tulalip reservation in Washington. It was expected that this law might result in the liquidation of this reservation. It was enacted with tribal consent.

Public Law 717, settling certain claims of the Uintah and White River Utes by restoring to them subsurface rights in certain lands formerly part of the Uintah reservation.

Public law 718, amending the Menominee Termination act by providing for the drawing up of a plan for the future control of tribal property which plan must contain provisions for the protection of the Menominee forest on a sustained yield basis.

Public law 736, conveying an interest in about 27,000 ac. of land to the Seminole tribe of Florida.

Public law 769, providing for the payment of removal compensation of \$3,500 to each of 125 Pine Ridge Sioux families who were displaced in 1942 by the creation of the Pine Ridge aerial gunnery range.

Public law 772, restoring undisposed ceded land on the Colville Indian reservation to the tribe.

Public law 926, placing about 77,500 ac. of public land in New Mexico in trust for the Pueblos of Zia and Jemez.

Public law 830, providing hospitalization for the mentally ill of Alaska (including Indians, Eskimos and Aleuts).

All the bills that were passed by the congress were intended to benefit the Indians *where they live*, on their reservations. In one way or another, the reservation problem had been at the centre of the controversy over Indian affairs for many years. It was at the centre of the attempt to integrate the Indian into the larger non-Indian way of life. While the drive to "emancipate" the Indians came largely to a standstill on the congressional front, the year's developments may be said to have revolved around policies shaped on the executive front. These concerned four main areas: education, land, relocation policies and public

health.

The most striking progress in the educational field was achieved on the Navajo reservation, where enrolment of children in school increased nearly 7% over the preceding year and reached a record of 25,287 students. This total included not only children enrolled in schools on the reservation but those in mission schools, public schools of the peripheral communities and federal boarding schools located throughout the western states.

Another significant step in education was the initiation of a pilot program of adult education in five tribal areas. Under the readjustment or "termination" laws enacted in 1954, members of tribes such as the Menominee of Wisconsin and the Klamath of Oregon were afforded an opportunity for adult education and vocational training to prepare them for the assumption of full citizenship responsibilities which would come with the ending of federal trusteeship. The new program, however, went beyond this and affected tribes not covered by such legislation. Its principal purpose was to provide English language skills for Indians who had enjoyed little or no formal schooling in their youth.

The development of reservation resources was pressed forward through continued extension of Indian irrigation projects, further expansion of soil and moisture conservation work and other similar activities. Sales of Indian timber were sharply stepped up in the calendar year 1955 and produced about a third more income to the Indian owners than in the preceding year. Combined Indian income from oil, gas and other minerals reached an all-time high of more than \$41,000,000.

In addition to this heightened activity in the resource field, the bureau of Indian affairs also took steps to increase the opportunities for industrial employment of Indians in the vicinity of reservations. A program to foster and encourage the establishment of manufacturing or processing plants in these areas was set up under the direction of an assistant to the commissioner, and numerous contacts were made with industrial firms throughout the country. By the end of the fiscal year, plants of this type were either established or definitely in process at Kingman, Ariz., near the Hualapai reservation; at Cherokee, N.C., near the Cherokee reservation; and at Gallup, N.M., near the Navajo reservation.

Meanwhile the bureau continued its voluntary relocation program of financial help and community adjustment service for the benefit of Indians seeking employment opportunities away from the reservations. The number of persons receiving such assistance increased to 5,316 as compared with 3,461 the preceding year. This included 1,051 family groups, 732 unattached men and 573 unattached women. For the fiscal year beginning July 1, 1956, funds available for relocation assistance were more than tripled to a level of approximately \$3,500,000, and plans were made for a substantial expansion in the range of community adjustment services and in the staff both on the reservations and in the city offices.

At the five tribal areas covered by "termination" or readjustment laws enacted in 1954—Menominee of Wisconsin, Klamath of Oregon, Uintah-Ouray of Utah and western Oregon, and the four Paiute bands of Utah—steady progress was made throughout the year in preparing for the "termination date" when the Indians would take over full responsibility for their own property without further federal trusteeship. In the case of the western Oregon and Paiute groups, this date was scheduled for the late summer of 1956, and preparations were well advanced at the end of the fiscal year.

At Klamath a contract was signed for a complete appraisal of the tribal property which was scheduled for completion in the spring of 1957. For both the Klamath and Menominee the termination was set for 1958. For the "mixed blood" people at Uintah-

Ouray it was scheduled for 1961.

(C. J. S. D.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Longhouse People* (1951); *The Modern Chippewa Indians* (1955); *Navajo Indians* (1939); *Painting With Sand: A Navajo Ceremony* (1950).

Indochina: see CAMBODIA; LAOS; VIETNAM.

Indonesia. Indonesia is an Asian republic consisting of three groups of islands: (1) Major Sunda Islands (Java, Sumatra, Borneo, Celebes); (2) Lesser Sunda Islands (Bali, Lombok, Sumba, Sumbawa, Flores, part of Timor); (3) Molucca archipelago (Halmaheira, Ceram, Ambon, etc.). Area: 575,893 sq.mi. Pop. (1955 est.): 81,900,000. Large indigenous groups on Java: Javanese 41,250,000, Sundanese 13,260,000, Madurese (including the inhabitants of the island of Madura) 6,580,000 and Jakartans 3,960,000; on Sumatra: Menangkabaus 3,050,000, Bataks 1,820,000; on the Lesser Sunda Islands: Balinese 1,720,000; on Celebes: Buginese 2,350,000. Nonindigenous groups: Chinese 3,000,000, Europeans (mainly Dutch) 60,000. Language: as well as the Indonesia official language (Bahasa Indonesia), an adaption of Malay, 25 major languages and about 250 dialects were spoken. Religion: Moslem (Shafi'i) about 90%; Christian 4.3%; Buddhist 3%; Hindu 2.2%. Chief towns (pop., 1951 est.): Jakarta or Djakarta (cap.) 2,800,000; Jogjakarta or Djokjakarta 1,800,000; Surabaya 715,000; Bandung 800,000; Semarang 311,000; Surakarta or Solo 266,000; Medan 260,000. President, Achmed Sukarno. Premiers in 1956: Burhanuddin Harahap and (from March 20) Ali Sastroamidjojo.

History.—The first general elections for the house of representatives were held on Sept. 29, 1955, and those for a constituent assembly on Dec. 15, 1955. Both chambers were elected by proportional representation and were composed of no fewer than 28 political parties. Out of 43,100,000 constituents about 35,000,000 recorded their votes, but only four parties received more than 6,000,000 votes. The strongest was the Nationalist Party of Indonesia which collected 8,434,653 votes. It was followed by the so-called Masjumi or Council of Indonesian Moslem organizations with 7,903,886 votes. Another, more conservative Moslem party, the Nahdlatul Ulama (Religious Teachers' party), received 6,955,141 votes. The Communist Party of Indonesia, led by Dipa Nusantara Aidit, claiming a membership of 500,000, secured 6,176,914 votes.

Two days after the publication of the composition of the house of representatives the government presided over by Burhanuddin Harahap (Masjumi) resigned and on March 20, 1956, Ali Sastroamidjojo (Nationalist) presented a new coalition cabinet based on nine parties, the most important being the Nationalists, the Masjumi and the Nahdlatul Ulama.

President Sukarno paid a state visit to the United States in May. He was afterward officially received in Rome, where he had an audience with the pope; at Bonn, Hamburg and western Berlin, Ger.; and at Zürich, Berne and Geneva, Switz. He returned to Jakarta on July 3. In August and September he made a two-weeks' tour of the Soviet Union, where in all his public utterances he was lavish in his endorsement of the professed Soviet desire of peace. Sukarno next visited Yugoslavia, Austria and Czechoslovakia and then spent a fortnight in China. Speaking in Canton on Oct. 14, he said that the imperialists and colonialists were trying to create discord among Asians, instigating one Asian nation to fight another.

The Indonesian-Dutch negotiations that had started at Geneva on Dec. 10, 1955, broke off on Feb. 11, 1956, because the Netherlands delegation refused to discuss the issue of "Irian Barat" (West Irian) and because no agreement could be found as to financial and economic settlements linked with the dissolution of the Indonesian-Netherlands union desired by the Indonesian government. On Feb. 15 and 21 the Indonesian government signified

to the Netherlands government its withdrawal from the union and the fact that it considered itself no longer bound by the union statute and the agreements attached to it. On Aug. 4 the Indonesian government announced its decision no longer to recognize or make any further payment of Indonesia's debt to the Netherlands "as imposed by the Round Table conference agreements of 1949."

According to official Indonesian sources, this debt amounted to 4,081,000,000 gulden.

At the beginning of August Sjafruddin Prawiranegara, governor of the Bank of Indonesia, said in his annual report that production was decreasing, that the budgets continued to show deficits and that inflation was a real danger. The budget deficit in 1955 amounted to 2,090,000,000 rupiah but that of 1956 would be about 2,800,000,000 rupiah. On Aug. 1 the International Monetary fund granted Indonesia a \$55,000,000 loan to strengthen the country's foreign exchange position. On Sept. 15 it was announced at Jakarta that the Soviet Union had granted Indonesia a loan of \$100,000,000 repayable over a period of ten years in deliveries of Indonesian goods, mostly raw materials.

A draft of a five-year development plan was submitted in August to the house of representatives for approval. It would cost 30,000,000,000 rupiah; i.e., about 6% of the national income during the planned period.

(See also NETHERLANDS.)

Education.—(1954) Schools: primary 32,223, pupils 6,285,432, teachers 109,864; secondary 2,737, pupils 404,981, teachers 21,986; vocational 925, pupils 101,205. Teacher-training colleges 540, students about 45,000. Universities (1955) 5, students 18,534.

Finance and Banking.—Monetary unit: rupiah, with an export exchange rate of 11.36 rupiah and principal import rates of 11.48, 17.21 and 22.95 rupiah to the U.S. dollar. Budget (1954 est.; 1956 est. in parentheses): revenue 8,163,000,000 rupiah (8,653,595,679 rupiah); expenditure 10,754,000,000 rupiah (10,653,595,679 rupiah). Internal debt (Dec. 1954) 5,027,000,000 rupiah; external debt 5,237,000,000 rupiah. Currency circulation: (Dec. 1954) 7,542,000,000 rupiah, (Dec. 1955) 8,820,000,000 rupiah. Deposit money: (Dec. 1954) 3,420,000,000 rupiah, (Dec. 1955) 3,960,000,000 rupiah. Gold and foreign exchange, central bank only (Dec. 1954) U.S. \$248,000,000, (Dec. 1955) U.S. \$307,000,000.

Foreign Trade.—(1955) Imports 6,888,000,000 rupiah; exports 10,620,000,000 rupiah. Main sources of imports: Japan 14%; Netherlands 12%; other continental E.P.U. (European Payments Union) countries 21%; U.K. 6%; other sterling area 21%; U.S. and Canada 16%. Main destinations of exports: Malaya and Singapore 23%; other sterling area 13%; Netherlands 16%; other continental E.P.U. 7%; U.S. and Canada 18%. Chief exports: rubber 46%; petroleum products 23%; tin 6%; coconut products 4%.

Transport and Communications.—Roads (1954) 75,000 km. Motor vehicles in use (Jan. 1954): passenger 58,393, commercial 40,821. Railways (1954): 6,681 km.; freight 900,000,000 ton-km. Shipping: merchant vessels of 100 gross tons and over (July 1955) 142; total tonnage 101,044. Air transport (1955): 239,376,000 passenger-km.; freight 7,944,000 ton-km. Telephones (Jan. 1955) 67,054. Radio receiving sets (Dec. 1953) 377,026.

Agriculture.—Main crops (metric tons, 1955; 1954 in parentheses): rice (Java and Madura) 6,900,000 (7,225,000); rubber 745,500 (750,900); sugar, raw value, 840,000 (718,000); tea 43,400 (35,300); copra (exports) 159,200 (201,600); soybeans 410,000 (400,000); coconut oil (est.) 470,000 (486,000); palm oil (est.) 170,000 (168,600). Other crops (metric tons, 1954; 1953 in parentheses): maize 2,738,600 (1,815,000); peanuts 355,000 (406,000); cassava 9,443,000 (8,953,000); sweet potatoes and yams 2,038,000 (2,176,000); coffee (exports) 37,200 (32,000). Livestock: (Sept. 1953) cattle 4,624,000; sheep 2,381,000; (Sept. 1954) horses 621,000; buffaloes 2,911,000; (Sept. 1952) pigs 1,100,000; goats 5,615,000. Fisheries (1954): sea and inland landings 628,000 metric tons.

Industry.—Production (metric tons, 1955): crude petroleum 11,796,000; coal 814,800; tin concentrates (metal content) 33,840; bauxite (1954) 166,000; electricity (1954) 812,000,000 kw.hr.

Industrial Health. The United States public health service contracted, in 1956, with three federal agencies for studies in air pollution. The national bureau of standards was to study analytical methods for determining common pollutants, and was to attempt to develop means of identifying various pollutant combinations. The bureau of mines was to study waste incineration, stack effluents and the exhaust of internal combustion engines. The weather bureau was to study dilution of atmospheric contaminants, and to investigate methods of predicting weather conditions that might aggravate air pollution.

The first Inter-American Conference on Occupational Medi-

cine and Toxicology was held in Miami, Fla., in Sept. 1956. A joint project of the University of Miami school of medicine and the University of Havana school of medicine, the conference discussed, among other subjects, "Establishment of a Medical Department in Industry," "Work and Fatigue" and "Occupational Heart Disease."

In March 1956, 22 members of the Industrial Medical association participated in the first Menninger Foundation Seminar for Industrial Physicians, held in Topeka, Kan. Entitled "Maintaining Emotional Health," the week-long seminar focused on the practical application of psychiatric knowledge and skills in industrial medicine, and was designed to help the industrial physician further his understanding of psychological motivation; improve his skills in assessing the emotional aspects of medical problems; familiarize himself with techniques of brief psychotherapy; enlarge his knowledge of psychiatric treatment methods, criteria for referral, and processes of rehabilitation; develop a systematic point of view with respect to emotional influences on the health of employees.

The Central Institute of the Deaf and the School of Aviation Medicine at Pensacola, Fla., started a joint study of the effects of high-intensity noise on aircraft carriers. The study focused on the exposure of flight-line maintenance men and carrier deck crews who operate in the immediate neighbourhood of the exhaust of a modern jet engine.

Possibly the most important industrial health publication of 1956 was the *Encyclopedia of Instrumentation for Industrial Hygiene*. The encyclopedia was the result of a three-year co-operative effort between the University of Michigan Institute of Industrial Health and the Occupational Health program of the United States public health service.

A meeting was held in Denver, Colo., in April 1956 to review preliminary findings and recommendations resulting from a five-year research project on radon and its daughter products in the uranium mines and mills of that state. The findings had shown no medical effects attributable to working in the uranium industry, but there was insufficient information on enough men exposed in uranium mines for a long enough time to draw any conclusions.

Medical examinations were to be repeated at three- to five-year intervals, with an annual census of and consistent follow-up of workers.

In March 1956 the New York state departments of labour and of health put into effect regulations to protect workers most likely to be exposed to radiation hazards. Described as the first comprehensive safety code in the field, the Industrial Code Rule no. 38 covered about 150,000 workers, and the Health Department Sanitary code protected personnel in hospitals, clinics, dental offices, etc. The codes were intended to cover most of the peacetime uses of radiation.

A broadscope study of the possible biological dangers of exposure to atomic radiation on both present and future generations was begun by the National Academy of Sciences in Washington, D.C. Aided by a \$250,000 grant from the Rockefeller foundation, the study was designed to clarify some of the biological issues and problems created by the use of atomic energy. Six panels were to carry out the study, one panel devoted to each of the following areas: genetic effects; short- and long-range pathological effects; disposal and dispersal of radioactive wastes; meteorological aspects; oceanographic aspects; and aspects related to food and agriculture. (F. A. CE.)

Canada.—During 1956, the occupational health division of the department of national health and welfare, in co-operation with provincial counterparts in Ontario, Quebec, Manitoba and British Columbia and health departments in the other six provinces, continued programs designed to assist in the development

of sound health practices in relation to industry and other occupations throughout Canada.

An important development of the year was related to the problem of atmospheric pollution. The department of national health and welfare assumed additional responsibilities in this field and appointed a consultant to assist in the development of the departmental atmospheric pollution program. There was a radical increase in requests for information and advice, particularly from health departments of the western provinces. Also, during the summer, a hospital study was carried out to determine whether fluctuations in air pollution levels exert any direct effect on the severity of symptoms of patients suffering from some form of chronic respiratory or cardiovascular disease.

In the field of radiation, the division's radiation services directed increased attention toward investigation of the implication to the general population of an increased radiation background from the use of diagnostic X-ray equipment and other radiation sources.

In occupational health nursing there was a trend toward increased use of the services of nursing consultants employed by the federal and certain provincial divisions. Recognition of the value of services of this type was evidenced in the fact that a number of larger companies in Canada were now employing nursing consultants on their health staffs. In addition, there was a concerted move toward national co-operation of occupational health nurses throughout the country.

Most large industries in Canada were now operating health services for their employees within their own organizations, and some smaller industries, through a co-operative scheme or direct "purchase" plan, were also providing similar services.

(See also ACCIDENTS; PUBLIC HEALTH ENGINEERING.)

(A. V. R.)

Industrial Production: see BUSINESS REVIEW.

Infantile Paralysis: see POLIOMYELITIS.

Infant Mortality. Among babies in the United States in their first year of life there were 26.3 deaths per 1,000 live births during the first eight months of 1956. This was slightly under the record low rate of 26.4 for the corresponding period of 1955. There were altogether 107,000 infant deaths during the entire year 1955, with a rate of 26.5 per 1,000 live births. This rate is almost one-quarter that of 109 recorded for 1915, the earliest year for which such data are available.

White infants in the United States have a much lower mortality than the nonwhite. According to the latest available data, which relate to 1954, deaths under one year of age per 1,000 live births were: white males, 27.0; nonwhite males, 47.1; white females, 20.6; and nonwhite females, 38.6. A number of other countries experienced a decline in infant mortality between 1955 and 1956, according to provisional data. Rates for the first half of each year showed that in England and Wales the reduction amounted to nearly 7%. For the first quarter, the reduction was about 3% in Australia; in New Zealand and in Sweden it was about 5%; in Northern Ireland, 8%; and in Scotland, 14%.

Infant mortality varies widely from one country to another, as evident in the accompanying table. In 1954 rates exceeding 100 per 1,000 live births were recorded in Costa Rica, Columbia, Chile, Peru, India and Yugoslavia. The rate for Chile, namely 125 per 1,000 live births, means that one in eight children born fail to survive to the first birthday. In contrast, infant mortality in Sweden in 1954 was only 19 per 1,000 live births; in New Zealand (Europeans), it was 20; the Netherlands rate was 21 and for Australia (excluding aborigines), 22.

The leading causes of death among infants in the United States

during 1955 were: immaturity (unqualified), 5.6 per 1,000 live births; postnatal asphyxia and atelectasis, 4.4; congenital malformations, 3.6; birth injuries, 2.9; influenza and pneumonia, including pneumonia of newborn, 2.7.

Infant Mortality per 1,000 Live Births in Selected Countries

Country	1955	1954	1953	Country	1955	1954	1953
North America				Portugal	90	86	96
United States	27	27	28	Spain	56	54	59
Canada	31	32	35	Sweden	17	19	19
Costa Rica	105	101	113	Switzerland	26	27	30
Dominican Republic	—	68	74	United Kingdom	26	26	28
Guatemala	—	88	103	Yugoslavia	113	102	116
Honduras	—	60	59				
Jamaica	—	66	64	Asia			
Mexico	—	80	95	Aden Colony	—	—	197
Panamá	53	53	54	Brunei	—	—	113
Puerto Rico	55	58	63	Ceylon	71	72	71
Salvador, El	74	82	83	Cyprus	—	52	47
Trinidad and Tobago	68	61	70	Formosa	34	30	34
				Hong Kong	66	72	74
South America				India	—	114	118
Argentina	—	62	63	Israel (Jewish pop.)	32	35	36
British Guiana	70	76	79	Japan	40	45	49
Chile	121	125	112	Malaya, Federation of	—	83	83
Columbia	—	103	111	Singapore	—	56	67
Peru	—	113	98				
Venezuela	69	68	68	Africa			
				Algeria (Europeans)	45	48	53
Europe				Mauritius	67	81	94
Austria	45	48	50	Réunion	—	—	109
Belgium	48	41	42	Southern Rhodesia (Europeans)	21	29	25
Denmark	25	27	27	Union of So. Africa (Europeans)	31	34	34
Finland	30	31	34				
France	38	41	42	Oceania			
Germany (West)	42	43	46	Australia	22	22	23
Hungary	60	61	71	New Zealand			
Ireland	37	38	39	Europeans	20	20	20
Italy	49	53	58	Maoris	63	61	73
Luxembourg	39	44	42	Hawaii	21	23	21
Netherlands	20	21	22				
Norway	—	21	22				

Source: United Nations, *Monthly Bulletin of Statistics* (Oct. 1956); *Population and Vital Statistics Reports* (July 1956); World Health Organization, *Epidemiological and Vital Statistics Reports*, vol. IX (1956); Canada, Dominion Bureau of Statistics, *Preliminary Annual Report of Vital Statistics* (1955).

There is a close association between the factors responsible for the death of babies soon after birth and during the later stages of pregnancy. Because of this, it is becoming common practice to group together stillbirths of 20 or more weeks of gestation and deaths within the first week of infancy. This is known as "perinatal mortality." In 1954, there were 137,462 such deaths in the United States, 67,353 of which were live-born children who died before they were one week old. (See also DEATH STATISTICS.)

(M. Sp.)

Inflation: see PRICES. See also under various countries.

Influenza: see RESPIRATORY DISEASES.

Inland Waterways: see CANALS AND INLAND WATERWAYS.

Insects and Insecticides: see AGRICULTURAL RESEARCH SERVICE; PUBLIC HEALTH ENGINEERING.

Instalment Buying and Selling: see BUSINESS REVIEW; CONSUMER CREDIT.

Insurance. Life Insurance.—At the beginning of 1956 approximately 103,000,000 persons in the United States owned \$372,000,000,000 of life insurance in legal reserve companies, an increase of more than 11% in one year and about 145% in ten years. This insurance was composed of \$216,000,000,000 ordinary, \$101,000,000,000 group, \$40,000,000,000 industrial and \$15,000,000,000 credit. The amount of credit insurance on the lives of debtors increased 44% over the previous year. It assures full payment of loans covered in the event of death, leaving survivors free of this indebtedness. About four-fifths of credit insurance was provided by group plans and the remainder by individual policies. At the beginning of 1956 about half of all instalment credit outstanding in the United States was covered by this type of life insurance. By the end of 1956 the total amount of life insurance in force was well over \$400,000,000,000. In Canada at the beginning of 1956 approximately 6,500,000 policyholders owned about \$26,600,000,000 of life insurance, made up of \$18,400,000,000 ordinary, \$6,400,000,000

group and \$1,800,000,000 industrial. Credit insurance accounted for about 10% of the Canadian group insurance.

Since 1954 the U.S. government had provided for its civilian employees group life insurance and group accidental means insurance for death or dismemberment. The amount of group life insurance provided by the program approximated \$10,000,000,000.

During 1955 legal reserve life insurance companies made benefit payments to United States families of \$5,383,000,000, which was more than double the total of 1945. Beneficiaries received \$2,241,000,000 of this in the form of death benefits, while living policyholders received \$3,142,000,000 as matured endowments, annuity payments, surrender values, policy dividends and the like. Benefit payments to Canadian families in 1955 amounted to \$337,000,000, of which \$124,000,000 represented payments to beneficiaries and \$213,000,000 payments to living policyholders.

United States veterans and servicemen held about \$43,000,000,000 of national service and United States government life insurance. There was also \$13,000,000,000 of life insurance in force in fraternal societies, assessment associations and savings banks. The survivor benefits provided by the Social Security act afforded death benefits to certain members of the families of persons covered by the law.

(See also VETERANS ADMINISTRATION, U.S.)

Assets of United States and Canadian life insurance companies continued to grow rapidly, reaching about \$93,500,000,000 for United States companies and about \$6,500,000,000 for Canadian companies as of July 31, 1956. United States companies had about 3% of their assets invested in Canada, while Canadian companies had about one-quarter of their assets invested in the United States.

Investments by United States life insurance companies in industrial and miscellaneous bonds of United States corporations rose to \$18,250,000,000 on July 31, 1956, and in addition about \$970,000,000 was held in foreign industrial bonds, chiefly Canadian. Likewise, investments in public utilities grew to a new high of \$13,800,000,000 in the United States, plus another \$450,000,000 in Canada. United States life companies had only recently begun to expand mortgage holdings in Canada. Their loans outstanding on United States properties amounted to \$31,300,000,000 on July 31, 1956, compared with about \$300,000,000 on Canadian properties. Although ownership of government securities had declined since World War II, the United States companies still held \$9,950,000,000 in the United States and nearly \$1,030,000,000 in Canada.

The net interest rate earned on total assets of the United States companies, after deducting investment expenses but before federal income tax, rose from 3.46% in 1954 to 3.51% in 1955. However, because company income taxes were higher in 1955, the rate earned by the companies after such taxes resulted in little actual change from the 3.24% rate earned in 1954.

(L. A. L.)

Property Insurance.—The year 1955 was a sharply competitive one in property insurance. Despite rate reductions in several important lines, over-all premium volume made a gain of about 5% in 1955, in contrast to a 2% gain in 1954. An estimated premium volume of \$10,500,000,000 for the entire industry was produced in 1955.

Higher expenses, coupled with higher loss ratios in a few lines of insurance, portended a less favourable year at the start, but the last quarter of the year showed some excellent experience. The result was a combined loss and expense ratio just slightly higher than the 93.6% combined ratio for 1954.

There was a small increase in premium volume for the first six months of 1956, but the underwriting results were disastrous. Taking a representative sample of companies writing a sub-

stantial portion of the total property insurance premiums, their loss ratio was 62.2%. This was a 7-point increase over the corresponding period in 1955 for the same group of companies. Even expenses displayed a slight increase, moving up 1 point to 36.7%. Thus the combined loss and expense ratio for this group of companies amounted to 98.9%. For the same period in 1955 the combined ratio for this sample of companies was 91.3%. Virtually every type of property insurance contributed to the bad showing.

Fire Insurance.—Straight fire insurance in 1955 reversed the declining premium trend of prior years. There was a small increase in premium volume of about 3%–5%. This increase, joined by a decrease in fire losses, presented the companies with a modest underwriting profit in 1955. All of this changed during the first half of 1956. Few companies showed any underwriting profit.

Extended coverage premiums continued to climb to new heights in 1955, the increase over 1954 approximating 10%. The estimated volume for stock companies alone in 1955 was \$470,000,000. As recently as 1945, the volume was less than \$100,000,000. The rapid growth of this form of protection reflected the inflation in property values, an increase in the number of properties insured and substantial rate increases.

From a loss standpoint, 1955 and the first half of 1956 showed an improvement in the extended coverage area over the hurricane, tornado and windstorm-ridden period of 1954.

The serious floods of 1955 led to widespread demands for flood and disaster insurance. Since this risk is catastrophic in character and therefore not susceptible to private underwriting techniques, congress passed a flood insurance bill providing indemnification against those hazards.

Marine Insurance.—The year 1955 produced a 5% increase in volume in the inland marine field. A total of \$344,000,000 in premiums was the new peak in this area of coverage. This increase occurred despite the diversion of considerable personal property insurance premiums to the new homeowners' policies. Losses increased primarily because of thefts of goods in transit, and wind and flood. Nevertheless, this type of coverage remained profitable.

Premium volume in ocean marine reached a new level of \$150,000,000. Competition had resulted in a lowering of rates and a broadening of coverage. The sinking of the "Andrea Doria" was expected to have a marked effect on the 1956 loss ratio.

Casualty Insurance.—The scourge of the property insurance business was automobile insurance. Premiums ran in excess of \$4,000,000,000 and represented 40% of the entire premium volume in property insurance. Premiums continued to increase, but loss ratios mounted at a faster rate. In this field there are three categories of coverage: automobile liability, automobile property damage and automobile physical damage. The first two categories protect the automobile owner and operator for personal injury and property damage to the person and property of third persons. The last division refers to protection for damage or loss to the owner's car itself. Automobile liability experience went into the red in 1955 and sank even deeper in loss in the first half of 1956. Automobile property damage was profitable in 1955 and somewhat less so in 1956. The physical damage area had been the saviour of the automobile insurance line for a number of years, but rate reductions had squeezed much of the profit margin out of this type of coverage.

Workmen's compensation premium volume had remained relatively static for the past three years, at about \$1,200,000,000. Rate reductions and benefit increases in 35 states had kept the profit margin at a low level. As of Dec. 31, 1955, 23 states had approved a program to reduce the cost of handling the small workmen's compensation risk. It provided for a three-year fixed

rate policy for risks with an annual premium of \$100 or less. This plan would affect about 60% of all workmen's compensation policies, but only 6% of the total compensation premiums.

Accident and sickness insurance showed steady growth in 1955 and 1956. There had been a 12% increase in the premium volume. It was estimated that three out of every five Americans, or approximately 64% of the U.S. population, had some form of voluntary health insurance against the hazards of accident and sickness.

Fidelity premium volume, which rose about 28% in 1954, fell off in 1955 because of the three-year premium cycle. The underwriting experience was favourable.

In the surety field, premiums were up nearly 10%, primarily because of record construction activities in the country. Loss ratios were higher because of lower rates and a higher failure rate among contractors.

(L. J. A.)

Hospital, Medical and Surgical Insurance.—In the United States, health insurance was not a campaign issue in the 1956 presidential election. Essentially, both parties supported federal assistance to private insurance organizations, designed to stimulate expansion of the scope of coverage. No legislation proposing national compulsory insurance received attention in Congress during the year. However, the administration's reinsurance proposals were again introduced and received mild attention by congressional committees. The conclusion persisted among private companies that the proposal would be of little practical effect.

Following the large increase in health insurance in 1955, the growth in the number of persons in the United States covered by voluntary health prepayment slackened off somewhat during 1956. By the end of the year more than 113,000,000 persons held some form of coverage against hospital expense, more than 88,000,000 had surgical protection and more than 65,000,000 had some regular medical expense protection. Rates of growth indicated that the latter two coverages were becoming more available, and it was expected that by 1960 all three forms would cover relatively equal numbers.

Coverages providing high levels of service benefits in any area of health need, termed "major medical" or "extended" programs, continued their popularity. It appeared that by the end of 1956 such coverage in the United States and Canada would have reached 10,000,000 persons. Usually superimposed on "basic" programs, such programs typically provided for \$5,000 or \$10,000 of unallocated expense, with the insured paying a portion of all costs. Frequently there was a "corridor" between basic and extended coverages, in which all costs were met by the insured. Some programs were being written without a "basic" coverage, without corridor and with relatively low first-dollar deductible provisions.

Legislation providing comprehensive hospital-medical-surgical benefits for dependents of members of the U.S. armed services went into effect on Dec. 7, 1956. Care was made available in civilian hospitals and by civilian doctors, at virtually full cost to the federal government, with administration provided by private carriers. Blue Cross became the hospital agent in two-thirds of the states, and insurance companies in the remaining third. Medical societies, operating almost entirely through Blue Shield, assumed responsibility for administration of medical-surgical benefits.

Both the nonprofit and commercial industries in the U.S. strengthened their national organizations during the year. The insurance companies formed the Health Insurance Association of America; Blue Cross reorganized its Blue Cross association to expand interplan operations.

Canada moved slowly toward a national hospital insurance program, with federal and provincial leaders seeking to work

out a program to satisfy diverse demands of the provinces. Provincial insurance hospital programs in British Columbia, Saskatchewan and Alberta continued to expand coverage.

(A. G. S.)

Great Britain.—The 1956 reports of British insurance offices showed a substantial increase in business transacted. An improved level of premiums reflected the financial and economic buoyancy of 1955, although the expected benefit in the nonlife sections was diminished by enhanced competition.

Ordinary life sums assured written in 1955 approximated £1,150,000,000 against £1,000,000,000 in 1954, an increase of 15% following an increase of 17% in 1954 over 1953. The aggregate new industrial sums assured written by eight leading companies, at £221,307,000, compared with £209,589,000 in 1954, the average sum assured per policy being £57.7 against £54 in 1954, £53.6 in 1953 and £48 in 1952.

The combined fire and accident premium revenue of 24 representative British offices was £475,714,000 in 1955, compared with £447,434,000 in 1954 and £428,943,000 in 1953. The combined trading surplus of these two departments fell from £22,090,000 in 1954 to £17,524,000 in 1955, the ratio of profit to premium income being 3.7% following 4.9% and 6% in the two preceding years.

Table I.—Fire, Accident and General Insurance in Great Britain

(in £000)					
Year	Premiums	Claims	Profit and loss credit	% of Premiums	
Fire					
1953	181,346	83,454	15,462	8.5	
1954	184,582	89,828	9,635	5.2	
1955	192,913	90,480	10,259	5.3	
Accident and General					
1953	247,597	137,653	10,224	4.1	
1954	262,852	146,449	12,455	4.7	
1955	282,801	162,252	7,265	2.6	

A slight upturn in both premium income and profit transfer was recorded in the marine account.

Table II.—Marine Insurance in Great Britain

(in £000)					
Year	Premiums	Profit and loss credit	Fund	% of Premiums	
1953	44,130	3,317	70,167	159.0	
1954	40,304	4,416	67,875	168.4	
1955	41,668	4,671	68,121	163.5	

The Finance act, 1956, considerably affected the year's activities. The relevant sections of the act granted some relief from income tax and surtax in respect of premiums paid by self-employed persons, controlling directors and nonpensionable employees to provide a deferred annuity on retirement, and a more favourable basis of tax assessment on ordinary purchased annuities, with tax levied only on the interest content of each annuity payment. Provision was made for payment of annuities to widows and for reasonable payment of premiums and interest on premature death, but it was enacted that there must be no surrender value to the annuity which must also be noncommutable and nonassignable. Despite these limitations the life offices devised plans giving full effect to the concessions.

Whole-life, endowment and short-term life assurance business was maintained at a high production level. Much business was placed under the provisions of the Married Women's Property acts, and the "family income" type of policy assuring income for dependents, again in demand.

India's biggest nationalization measure, the government-owned Insurance corporation, was completed, taking over all life assurance business, 11 of the 17 foreign companies being British.

Losses on the world-wide fire account continued heavy, and a slowing down of economic activity combined with increased competition added to the underwriting problems of insurers. Inflationary pressure was mostly of the "slow" variety and made

little impact on the premium revenue. The deteriorating situation in the middle east revived demands for riot coverage, and this became increasingly difficult and costly to obtain as the year proceeded.

Motor vehicle insurance presented accident underwriters with a major problem both in the United Kingdom and overseas. Although rating adjustments alleviated the unfavourable trend somewhat, the increase in accidents and cost of repairs weighed heavily upon an otherwise profitable accident account.

The sinking of the Italian luxury liner "Andrea Doria" off the United States coast, involved British marine underwriters in the heaviest total loss ever experienced, and a payment exceeding £4,000,000. The insured amount was placed with underwriters in Italy, but 65% of the value was reinsured in London in approximately equal proportions with Lloyd's and company markets. By the Joint Hull agreement a degree of rating stability was maintained in the hull market, where the main problem again was delayed hull repairs and rising costs. In the cargo market, where capacity greatly exceeded business, competition led to a reduction in rates and a tendency to extend coverage at no extra premium to embrace trading risks not normally insurable.

(See also CO-OPERATIVES; FIRES AND FIRE LOSSES; SOCIAL SECURITY.) (P. Ss.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Casualty Insurance* (1954); *Insurance Against Fire Losses* (1952).

Insurance, Old Age: see SOCIAL SECURITY.

Inter-American Conferences: see ORGANIZATION OF AMERICAN STATES; PANAMÁ.

Interior, U.S. Department of: see GOVERNMENT DEPARTMENTS AND BUREAUS, U.S.

Interior Decoration. The typical well-decorated American living room of 1956 featured pale-toned walls, deeper and more intense colours on upholstered pieces which were lower than formerly, and a striking area rug defining one particular furniture grouping.

There were no important innovations in interior decorating, but rather intensifications or modifications of existing trends.

Mahogany and walnut were about evenly matched as favourite woods, with cherry following; similar warm brown finishes were applied to all three. A new process made veneers more resistant to damage. The plastic wood-grain reproductions were more skillfully handled and found their way into better grades of furniture.

Upholstered pieces emphasized extremely slim, tight tailoring, made possible through the use of foam rubber and, for the first time, the less expensive flexible foam plastics. Many types of modern furniture and some traditional styles displayed a trend toward lower-height tables and seating pieces, exemplified by "conversation tables" intermediate in height between coffee and dining tables and large enough to accommodate four to six chairs.

Modern furniture had almost entirely departed from its rigid angularity. In general, such details as legs, stretchers and chair arms were most often gracefully but complexly shaped and curved; hardware was frequently an important design element; tables and case pieces showed considerable use of parquetry, brass insets and, more rarely, fairly elaborate marquetry. There was a revival of interest in stainless steel for table tops and as an accent material. Mosaic tile tables were popular, and some tables were topped with a new material, marble chips embedded in plastic, which gives the effect of terrazzo.

Turquoise, a bit more intense than the favourite aqua of recent years, was the outstanding colour in all fabric categories. The neutral earth tones continued high in favour. Deep, intense blues were popular, and there was increased use of various shades

of gold in both drapery and upholstery fabrics.

In printed fabrics the most popular patterns were geometrics, simple abstractions and oriental-inspired compositions of grasses and leaves, which could be used with modern or traditional furniture.

Synthetic fibres continued to be used, particularly in curtains and draperies, but the furor over "miracle fabrics" had largely died down, along with many of the claims made for them. A new technique for making an infinite variety of textured fabrics involved the use of polyethylene fibres with other yarns; the fabric is woven flat and later processed to shrink the polyethylene, which puckers the rest of the material into a texture pattern determined by the arrangement of the polyethylene fibres.

Textured wall coverings, grass cloth and simulated brick and stone that had been high in favour for several years, were apparently dying out. The most favoured patterns of 1956 were extremely light, open and airy, spaced wide apart and with infrequent repeats. Relatively a rare occurrence in the history of wallpaper, white and off-white grounds were at or close to the top in use, along with very light, soft pastels. This trend to pale walls held true in paint also, and represented a sharp reversal from the deep colours of only a few years before.

The revival of patterned-to-size rugs was perhaps the outstanding development in floor coverings. Allover figured rugs and carpeting had dominated the field for so many years that rugs with borders and central design seemed quite fresh once more. In some cases patterns were done in colours, but rather more frequently a geometric border or central figure was achieved through various heights of pile. Carpeting generally emphasized colourful random tweedy effects with a trend toward lighter, brighter colours. There were many representational patterns suggesting such things as cobblestones or mosaics. Small area rugs emphasized contrasting stripes and figures and sometimes combined leather or other materials with wool. Nylon, a relatively inexpensive material, was widely used.

Copper highlighted the kitchen in 1956 with such items as copper-coloured ranges, canisters, breadboxes and wastebaskets.

Lamps and decorative accessories grew in scale while silvery metals increased in importance. Three-dimensional wall ornaments, candelabra, sconces, lavabos, bas-reliefs and planters were high in favour.

(See also FURNITURE INDUSTRY.)

(G. M. J.)

International Bank for Reconstruction and Development.

The International Bank for Reconstruction and Development (World bank) is an international co-operative financial institution owned and operated by its member nations. It makes loans for productive projects in member countries, either to governments or to private enterprises with government guarantee. The bank was established in July 1944 at the United Nations Monetary and Financial conference at Bretton Woods, N.H., and by 1956 had 60 member countries and subscribed capital of \$9,263,200,000. It had operated at a profit and built up reserves amounting to approximately \$240,000,000.

Lending Operations.—During the fiscal year ended June 30, 1956, World bank loans were maintained at a high level. The equivalent of \$396,000,000 was lent out in 26 loans to 20 different countries or territories. The year's lending followed the pattern of recent years and was mainly for improvement in basic services. Loans for electric power generation and distribution totalled \$175,000,000 and all together were contributing to an addition of more than 1,000,000 kw. of capacity in the borrowing countries. In the world as a whole, demand for power

International Bank, Member Countries, Oct. 1956

Afghanistan	Denmark	Indonesia	Panamá
Argentina	Dominican Republic	Iran	Paraguay
Australia	Ecuador	Iraq	Peru
Austria	Egypt	Israel	Philippines
Belgium	El Salvador	Italy	Sweden
Bolivia	Ethiopia	Japan	Syria
Brazil	Finland	Jordan	Thailand
Burma	France	Korea	Turkey
Canada	German Federal Republic	Lebanon	Union of South Africa
Ceylon	Greece	Luxembourg	United Kingdom
Chile	Guatemala	Mexico	United States
China	Haiti	Netherlands	Uruguay
Colombia	Honduras	Nicaragua	Venezuela
Costa Rica	Iceland	Norway	Vietnam
Cuba	India	Pakistan	Yugoslavia

had increased since World War II at an average of nearly 10% a year and this expansion, which reflected a rise in living standards as well as continued growth of economic activity, was expected to continue.

The largest loan ever made by the bank for a single project was that of \$80,000,000 for the Kariba project to develop the power potential of the Zambesi river in the Federation of Rhodesia and Nyasaland. Within the next 16 years, this project would bring about a more than threefold increase in power capacity in the federation. The facilities being built included the construction of a 500,000-kw. power plant at Kariba gorge, and nearly 1,000 mi. of transmission lines to bring the power to the copper belt in Northern Rhodesia and to industrial and other consumers in the principal cities of Southern Rhodesia. There was also a \$10,000,000 loan in Algeria for an expansion program that would add 135,000 kw. to present capacity and complete important links in Algeria's transmission network.

Two loans were made for power development in Europe. Norway received \$25,000,000 for the Tokke project, which would exploit the power potential of two of the country's rivers and several lakes. The 400,000-kw. plant being financed would serve the southeast, an area which consumed more than half the power produced in Norway. The Bank of Finland borrowed \$15,000,000 and was relending the funds to five public and private enterprises to increase electric generating capacity by 344,000 kw., and to complete a transmission system to bring power from plants in Lapland to the more populous and industrialized south of Finland.

Four power loans were made in Latin America. A loan of \$5,000,000 was expected to nearly triple the supply of power to the area of Quito, the capital of Ecuador; two loans totalling \$7,500,000 would increase supplies of power to Managua and 15 outlying towns in Nicaragua; and a \$5,500,000 loan in Uruguay would finance the expansion of a thermal power station in Montevideo. In Lebanon, \$27,000,000 was lent for the Litani river multipurpose project, which would relieve the country's acute power shortage, particularly in the Beirut area, and provide some irrigation along the coast.

The \$127,000,000 of loans for roads, railroads and ports during the 12-month period reflected the increasingly important place improvements in transport services had occupied in bank lending in recent years. Roads took the largest share during the year, with six loans totalling \$52,000,000 in Colombia, Guatemala, Haiti, Honduras, Panamá and Peru.

Other transport loans included \$25,200,000 to the Union of South Africa to continue an expansion program being carried out by the South African Railways and Harbours administration; \$2,000,000 to rehabilitate and improve the efficiency of Thailand's railways; and two loans totalling \$19,350,000 in Burma to reconstruct transport facilities badly damaged during World War II—one to improve railway services and the other to increase the capacity of the port of Rangoon. Other port loans were \$4,800,000 to reconstruct the East Wharves at Karachi, West Pakistan's only port; and \$3,200,000 to improve Corinto, Nicaragua's principal port on the Pacific.

Four loans totalling \$92,600,000 were made during the year, all in Asia, to develop industry. A \$75,000,000 loan to the Tata Iron & Steel Company, Ltd., in India was the largest industrial loan yet made by the bank. It was assisting an expansion program which would increase the capacity of the company by 60% and make possible the production of 1,500,000 tons of finished steel annually. Two loans totalling \$13,300,000 were made in Japan for the construction of a modern steel plate mill and a seamless tube mill, and for the modernization of an automotive plant and two shipbuilding companies. A loan of \$4,200,000 would help finance a pulp and paper mill at Chandraghona in East Pakistan. One loan was made for agricultural development during 1956 of \$1,500,000 to Nicaragua for the purchase of imported equipment and breeding cattle.

During the period July 1, 1956, to Oct. 15, 1956, the bank made five further loans, amounting to \$112,028,000. Two of these, totalling \$31,000,000, were for electric power development in Austria. The Cassa per il Mezzogiorno received \$74,628,000 for the agricultural and industrial development of southern Italy. A \$3,000,000 loan in Costa Rica was expected to help agricultural development, and \$3,400,000 was for dredging equipment for the port of Bangkok in Thailand.

By Oct. 15, 1956, the number of loans made since the bank started operations had risen to 155 in 44 countries and territories. The gross total of loan commitments stood at \$2,832,000,000.

Financial Operations.—Net earnings of the bank reached the record level of \$29,200,000 during the fiscal year 1956. Because of the general tightening of money markets, the bank raised its interest rates toward the end of the year. Of the capital subscribed to the bank in the domestic currencies of its members, the bank was able to lend or set aside for lending an additional \$129,000,000, or three times as much as in the previous year. A total of \$72,000,000 was raised by sales of parts of bank loans, and private banks participated in two-thirds of the loans made during the year. There was a slight reduction in the bank's funded debt which stood at the equivalent of \$850,000,000 on June 30. Two new issues of bonds amounting to the equivalent of \$22,000,000 were floated in the Netherlands and Switzerland; and \$23,000,000 of previous issues were retired. Disbursements amounted to \$284,000,000, of which borrowers spent approximately half in the United States and 40% in Europe. Borrowers met all payments of principal and interest during the year and loan repayments and prepayments amounted to \$48,000,000.

Advisory Services.—During the year the bank continued its advisory services to member countries, chiefly by means of advisory missions on particular aspects of development. The bank also continued to station resident representatives in several countries, and helped member countries to obtain specialists for economic development work.

The effectiveness of the bank's general survey missions, 14 in all, was becoming more apparent. Although total results could not be assessed, a number of specific accomplishments could be attributed in whole or in part to the work of the missions, such as highway programs in Colombia and Honduras, railway rehabilitation in Jamaica, the passage of income tax legislation in Nicaragua, changes in the education program in Malaya and the preparation of a five-year investment program in Guatemala. One of the most important results of the general survey missions was the influence they exerted in favour of a co-ordinated long-term approach to development problems.

The Economic Development institute, sponsored by the bank with the financial support of the Ford and Rockefeller foundations, held its first six months' course during the year. The purpose of the institute is to contribute to an improvement in

the quality of economic management in government. The first course was attended by 14 senior economic officials from 14 member countries or territories in Latin America, Asia, Africa and Europe. (See also BANKING; INTERNATIONAL MONETARY FUND.) (E. R. BL.)

International Children's Emergency Fund: see CHILD WELFARE.

International College of Surgeons: see SOCIETIES AND ASSOCIATIONS, U.S.

International Confederation of Free Trade Unions: see LABOUR UNIONS.

International Cooperation Administration: see FOREIGN AID PROGRAMS, U.S.

International Court of Justice: see INTERNATIONAL LAW; UNITED NATIONS.

International Finance Corporation: see UNITED NATIONS.

International Geophysical Year, 1957-58.

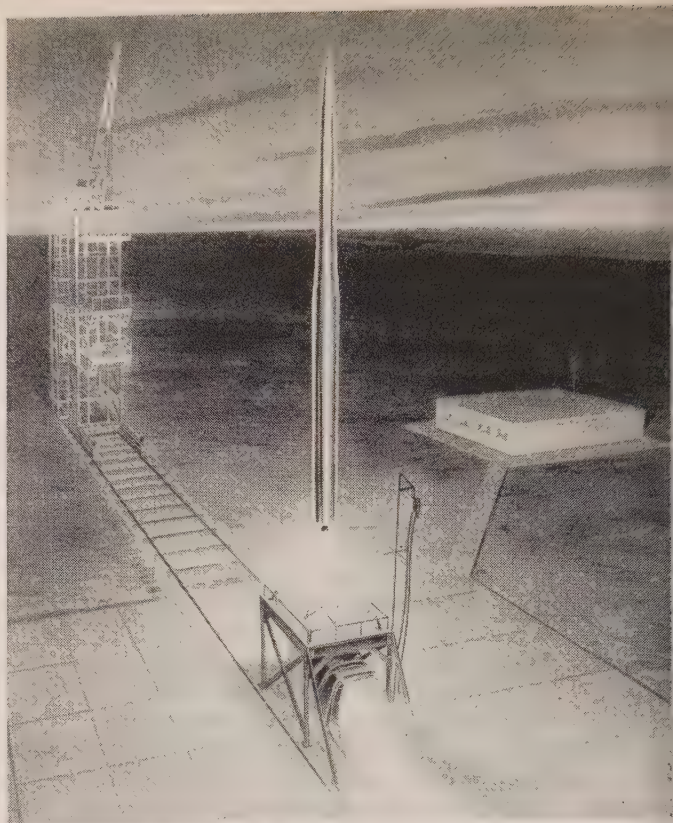
During the International Geophysical year, 1957-58, the world's scientists were scheduled to conduct the most comprehensive study of the earth ever undertaken. Intensive investigations throughout the world were to be carried out in meteorology, latitude and longitude determinations, geomagnetism, gravity measurements, ionospheric physics, aurora and air glow, solar activity, cosmic rays, glaciology, oceanography, seismology and through rocket and satellite explorations of the upper atmosphere. Fifty-five nations were participating in the program: Argentina, Australia, Austria, Belgium, Bolivia, Brazil, Bulgaria, Canada, Chile, Chinese People's Republic (Communist China), Colombia, Czechoslovakia, Denmark, Dominican Republic, Ecuador, Egypt, Ethiopia, Finland, France, German Democratic Republic, German Federal Republic, Greece, Hungary, Iceland, India, Indonesia, Iran, Ireland, Israel, Italy, Japan, Mexico, Morocco, Netherlands, New Zealand, Norway, Pakistan, Panamá, Peru, Philippines, Poland, Portugal, Rumania, Spain, Sweden, Switzerland, Tunisia, Union of South Africa, United Kingdom, United States, U.S.S.R., Uruguay, Venezuela, Vietnam and Yugoslavia. Each country would plan and execute its own program, under a general plan developed by the co-operating countries through a co-ordinating international committee.

The United States National Committee for the International Geophysical Year, established by the National Academy of Sciences, was in charge of planning, directing and executing the U.S. program. Federal sponsorship and support for the program was obtained by the committee through the National Science foundation, the government agency charged with responsibilities for federally supported basic research. Congress appropriated \$39,000,000 for the U.S. effort.

Because the sun dominates activities on the earth, continuous measurements were to be made of changes in solar radiations over the whole range of wave lengths or colours, not only visible light, but down to the invisible X-rays and up to the radio waves. Solar flares would be studied and correlated with changes in cosmic rays, ionospheric and auroral disturbances and meteorological phenomena.

Measurements of temperatures, pressures, humidities and winds during the period would provide information about weather patterns. Emphasis had been placed on high-altitude meteorological observations (up to 100,000 ft.) along four lines of stations (10° E., 75° W. and 110° and 140° E.) extending from the north pole to the south pole. These observations would be useful in studies of the movements of air masses around the world.

Problems having to do with the nature of oceanic currents,



ARTIST'S VERSION OF THE LAUNCHING of the space satellite planned as part of the contribution of the U.S. to the activities of the 1957-58 International Geophysical year. The satellite, housed within the nose of the rocket, is calculated to assume an elliptical orbit around the earth after the propulsion stages have driven it beyond the atmosphere of the earth

temperatures, composition, sea-level fluctuations and total water content would be studied by oceanographers. Emphasis would also be given to glacier studies, particularly in the arctic and antarctic.

The ionosphere, a region of rarefied ionized gas between 50 and 250 mi. above the surface of the earth, is a complex region of the atmosphere, fluctuating in height and depth and varying in ionization. It is affected by solar activity, geomagnetic disturbances, the aurora and perhaps by meteors. Predicting its effect on radio transmission is one of the major problems in ionospheric physics. Investigations planned by the U.S. involved the arctic, antarctic and equatorial Pacific regions as well as the Americas.

Both aurora and air glow, known to affect radio communications, are optical phenomena of the upper atmosphere and appear as light emitted by atoms and molecules of the atmosphere at about 37 mi. and higher. The aurora, which is the terminus of the path of ionized particles from the sun and the only visible portion of this path, enables theoretical geophysicists to learn a great deal about this stream of particles, its path through space, its capture in the equatorial ring and its subsequent bombardment of the atmosphere in the auroral zones about 23° from the magnetic poles. Spectroscopic, visual and photographic observations of the aurora would show its distribution. Radar would provide a record of the ionization associated with the aurora.

Geomagnetism has broad and basic implications in the study of the ionosphere, radio-wave propagation, aurora and cosmic rays, as well as other fields of science. U.S. scientists were to explore the physical mechanism causing geomagnetic storms which frequently cause strong aurora displays and radio black outs and also the ionospheric disturbances. The U.S. was to establish stations in Alaska, Antarctica and the equatorial Pacific

and an east-west chain of five stations stretching about 750 mi. across the western states, with a shorter north-south cross chain of three stations.

There are clear connections between cosmic rays and solar activity and the earth's magnetic field and magnetic storms. Cosmic rays represent a powerful tool with which to investigate magnetic phenomena many thousands of miles from the earth. Studies of cosmic rays require simultaneous measurements widely made over the earth, and parallel studies of solar activity, geomagnetism, aurora and ionospheric physics.

New techniques permit direct measurement of the upper atmosphere by means of large, ground-launched rockets with an altitude range of about 200 mi. Small rockets, launched from balloons and aircraft, were to be used during the International Geophysical year for measurements up to approximately 60 mi. U.S. rocket studies would be co-ordinated with those of other nations, particularly at crucial times of unusual solar activity. Rockets would measure atmospheric pressure, temperature and density; the earth's magnetic field, especially during auroral displays; night and day air glow; solar and ultra-violet lights and X-rays; auroral particles; ozone distribution; ionospheric charge densities; and cosmic radiation. More than 200 instrumented rockets were to be fired from stations in the United States, Canada, the Pacific and the Antarctic. A multimillion-dollar rocket-launching facility had already been constructed at Fort Churchill in co-operation with Canada.

Observations over a longer period of time would be possible when the U.S. launched satellites which would circle the earth in elliptical orbits at a distance of 350 to 1,500 mi., telemetering scientific data back to the earth. The satellites were expected to remain aloft many weeks, circling the earth approximately once every 90 minutes. Design and construction of the three-stage rocket which would place the satellite in orbit was well underway during 1956. Programs for optical and radio tracking and measurements of the satellite were initiated, and several experiments for inclusion within satellite vehicles were in design and instrumentation stages.

Seismic soundings were to be used for measurement of the depth of ice in Antarctica and mapping of the buried rock surfaces. Geophysicists would study the earth's deeper structure, locations of earthquake rifts or zones of instability in the antarctic continent and various types of microseisms and their relation to meteorological conditions. This work would be co-ordinated with that of an international network for study of the earth's crust and of the deep interior.

The United States planned activities in the arctic, subarctic, middle latitudes of the northern and southern hemispheres (including the United States, Central America, South America and adjacent parts of the Atlantic and Pacific oceans), equatorial Pacific and antarctic and subantarctic regions. In 1954-55 a preliminary reconnaissance of the Ross sea was made by the U.S.S. "Atka." In 1955-56 several icebreakers, cargo ships and tankers established the Little America station and an aircraft facility at McMurdo sound. Reconnaissance of the Knox Coast and of inland sites including the south pole and Marie Byrd Land were conducted by ship and aircraft preparatory to the establishment of interior stations, and during 1956-57 stations were established in the Weddell sea and at the Knox Coast by ship, at the south pole by aircraft and in Marie Byrd Land by tractor trains and aircraft. Scientific observations were begun at all six stations early in 1957.

(See also ANTARCTICA.)

(H. Od.)

International Labour Organization.

With record attendance of more than 800 delegates, advisers and observers, the 39th ses-

sion of the International Labour conference met in Geneva, Switz., June 6-28, 1956; 73 member countries and 9 territories were represented. Chief interest centred in discussion of the report of the director-general, David A. Morse (U.S.), on the rural-urban employment relationship in which 140 speakers participated, including 27 ministers of labour.

At the request of the governing body the conference devoted two days to an exchange of views on freedom of employers and workers from government control, on which the governing body was to act in Nov. 1956. The ensuing debate dealt chiefly with the advantages and disadvantages of the tripartite principle as opposed to universality in the I.L.O. organization.

The employers at the conference were dissatisfied with the decision to put employer delegates from socialistic and communistic countries on employer committees as deputy members without vote, regarding them as not independent of their governments.

The conference adopted two recommendations, one on vocational training in agriculture, and the other on welfare facilities for workers, applicable to manual and nonmanual workers but not in agriculture or sea transport. There was a first discussion on outlawing forced labour; a series of conclusions on the need for action for the protection and integration of indigenous populations in independent countries; and preliminary action on weekly rest in commerce and offices.

Other resolutions, some of which confirmed action already taken by the conference, urged members to ratify the Forced Labor convention of 1930, pending its revision, and to put the abolishment of forced labour on the agenda for a second discussion and final vote on a convention at the 1957 conference. Among the points to be considered in framing the convention was the U.S. substitute proposal to ban international commerce in goods produced by forced labour, which was to be considered as an alternative to the proposal to abolish it. The employers were on record in opposition to the convention as a regulation of the internal affairs of a state but they hoped that a suitable convention could be framed for a treaty with penalties to encourage compliance. The result of the discussions was inconclusive as to the final action. However, the conference voted to adopt conclusions with respect to forced labour in accordance with its committee's report and to reject the proposals of the Soviet government.

Resolutions were made to abolish wage discrimination based on sex, and to approve the report of the committee not to consider the application of international conventions to nonmetropolitan territories or other measures with the same intent. A resolution to reduce the hours of work was opposed by employers but finally adopted with the observation that technical scientific progress would justify its consideration, and the governing body was directed to consider placing it on the agenda of an early conference; also the director was asked to study existing differentials in wages where the principle of equal remuneration was recognized and where it was not. The conference also voted to put on the agenda of the 1957 conference a final decision on a convention on the protection and integration of indigenous populations in independent countries.

The budget voted for 1957 was \$7,617,708, compared with \$7,400,000 in 1956, but the ceiling imposed by the U.S. senate would have to be amended or the U.S. would remain in debt for part of its share.

The total number of ratifications at the close of the conference was 1,562, and included 4 ratifications of the Forced Labor convention, 1930, and 2 Honduras ratifications (the first received) of the important Freedom of Association (1948) and Right to Organize (1949) conventions.

The committee of experts had more than 3,700 documents to

examine, and found its task most difficult because of increased membership and expansion of its work. The total of 1,200 reports as compared with 800 the previous year indicated the change.

An over-all study of two conventions was made, and the experts concluded from a summary of conditions in 50 member states that the Right to Organize convention (1949) had all its provisions applied in 12 countries in addition to those that had ratified it, and the Equal Remuneration convention (1951) had been ratified, or was about to be, by 16 countries, and its flexible approach was established. The experts felt strongly that the office should give more technical assistance if members were to fulfil their constitutional duties.

(See also CHILD LABOUR.)

(S. McC. L.)

International Law. The year 1956, following ten years experience with the United Nations, some relaxation in the "cold war," and a rising belief in the possibility of prolonged co-existence of different types of states, witnessed a revival of optimism among the international jurists. Avoiding extreme positions, many jurists sought to formulate the actual influence of the changed conditions on the traditional corpus of international law. Among such efforts especial attention may be called to the articles by W. Friedmann on "Some Impacts of Social Organization on International Law"; by C. Wilfred Jenks on "Craftsmanship in International Law"; and by Majid Khadduri on "Islam and the Modern Law of Nations" (*American Journal of International Law* [A.J.], vol. 50, pp. 32, 358, 510 [Jan., April, July 1956]). These articles respectively throw light on the actual effect of the socialization of the economy in many states on rules of international law; on the influence of juristic thought, international practice, treaty drafting and judicial activity in accommodating traditional rules of international law to new conditions; and on the process by which the ideology of early Islam after many centuries accommodated itself to the need for co-existence with states of different ideologies.

Status.—A long deadlock on admission of new states to the United Nations was broken in the Security council meeting in Dec. 1955, when 16 states, most of which had been applicants for many years, were admitted by the general assembly. The list included Albania, Austria, Bulgaria, Cambodia, Ceylon, Finland, Hungary, Ireland, Italy, Jordan, Laos, Libya, Nepal, Portugal, Rumania and Spain. Japan and Outer Mongolia on the original list failed of admission because the Nationalist government of China cast a veto. In Feb. 1956 the Security council recommended the admission of Sudan and in July, Morocco and Tunisia. The admission of these five states would raise the number of members of the United Nations to 81. With that achievement, the only important states remaining outside the UN would be the divided states of Germany, Vietnam and Korea; Switzerland, which had not applied for membership because of its traditional policy of neutrality; and Communist China, whose large territory and vast population was still theoretically represented by the Nationalist Chinese government occupying the island of Formosa.

The territory of Southwest Africa remained theoretically under the mandate system, but the general assembly's committee declared in its report of 1956 that the South African administration after four decades "was still far from meeting in a reasonable way the standards implied" by that system. The International Court of Justice gave a third advisory opinion on this territory, maintaining the right of oral petition by the inhabitants of the area to the assembly's committee.

A Netherlands court held that Lithuania had been incorporated in the Soviet Union, that Soviet law applied even during the period of German occupation, and that the court was incompetent

to pass upon the methods by which this incorporation took place (*Lesser v. Rotterdamsche Bank, A.J.*, vol. 50, p. 441 [April 1956]). A Netherlands court also had held in 1954 that the Saar was not a part of Germany and a native of that territory could not benefit by provisions in the Netherlands-German treaty (*Mrs. W. v. T. S., A.J.*, vol. 50, p. 440 [April 1956]).

There was extensive juristic discussion of the status of Formosa. Opinions differed as to whether it remained juristically part of Japan, had become part of China, was a condominium of the states party to the Japanese peace treaty, or was an independent entity (D. P. O'Connell, "Status of Formosa and the Chinese Recognition Problem," *A.J.*, vol. 50, p. 405 [April 1956]). The status of Tibet under Chinese occupation also raised questions, although juristic opinion leaned to the view that it was part of China (Tieh-Tseng Li, "The Legal Position of Tibet," *A.J.*, vol. 50, p. 395 [April 1956]).

The vigorous claims of Argentina and Chile to portions of the Antarctic continent induced the United Kingdom to attempt to bring the issue before the International Court of Justice, and also led to considerable juristic discussion concerning the actual status of this area. The Soviet Union, along with many other states, had made claims on the basis of prior discovery to portions of this continent, and proposals were made for establishing a condominium or placing the area under the sovereignty of the United Nations (Robert D. Hayton, "The 'American' Antarctic"; Peter A. Toma, "Soviet Attitude Toward the Acquisition of Territorial Sovereignty in the Antarctic," *A.J.*, vol. 50, pp. 583, 611 [July 1956]).

The progress toward launching earth satellites and outer space missiles induced the International Civil Aviation organization to initiate discussion upon jurisdiction over such missiles and responsibility for damages which might result. The annual meeting of the American Society of International Law in April 1956 also devoted attention to the matter.

Rights of States.—The nationalization of the Suez Canal company by Egypt in July 1956 raised issues concerning the right of a state to expropriate, on payment of compensation, a corporation performing on its territory such public services of general international interest as were performed by the Universal Suez Canal company. The dispute also raised legal issues concerning the interpretation of the Suez Canal treaty of 1888 and the appropriate guarantees to assure free and open passage to vessels of all countries in accord with the obligations of Egypt under that treaty.

A number of cases concerning the right of expropriation under international law arose in national courts during the year. Thus a British court held, in accord with the well-known opinion in *Luther v. Sagor*, that, in general, a foreign law even though confiscatory must be recognized in so far as it affects property or contracts in the territory of the foreign state. It thus cast doubt on the case of *The Rose Mary* in which a judge of the colony of Aden refused to recognize title to oil which the defendant had purchased from Iran after that company had nationalized the Anglo-Iranian Oil company. The Aden court asserted that international law forbade expropriation without compensation and that it must apply international law. The British court, however, after citing that case, held that the German moratorium law of 1933 was a proper foreign exchange control act and consequently a German firm which complied with it and deposited with the German government its debt to a British company was properly discharged from the latter liability (*In re claim by Helber and Wagg*, 2 W.L.R. 183 [1956]).

Among other cases concerning the extraterritorial effect of laws was that of *Zwack v. Kraus Brothers & Co.* (133 Fed. supp. 929 [1955]) in which a United States court held that Hungarian confiscation of the partnership of plaintiff could not have ex-

extraterritorial effect upon property of the plaintiff in the United States. Another United States court held that criminal action under the antitrust laws against a United States corporation could be sustained, even though the acts creating liability were committed partly in foreign territory, because they affected the foreign commerce of the United States (*Sanib Corporation v. United Fruit Company*, 135 Fed. supp. 764 [1955]). A federal court held, however, that it could not order a Canadian corporation to stop using a trade-mark in Canada said to infringe the rights of a United States corporation to the trade-mark. The court stated that only Canadian law applied in Canada and that the international convention for protection of industrial property was not self-executing (*Vanity Fair Mills v. Eats Company*, 133 Fed. supp. 522 [1955]).

In *U.S. v. Baker* (136 Fed. supp. 546 [1955]) a United States court held that international law in general does not permit a state to exercise criminal jurisdiction over aliens for offenses committed abroad although it recognized some exceptions as when the crime was against the prosecuting state itself. Similarly, a British court held that it had no jurisdiction over acts of aliens committed abroad unless there were express statutory provisions to the contrary. In the case before it, prosecution was for violation of the dangerous drugs regulations by possessing opium in a British aircraft over foreign territory. A statute gave jurisdiction over offenses in British aircraft, but the court held that this would apply only to acts which were criminal *per se* because in violation of moral law, and would not apply to violations of regulations intended to be applicable only in British territory (*Rex v. Martin*, 2 All Eng. L.R. 86 [1956]).

A number of cases dealt with immunities of states and their agencies in foreign territory. A United States federal court held that property of the Republic of Korea in a New York bank was immune from attachment in an action arising out of damages by a Korean ship to the libellants' vessel. A note from the department of state was interpreted as supporting the immunity of all property of a recognized state, thus qualifying the department's memorandum in 1952 supporting the restrictive theory of immunity (*New York & Cuba Mail S.S. v. Republic of Korea*, 132 Fed. supp. 684 [1955]).

The high court of Calcutta held that Indonesia as a sovereign state was immune from jurisdiction and so was its property. But since that state's title to certain property in India was uncertain and it had submitted to the court to determine title, it had waived its immunity (*Indian National Steamship Company v. Maux Faulbaum*, A.J., vol. 50, p. 435 [April 1956]). United States courts have held that the initiation of a suit by the Republic of China did not have the effect of waiving the immunity of the Chinese ambassador from subpoena (*Pang Tsu Chow v. Republic of China*, 225 Fed. 2nd [1955]); that an attaché of the Belgium embassy was liable to taxation on his salary as vice-president of a United States corporation (*Van der Ekt v. Commissioner of Internal Revenue*, 223 Fed. 2nd 771 [1955]); and that a British consul had no immunity from subpoena except so far as provided in the British-United States treaty. This treaty extended immunity only to consular archives and official letters so did not prevent subpoena of the consul to determine whether the information wanted came within these exemptions (*Samad v. The Etivebank*, 134 Fed. supp. 529 [1955]). An Indian court held that rules of international law concerning sovereign immunities could not be applied if in conflict with the definite terms of an Indian statute (*Indrajitsinghji v. Rajendrasanghji*, A.J., vol. 50, p. 694 [July 1956]).

Treaties.—Denmark followed the Netherlands and other European countries in amending its constitution so as to increase the capacity of the government to make treaties, immediately

effective in national law and subordinating national sovereignty to international organs. This action accords with the resolution of the congress of the Inter-Parliamentary union in 1952 (A.J., vol. 50, p. 654 [July 1956]). A Philippine court held that the Romulo-Snyder executive agreement in 1948 for repayment of United States loans made during the war was valid. The authority to make executive agreements could be presumed from the Philippine constitution, and the court had to assume that the executive of the United States had similar powers. It could not properly inquire into the United States constitution (*U.S.A. F.F.E. Veterans Association, Inc. v. Treasurer of the Philippines*, A.J., vol. 50, p. 686 [July 1956]).

A California court held that the United States-Chinese treaty of 1946 was applicable to Manchuria even when that country was occupied by Communist forces, and that the provision concerning reciprocal inheritance rights was valid even though at the time a United States citizen could not have enjoyed this right under the circumstances. The court held that a treaty was with the state and applied to its entire territory irrespective of civil war and governmental changes. Consequently, a resident of Manchuria in 1949 was entitled to claim an inheritance in California, since the existence of the treaty established the reciprocity necessary for applicant to benefit by the California law (*In re Nepogodin's Estate*, 285 Pac. 2nd 672 [1955]). A federal court denied the claim of an Italian against extradition under the treaty of 1868. The court refused to admit that the treaty was terminated by the war of 1941 or that its revival in 1948 by executive action, in accordance with the peace treaty of 1947 without senate concurrence, was *ultra vires* (*Argento v. North*, 131 Fed. supp. 538 [1955]).

The problem of the rights which states may enjoy under treaties to which they are not parties arose in connection with treaties such as that between the United States and Great Britain concerning the Panama canal and that among eight European powers concerning the Suez canal, in each case extending the right of free navigation to all states. This issue was discussed at length by Jimenez De Arechaga ("Treaty Stipulations in Favor of Third States," A.J., vol. 50, p. 338 [April 1956]) with the conclusion that a liberal interpretation should be given to such treaties assuming that the right of the third party arises from the treaty itself and not from formal acceptance of it by that party.

Rights and Duties of Individuals.—The Human Rights commission of the United Nations in the spring of 1956 studied United States proposals concerning the advancement of respect for human rights and decided to request annual reports from members on progress in protecting human rights. A proposal was also made for a special study of the right to be free from arbitrary arrest, detention or exile. A proposal for extending advisory services of the secretariat to states in this field through technical assistance was also discussed but no action was taken.

The right of individual petition to the European Commission on Human Rights for redress of alleged violations of human rights was accepted by six states—the German Federal Republic, Denmark, Iceland, Ireland, Sweden and Norway. Belgium, Denmark, the German Federal Republic, Ireland and the Netherlands had accepted the jurisdiction of the European Court of Human Rights. This court, however, had not yet been established and could not be until eight states had accepted the jurisdiction.

The supreme court of Montana held the Montana Alien Land law barring land ownership by certain resident aliens unconstitutional as contrary to the equal protection clause of the 14th amendment (*State v. Oakland*, 287 Pac. 2nd 39 [1955]).

Status of International Organizations.—The council of the Organization of American States was held in fact and in law the successor to the governing board of the Pan American Union

(*Pan American Union v. American Security Trust Company, A.J.*, vol. 50, p. 438 [April 1956]). U.S. representatives to the United Nations general assembly were considered "officers of the United States" and consequently if the governor of Rhode Island accepted an appointment by the president to such office he could not remain governor (*Opinion to the Governor of Rhode Island*, 116 Atlantic 2nd 474).

War and Aggression.—A Pennsylvania court held that the term war as used in a statute should be interpreted in the popular sense to include the Korean hostilities of 1950 (*Morgan Estate*, 2 D. & C. 2d 480 [1954]). An Israeli court held that under the United Nations charter, members could not be in a state of war at least until the Security council had authorized sanctions. Furthermore if Israel had been at war with Lebanon, that war had been terminated by the armistice of March 1949, and the Israel government in protesting the Egyptian blockade in Suez had contended that there was no state of war. Consequently the contention that transactions of an Israeli with a Lebanese priest were invalid and contrary to the trading with the enemy act were not sustained (*Jiday v. Chief Executive Officer, A.J.*, vol. 50, p. 144 [Jan. 1956]). A United States court held that a German did not lose his enemy status by nominal naturalization in Liechtenstein, and consequently his property in the United States was liable under the trading with the enemy act. This opinion resembled that of the International Court of Justice in the *Nottebohm* case, holding that naturalization to be effective in international law must indicate a real connection (*Übersee Finanz-Korporation v. Brownell*, 133 Fed. supp. 615 [1955]).

The prescription of the use of force by the United Nations charter and the threat of hydrogen bomb war led to much juristic discussion concerning the present status of the law of war and aggression (Josef Kunz, "Laws of War"; Quincy Wright, "The Prevention of Aggression"; and Juraj Andrassy, "Uniting for Peace," *A.J.*, vol. 50, pp. 313, 514, 563 [April, July 1956]).

International Adjudication.—The International Court of Justice held itself without jurisdiction in cases brought by the United States against Czechoslovakia and the Soviet Union on account of aircraft incidents, and also in the cases brought by the United Kingdom against Argentina and Chile concerning claims of those countries in the Antarctic continent. In none of these cases had the defendant accepted the jurisdiction. The court had before it the claim of France against Norway concerning certain Norwegian loans; a request for an advisory opinion from the United Nations Educational, Scientific and Cultural organization (UNESCO) involving certain decisions of the administrative tribunal of the International Labour organization affecting UNESCO employees; and an application by Portugal against India concerning its right of passage through Indian territory to Goa. The court had given an advisory opinion sustaining the right of inhabitants of the mandated territory of Southwest Africa to petition the general assembly's committee orally.

Great Britain and the Union of South Africa renewed their acceptance of the optional clause of the court statute, the latter following the United States in reserving the right to determine what is a domestic question. Portugal also accepted the optional clause. Germany and Italy accepted the jurisdiction of the court for controversies with other parties to the Brussels treaty of 1948.

A United States court held that a decision of the Foreign Claims Settlement commission between the United States and Yugoslavia was final so an action to reopen a claim was denied (*De Vegvar v. Gilliland*, 228 Fed. 2nd 640 [1955]).

Codification.—At its seventh session in 1955 the International Law commission had reported its actions since 1949 on the regime of the high seas and had published provisional articles on freedom of the high seas for navigation, fishing, laying cables and flying. The draft dealt with the immunity of ships, collision,

salvage, slave trade, piracy, pursuit, pollution of waters, the limits of the territorial seas and innocent passage. Eighteen state submitted comments on this draft. The commission had also proposed a draft on the continental shelf.

Other topics under consideration in 1956 by the commission included the law of treaties, of consuls and of state responsibility. On the latter topic the Harvard Law school had renewed its research on international law and was preparing a draft on the responsibility of states for injury to aliens.

International Law Meetings.—The American Society of International Law celebrated its 50th anniversary at its annual meeting in April 1956. Regional meetings were held in 12 cities throughout the country. At the annual meeting appraisals of the present status of international law in the light of recent changes were made by Pres. Quincy Wright and the honorary president Secretary of State John Foster Dulles. Other topics discussed at the meeting included international air law, the regime of the seas, nationality and statelessness, and the constitutional and legal aspects of international relations.

Under the auspices of the American Society of International Law, an international investment law conference was held in February 1956 in Washington, D.C. Foreign tax problems, the effects of antitrust laws on international investments and legal incentive to investments were considered.

The Institute of International Law held its 47th meeting at Granada, Sp., in April 1956. Drafts were adopted on the interpretation of treaties, the exhaustion of local remedies, model clauses on obligatory jurisdiction of the International Court of Justice and the consequences of differences of nationality on marriage.

The Hague Academy of International Law held its 27th session in July and August 1956. Lectures were given on general principles, on the individual and international law, on protection of private property under international law, on recognition, on neutrality and on the protection of indigenous populations. Other lectures dealt with the history and the sociology of international law, and with the problem of the United Nations charter review.

The Inter-American Academy of International Law met in Havana, Cuba, in February and March 1956 and lectures were presented on international law and the United Nations charter and on various aspects of private international law.

(See also UNITED NATIONS.)

(Q. W.)

International Monetary Fund. The International Monetary fund came

into existence on Dec. 27, 1945, when its articles of agreement (formulated by the United Nations Monetary and Financial conference, Bretton Woods, N.H., in July 1944) were signed by 29 governments. After an inaugural meeting in March 1946 in Savannah, Ga., the fund officially began operations on May 6, 1946, at its seat in Washington, D.C. On Dec. 18, 1946, the fund announced agreement to the initial par values of 32 of its members and on March 1, 1947, announced its readiness to commence exchange transactions.

As of Sept. 30, 1956, there were 60 members with aggregate quotas of \$8,923,000,000.

International Monetary Fund, Member Countries, Sept. 30, 1956

Afghanistan	Denmark	Indonesia	Panamá
Argentina	Dominican Republic	Iran	Paraguay
Australia	Ecuador	Iraq	Peru
Austria	Egypt	Israel	Philippines
Belgium	El Salvador	Italy	Sweden
Bolivia	Ethiopia	Japan	Syria
Brazil	Finland	Jordan	Thailand
Burma	France	Korea	Turkey
Canada	German Federal Republic	Lebanon	Union of South Africa
Ceylon	Greece	Luxembourg	United Kingdom
Chile	Guatemala	Mexico	United States
China	Haiti	Netherlands	Uruguay
Colombia	Honduras	Nicaragua	Venezuela
Costa Rica	Iceland	Norway	Vietnam
Cuba	India	Pakistan	Yugoslavia

The board of governors approved the application of the republic of the Sudan which had until March 31, 1957, to complete membership formalities. An application was received from the Gold Coast. The executive board completed its quinquennial review of quotas required by the articles of agreement in Jan. 1956, and did not propose any general revision. However, increases in quotas were granted to the Dominican Republic, Ecuador and Nicaragua.

Assets of the fund as of Sept. 30, 1956, were \$8,909,436,772.92 including \$1,885,498,936.28 in gold, \$6,077,580,431.21 in national currencies (including \$1,697,720,493.42 in U.S. dollars) and \$941,421,140.50 in subscriptions receivable from member governments.

During the 12 months ended Sept. 30, 1956, six members purchased currency from the fund amounting to \$117,750,000 as follows: Burma purchased \$15,000,000; Egypt purchased the equivalent of U.S. \$15,000,000 in Canadian currency; Indonesia purchased \$55,000,000; Iran purchased \$26,250,000; Paraguay purchased \$1,500,000; and the Philippine republic purchased \$5,000,000. Since the beginning of operations in March 1947, total sales of currency by the fund, including Belgian francs, Canadian dollars, deutschemarks, pounds sterling and U.S. dollars, amounted to \$1,325,448,380.91.

During the same 12 months Burma, Ceylon, Finland, France, India, Indonesia, Iran, Japan and Turkey purchased amounts of their currencies with gold and dollars totalling \$253,069,936.91, bringing the total repurchases since the beginning of fund operations to \$984,880,970.71, of which \$199,613,472.08 was paid in gold and \$785,267,498.63 in U.S. dollars.

Stand-by arrangements with Belgium for \$50,000,000 and with Peru for \$12,500,000 continued in effect during the year. Mexico allowed its stand-by arrangement, which permitted drawings up to \$50,000,000, to expire on Oct. 15, 1955. A stand-by arrangement was agreed to by the fund to permit drawings by Chile up to \$35,000,000 over a period of one year from April 1, 1956.

There were 11 fund members (including the two newest members, Argentina and Vietnam) which had not established par values for their currencies in agreement with the fund. In addition, some members did not effectively maintain the par values agreed upon. The fund concurred in a proposal by the government of Paraguay for a change in the par value of the guarani from 1 to 60 guaranies per U.S. dollar in March 1956, at which time Paraguay carried out a simplification of its complex multiple rate system.

During the year three fund members, Thailand, Chile and Iran, effected substantial unifications of their exchange rates. Unification of the exchange system of Thailand was practically complete by the end of 1955. By Sept. 1956 all of Thailand's foreign exchange transactions were effected at the fluctuating free market rate. In April 1956 Chile carried out a considerable simplification of its multiple rate structure and abolished its import licensing system.

This was part of a general program intended to re-establish the stability of the Chilean economy. In Iran a uniform rate for buying and selling was established for all commercial and most noncommercial transactions.

Members availing themselves of the transitional arrangements under article xiv of the fund agreement, which provides for the possibility of applying payments restrictions without prior approval of the fund, are required to consult with the fund annually concerning the further retention of those restrictions. As of Sept. 30, 1956, 49 of the 60 members of the fund resorted to this transitional arrangement. Consultation with these countries enabled the fund to maintain direct and close contacts with members and provided an opportunity for discussion of the economic and financial problems which give rise to restrictive and discrim-

inatory practices and of the possibilities of further relaxation.

The *Seventh Annual Report on Exchange Restrictions* published in June 1956 reviewed the 1955 consultations, surveyed recent developments in the field of restrictions and outlined the restrictive systems of individual countries. In 1955, the movement toward greater freedom of trade and payments continued. This movement took place in a world payments situation which, in general, continued to show improvement. Very few countries intensified their restrictions and a large number found it possible to reduce them, the measures varying according to the system in force in the member country and its own particular situation.

The fund gave considerable attention to the so-called "Hague club" arrangement, by which Brazilian earnings from transactions with Austria, Belgium-Luxembourg, France, the Federal Republic of Germany, Italy, the Netherlands and the United Kingdom were pooled and the currencies of these countries made interchangeable, thus eliminating strict bilateralism. The participating countries hoped that certain other countries would make similar arrangements with Brazil. The fund welcomed the contribution made by these arrangements as a transitional step toward a fully multilateral and nondiscriminatory system of trade and payments. A somewhat similar arrangement, known as the "Paris club" and involving a slightly different group of countries, was also brought into operation for transactions with Argentina.

The fund continued to encourage the forward movement toward a fully multilateral system and to urge its members to diminish their use of restrictive and discriminatory practices, wherever their balance of payments, positions and prospects warranted such action. Moreover, the fund stood ready to make its resources available to members who needed help in establishing or maintaining the convertibility of their currencies or in overcoming temporary balance of payments difficulties. Barring unforeseen developments, the immediate future was expected to prove propitious for further progress in many countries in reducing, or eliminating, exchange restrictions.

The fund's general policies regarding the use of its resources remained unchanged during 1956. The revised schedule of charges which had been in effect from Jan. 1, 1954, and which expired on Dec. 31, 1955, was extended by the executive board until Dec. 31, 1956, and was being kept under review.

During the year, members of the fund staff visited 49 member countries for purposes of consultation, technical assistance or the exchange of views and information. The fund's training program had 17 participants in 1956 from 17 countries. The program, intended primarily to provide nationals of member countries with technical training related to activities with which the fund is especially concerned, also proved useful in disseminating a clearer understanding of the fund's purposes and procedures and made a valuable contribution to the general relations of the fund with its members.

On Oct. 3, 1956, Ivar Rooth (Sweden) retired after five years as chairman of the executive board and managing director. He was succeeded by Per Jacobsson, also of Sweden, who took office in Nov. 1956.

(See also INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT.) (F. A. Sd.)

International Red Cross: see RED CROSS.

International Trade. For the third successive year world trade in 1956 moved toward a new record level, as evidenced by data available through the first half of the year. From \$77,500,000,000 in 1954 and \$84,000,000,000 in 1955, exports for 1956 (at an annual rate based on January-June) were more than \$92,000,000,000. The previous high point had been \$76,500,000,000 in 1951. Generally booming economic

Table I.—World Trade, 1952-1956*
(In billions of dollars)

Area	1952	1953	1954	1955	1956	
					First quarter (annual rates)	Second quarter†
World exports, f.o.b., total	73.7	74.7	77.4	84.0	86.8	97.0
United States and Canada	20.0	20.4	19.5	20.3	21.3	25.0
Latin American republics	7.0	7.6	7.8	8.0	8.6	9.8
Continental western Europe‡	19.1	19.5	21.5	24.4	24.5	27.3
Related areas of western Europe . .	2.8	2.9	3.1	3.2	3.4	3.5
United Kingdom	7.6	7.5	7.8	8.5	9.1	9.6
British dependencies	3.6	3.2	3.4	3.8	4.2	4.2
Independent sterling countries . . .	7.4	7.7	7.7	8.2	8.2	8.7
Rest of world	6.2	5.9	6.6	7.6	7.5	8.7
World imports, c.i.f., total	80.1	76.5	79.4	88.1	92.4	100.0
United States and Canada	16.1	16.7	15.6	17.5	19.5	20.5
Latin American republics	7.6	6.6	7.3	7.3	7.2	7.2
Continental western Europe	21.8	21.3	23.7	27.1	28.2	31.7
Related areas of western Europe . .	4.3	4.0	4.2	4.3	4.2	4.4
United Kingdom	9.7	9.4	9.4	10.9	11.0	11.2
British dependencies	3.8	3.6	3.6	4.2	4.6	4.6
Independent sterling countries . . .	8.5	7.0	7.6	8.3	8.6	8.6
Rest of world	8.3	7.9	8.0	8.5	9.1	9.1

*Excluding U.S.S.R., European Soviet satellites and mainland (Communist) China.

†Partially estimated. ‡Excluding Finland, Spain and Yugoslavia. §Not available.

conditions in most of the major trading countries of the world were responsible for this continued growth in trade. Industrialized countries were requiring more and more imports to meet the expanding needs of consumers and industry. Payments by these countries tended in turn to stimulate their exports, as raw material producing countries were enabled to buy new goods which made possible increased living standards and expanded programs for capital development.

An analysis of the increased trade by areas showed that the industrialized countries over the last several years had been making a much greater contribution to the expansion of trade than the countries mainly producing foodstuffs and raw materials. This growth took place in spite of a movement of the terms of trade throughout the postwar period in the direction of the latter. As can be seen from Table I, 1956 appeared to be no exception to this trend.

Publication of indexes tends to lag behind that of trade data; indications were that the volume of trade (omitting changes in prices) was 5% greater in the first quarter of 1956 than in the comparable period of 1955. Prices of commodities moving in world trade had increased on the average by about 2% in the first quarter as compared with the like quarter of 1955. Data by regions showed more specifically that export prices of the United States, Canada, the United Kingdom and continental Europe in this period had risen by nearly 4%, while those of the rest of the world had declined somewhat.

In Jan. 1956 the fourth in a series of multilateral tariff negotiations under the General Agreement on Tariffs and Trade (GATT) was held in Geneva, Switz. This conference took place primarily as a result of legislation passed by the United States congress in 1955 which enabled the United States to negotiate with other countries concerning the further reduction (within specified limits) of United States tariffs. Twenty-two nations participated in these negotiations, which ended in May with a schedule of tariff concessions agreed on by the participants. These were to go into effect in the various countries on dates to be announced by each government. Those of the United States were required by U.S. legislation to be implemented in stages over a three-year period; the first stage became effective on June 30, 1956. (See also TARIFFS.)

United States.—During the first half of 1956 United States trade also registered record totals. Commercial exports, which were valued at \$8,343,000,000, surpassed all previous semiannual periods in quantity, except the first six months of 1947 when postwar requirements were at a peak. Imports, at \$6,330,000,000 in January-June, were greater than those in any earlier period, both in value and in volume. These record levels were brought about by the continued high levels of economic activity,

both in the United States and abroad.

The predominance of industrial goods in the growth of United States exports continued in 1956, as advances in producers' equipment and other capital goods became particularly marked in contrast to previous heavier gains in crude materials. Industrial goods accounted for more than half, or \$700,000,000, of the net over-all addition to commercial exports between the first six months of 1955 and the corresponding period of 1956. The remainder of the increase was divided between foodstuffs, which were up about one-third in value, and a miscellany of manufactured products. Among industrial goods of which export sales increased, construction, mining and other industrial machinery and trucks were prominent. Construction and mining machinery deliveries were more than 50% greater in value than those in the like period of 1955; other industrial machinery and trucks were 26% more. Sales of raw materials, mainly metals, fuels and chemicals, also continued to expand, but at a slower pace than in previous years. January-June shipments of coal showed a moderate rise beyond the extraordinarily high volume exported in the latter half of 1955. Metal exports, which slackened toward the end of 1955, renewed their upward movement as Canadian requirements for iron and steel and Japanese purchases of scrap and refined copper grew.

Agricultural exports increased markedly. In the first half of 1956 sales of wheat and flour were 46% higher in quantity and \$100,000,000 higher in total value than in the like period of 1955. A gain of about \$300,000,000 occurred in other foodstuffs. Coarse grains, oranges, dairy products, fats, oilseeds and tobacco were all exported in larger values than in the first half of 1955. Cotton sales, although recovering a part of the loss incurred in the second half of 1955, persisted at a low level, well under that of the first half of 1955.

Higher commodity prices contributed to the augmented export values. Unit values of manufactures were on the average 5% above the first half of 1955 and those of coal and semimanufactured materials were about 14% more. Prices of foodstuffs, on the other hand, were reduced by 3% or 4%.

Raw materials accounted for half of the net addition since the first six months of 1955 to the total value of imports for consumption, rising by \$380,000,000 or 13%, mainly because of higher prices. The volume of these imports advanced only about 5%. Prices of rubber, nonferrous metals, newsprint, iron ore and fuel oil averaged higher than in the first half of 1955. Those of

Table II.—United States Trade by Principal Areas and Countries

Country	(In millions of dollars)					
	General imports			General exports*		
	1955 Jan.-June	1955 July-Dec.	1956 Jan.-June	1955 Jan.-June	1955 July-Dec.	1956 Jan.-June
Total	5,507	5,875	6,339	7,657	7,884	9,114
Total, excluding military						
Exports				7,032	7,253	8,343
Imports	1,259	1,395	1,385	1,553	1,657	1,999
Canada	1,645	1,682	1,906	1,525	1,630	1,788
Latin American Republics	259	374	370	121	120	137
Brazil	190	252	222	165	167	181
Colombia	221	201	261	226	225	249
Cuba	228	168	224	328	374	411
Mexico	288	288	333	262	293	311
Venezuela	1,107	1,282	1,403	2,036	2,118	2,383
Western Europe	115	127	152	157	162	201
Belgium, Luxembourg	94	108	115	174	184	261
France	161	205	229	289	306	351
German Federal Republic	86	94	95	181	175	235
Italy	68	80	81	231	248	263
Netherlands	287	329	349	420	506	395
United Kingdom	320	299	317	312	277	373
Africa	54	34	66	9	10	10
British West Africa	53	43	54	145	115	144
Union of South Africa	883	898	983	1,001	999	1,135
Far east	120	101	107	95	93	116
India	188	244	263	311	335	374
Japan	113	122	116	18	18	25
Malaya	134	119	144	181	160	157
Philippines	259	281	305	229	173	243
Other areas						

*Country and area export totals exclude items in the "special category", i.e., commodities to which security restrictions apply regarding publication of detailed export statistics. Area totals exclude most countries to whom the United States shipped less than \$35,000,000 annually and those from whom U.S. received less than \$25,000,000 annually.

copper were up by 35% and of rubber, 20%. Much larger amounts of iron ore and crude petroleum were obtained from Canada and Latin America than in January-June 1955. Wool, newsprint, wood pulp and lead arrived in appreciably increased volume. Purchases of rubber, contrasting sharply with the sustained high level of demand in the United States for other raw materials, fell below those of 1955. There was a continued expansion in U.S. purchases of foreign manufactured goods, notably in machinery, aircraft, automobiles and structural steel products.

Compared with raw materials and manufactured goods, the value of foods imported rose only moderately, largely because of a fall in prices of coffee and cocoa. The quantities of foodstuffs imported were nevertheless at record peacetime levels. Purchases of coffee averaged 25% more in quantity but 10% less in unit value than in the first half of 1955, while 30% more cocoa was obtained for a smaller expenditure.

The distribution of United States exports between the various markets changed relatively little in January-June 1956 from that in the comparable period of 1955, as can be noted from Table II. The percentage of U.S. exports going to western Europe and Latin America, two of the largest markets of the United States, did not change, although the value of exports was much higher. Canada's share, however, rose from 23½% to 25% of the total. Nearly three-fifths of the increase in the export surplus of the United States in this period was concentrated in trade with Canada.

In the case of western Europe, foodstuffs, influenced by the U.S. surplus disposal programs, advanced by about one-third as compared with each half of 1955. Exports of industrial machinery also showed an important rise as did many industrial raw materials. Shipments to Canada of capital equipment rose unprecedentedly, and significant gains also occurred in exports of industrial equipment to Latin America. About 75% of the advance over the first half of 1955 was in that item.

U.S. imports from western Europe were valued at one-fourth more in the first half of 1956 than in the corresponding period of 1955. Nearly every European country contributed to this increase, which occurred especially in finished durable goods and industrial materials. Imports into the United States from all other areas except Africa rose in the first six months of 1956. There was also a 40% rise in imports from Japan between the two periods, concentrated primarily in cotton manufactures, glassware, cutlery, sewing machines and other manufactured goods.

During the year the second of the three major items in the Government's trade program was enacted into law by the Congress. On Aug. 2, Pres. Dwight D. Eisenhower signed the Customs Simplification act (H.R. 6040). In June 1955 the Trade Agreements Extension act had been passed, and it was under this that the United States was enabled to negotiate tariff reductions at the GATT meetings previously mentioned. Action on the third major trade proposal, U.S. participation in an Organization for Trade Cooperation, was delayed until 1957.

Canada.—Canadian foreign trade in the first half of 1956



CONTROVERSIAL SHIPMENT of U.S. tanks destined for Saudi Arabia being loaded aboard a freighter at Brooklyn, N.Y., in Feb. 1956

reached record peacetime levels for any six-months' period. Imports increased by 29% over the first half of 1955 to a value of Canadian \$2,845,000,000, while total export values at C\$2,304,000,000 rose 12% above the previous record of January-June 1955. These changes brought about the largest import balance in Canadian history, 60% above the previous half-year record in 1951.

As in the past, the United States continued to be Canada's leading supplier and primary market. Of Canada's exports, 60% went to the United States in January-June 1956 and 75% of its imports derived from there. Table III shows that forest products remained the largest group of goods exported to the United States; others of rising importance were nonferrous metals, iron ore and petroleum. Canadian imports from the United States rose sharply. While there were substantial advances throughout most commodity groups, by far the largest gain was in iron and steel imports (notably nonfarm machinery), rolling mill products, cars and trucks, tractors and pipe.

Canadian trade with the United Kingdom, second in importance to the U.S. as a trading partner, reversed itself completely in the first half of 1956 from the like period of 1955. In the 1955 period, strong British demands for grains, forest products and metals brought a 35% gain in Canadian exports, while imports

Table III.—Canadian Trade by Commodity Groups

Commodity groups	All countries		United States		United Kingdom	
	(In millions of Canadian dollars)					
	Jan.-June 1955	Jan.-June 1956	Jan.-June 1955	Jan.-June 1956	Jan.-June 1955	Jan.-June 1956
Exports of Canadian						
produce, total . . .	2,032	2,270	1,203	1,345	385	369
Agricultural products.	369	461	67	87	145	142
Animals and animal						
products	126	124	89	87	8	7
Wood, wood products						
and paper . . .	730	736	582	612	78	65
Iron and products . .	166	199	96	107	11	11
Nonferrous metals						
and products . .	396	431	212	238	122	122
Nonmetallic minerals						
and products . .	90	135	65	105	9	10
Chemicals and allied						
products	106	116	59	69	11	10
Other products . . .	49	68	33	40	1	2
Imports for consump-						
tion, total	2,209	2,845	1,649	2,117	183	239
Agricultural products	271	295	131	152	12	13
Fibres and textiles .	191	217	105	90	46	52
Iron and products .	774	1,168	695	1,030	54	82
Nonferrous metals						
and products . .	177	237	134	173	23	34
Nonmetallic minerals						
and products . .	286	344	148	179	13	17
Chemicals and prod.	121	148	106	130	10	11
Other products . . .	389	436	330	363	25	30

into Canada, delayed by strikes and reduced by lowered demand, dropped by 10%. In the first six months of 1956, Canadian exports to the United Kingdom, influenced by large inventories of Canadian goods accumulated in Britain during 1955, were curtailed by 4%. Imports from Britain, on the other hand, increased by more than 30% and were at their highest postwar level.

Canada's trade with Europe rose by 50% over the level of January-June 1955, with wheat accounting for almost 90% of the increased exports and manufactured goods of many types providing most of the increased imports. Exports to the other countries in the Commonwealth were at their highest level since the first half of 1952. Much of this increase was attributed to shipments of locomotives to India; there was also a substantial rise in the share taken by the Union of South Africa. Increases in imports from Latin America, especially cotton from Mexico, were much larger than increases in exports.

Latin America.—Available data on the trade of the first quarter of 1956 indicate a general rise in exports of the Latin American republics as a group when compared with 1955, and a maintenance of imports at approximately the levels of 1954 and 1955. Grouping the republics into "dollar" and "nondollar" countries, some divergent trends may be noted. The trade of the dollar countries, whose currencies and foreign economic positions were closely tied to the economy of the United States, appeared to be climbing, led by buoyant trends in Mexico, Venezuela and Cuba. The trade of the nondollar countries was being maintained at, or slightly below, the level of 1955.

The Central American countries, whose economies were aided by good markets for coffee, bananas, fibres and minerals, were showing an expansion in their exports in the early months of 1956. A plan for economic integration of this area was proceeding, as bilateral "free trade" treaties were put into effect between several of the five republics. In Jan. 1956, at the third meeting of the committee on Central American Economic Cooperation composed of the ministers of economy of the five republics, it was decided to draft a multilateral treaty for the purpose of establishing a free trade zone for certain commodities. A committee was authorized to study the problem of uniformity of tariffs for the republics as a necessary prerequisite to establishing a customs union.

In the strong Mexican economy imports were running at record levels in the first six months of 1956. Exports, also, for this period were at levels nearly 15% above the corresponding period of 1955, having been swelled by the early unloading of the remainder of the 1955-56 cotton crop. The ministry of economy announced at the end of July 1956 that imports of selected items (automobiles, trucks, pipe, machinery installations and a few others) would be permitted only in compensation for Mexican cotton exports. This was considered to be a temporary expedient in force until the new cotton crop was sold. Venezuelan exports continued to climb, as crude petroleum production reached another record high of 2,472,000 bbl. a day for the week ended July 2. The favourable economic position of Venezuela, based on large world demand for petroleum, enabled that country to remain one of the few nations without import controls. Cuban prosperity was attaining new heights in the first half of 1956, as sugar exports were 16% ahead of those in the corresponding period of 1955, and prices were relatively satisfactory. Outside of the United States market, which took 58% of the 1956 sugar shipments, the U.S.S.R. was Cuba's leading customer, with Japan a close second. Larger exports made possible increasing imports into Cuba in the first six months, and still allowed a rise in Cuba's official international reserves as of June 30, 1956, at 10% above the level of the year before.

Among the major nondollar countries, Brazil and Argentina were both undergoing continued economic difficulties, although

these were less severe than in previous years. The Brazilian balance of payments showed some improvement in the first half of 1956, largely as a result of high coffee exports at good, and slightly rising, prices. But imports were still limited by restrictions, first imposed early in 1954 in an effort to strengthen the country's international financial position. Total exports reached a value of \$719,000,000 in January-June 1956 compared with \$613,000,000 in January-June 1955, while imports declined to \$548,000,000 from \$662,000,000 in the first six months of 1955. There was therefore, a normal export balance on trade account for the first six months, unlike the first six months of 1955 when there was a sizable import balance.

Exporters in Argentina appeared in a much stronger position at the end of the first half of 1956 than for many years. An outstanding trade development in Argentina, a revision of the previous administration's policy, was the negotiation of a multilateral trade agreement with several countries of western Europe to replace the former separate bilateral agreements. The arrangement spread Argentina's commercial debt over a 10-year period and made it possible for Argentina to buy on the best price terms from any member of the western Europe trading group.

Western Europe.—Member countries of the Organization for European Economic Cooperation include Austria, Belgium-Luxembourg, Denmark, France, the German Federal Republic, Greece, Iceland, Ireland, Italy, the Netherlands, Norway, Portugal, Sweden, Switzerland, Turkey and the United Kingdom. The trade of the O.E.E.C. countries combined continued to rise in the first two quarters of 1956, but at a slower rate than during the exceptional year of 1955 (See Table IV). The value of O.E.E.C. exports and imports in the first quarter was at the highest level ever achieved, except in the last quarter of 1955. Trade between the O.E.E.C. countries, which had risen greatly during 1954 and the first six months of 1955, continued to decline slightly, while that with the dollar and other areas increased. The dollar trade gap lessened as exports from western Europe to the dollar area rose faster than imports from the area.

Several countries, including Germany, Norway and Sweden further liberalized imports from the dollar area during the early and middle parts of the year. The new dollar-free list published by the government of the German Federal Republic in June 1956 brought the total of private imports which could be purchased without license from the dollar area to more than 90%. As of July 1 imports into Norway from the dollar area were liberalized to about 80% of the total. Likewise, Sweden's liberalization of imports from the dollar area was further extended on July 1.

Multilateral payments systems were developed between major western European nations and two Latin American countries dur-

Table IV.—Trade of O.E.E.C. Countries, by Value and Volume

Country and Period	Exports f.o.b. (In monthly averages in millions of dollars)	Imports c.i.f.	Trade balance of dollars	Volume Index Exports 1953=100	Imports
O.E.E.C. countries combined					
Year 1955	2,776	3,228	-452	122	123
First quarter 1955	2,659	3,157	-498	119	121
First quarter 1956	2,833	3,324	-491	121	125
Belgium-Luxembourg					
Year 1955	231	236	- 5	127	122
First quarter 1955	225	230	- 5	121	117
First quarter 1956	255	253	+ 2	126	124
France					
Year 1955	404	394	+ 10	122	113
First quarter 1955	390	377	+ 13	126	111
First quarter 1956	364	426	- 62	110	120
German Federal Republic					
Year 1955	512	485	+ 27	142	153
First quarter 1955	469	437	+ 32	132	141
First quarter 1956	520	486	+ 34	141	150
Italy					
Year 1955	155	226	- 71	124	113
First quarter 1955	133	214	- 81	107	106
First quarter 1956	167	245	- 78	137	118
Netherlands					
Year 1955	224	267	- 43	124	140
First quarter 1955	211	261	- 50	116	137
First quarter 1956	223	284	- 61	124	147

late 1955 and 1956. The "Hague club" arrangement provided for the settling of trade accounts with Brazil by multilateral payments agreements. Members of this group included Austria, Belgium-Luxembourg, France, the German Federal Republic, Italy, the Netherlands and the United Kingdom. The arrangement provided that exchange proceeds from Brazilian exports to any one of the members of the club were to be pooled, and could be used to pay for imports from any other member of the group. A similar group called the "Paris club" came into force on July 2 between Argentina and a group of European countries, including Austria, Belgium, Luxembourg, Denmark, France, Netherlands, Norway, Sweden, Switzerland and the United Kingdom, and Italy joined later in the year.

The steady rise in the value of trade of the German Federal Republic was a key factor in western Europe's continuing prosperity. The value of German imports in the first half of 1956 reached 13,070,000,000 deutschemarks (DM) and exports were DM14,480,000,000. These figures compared with imports of DM11,400,000,000 and exports of DM12,100,000,000 in the first half of 1955, resulting in a rise in the export surplus to DM1,410,000,000 in January-June 1956 from DM700,000,000 in January-June 1955. Nearly three-quarters of the increase in imports between these two periods was in goods for industry, especially raw materials including coal, whose value rose by 19%. There was also a noticeable expansion in imports of certain manufactured goods such as machinery, rolling mill products, chemicals and ships. Exports of manufactured goods accounted for the major share of the increase in exports. All of Germany's principal exports expanded; especially large increases were registered in machinery, motor vehicles, electro-technical products, ships, chemicals and iron products.

With the O.E.E.C. area as a whole, German sales rose by 18% and purchases by about 6%. German exports to the Netherlands, the United Kingdom, Belgium-Luxembourg, France and Switzerland showed the most significant increases. The export surplus with this area, which takes more than 70% of German exports and provides 60% of its imports, rose in the first half of 1956 to almost double the amount for the corresponding half of 1955. Trade with the United States expanded in both directions. Purchases rose from DM1,600,000,000 to DM2,400,000,000 and sales from DM730,000,000 to DM965,000,000. During the latter part of June, the German government published a list of 600 additional items which could be imported from dollar countries free of all restrictions. This was the fourth such list issued since 1954 and, as noted earlier, brought the liberalization of private imports from the dollar area to more than 90% of the total. German importers could then buy about as freely from dollar countries as from those in western Europe. New tariff cuts became effective on July 1 for an 18-month period. These were designed to encourage imports, and thereby to help keep down domestic prices and to relieve inflationary pressures building up in the booming German economy.

In the first half of 1956 French imports rose by more than 10% over those of the first half of 1955, even though, for certain statistical reasons, the 1956 period of calculation was shorter by several days. The decline of nearly 5% in exports (to \$2,284,000,000) was exaggerated slightly by this change in the period of calculation. The trade deficit, which amounted to \$488,000,000 in the first half of 1956 compared with a small surplus of \$20,000,000 in the comparable period of 1955, was largely responsible for the decline in French gold and foreign exchange reserves by about \$200,000,000 between the two periods. The French government had permitted a record value of imports in the first semester of 1956 in an effort to counteract the inflationary pressures of rapidly rising internal demand on domestic production of industrial supplies and consumer goods. Forces inflating the de-

mand for imports also caused some of the normal export supplies to be drained off to supply the domestic market, thus widening the trade deficit still further.

Demand remained strong in 1956 for Belgian exports, the value of which rose during the second quarter by 10% over the first quarter, and by 25% over the first quarter of 1955. Imports increased by approximately the same percentage as exports, so that the trade of Belgium-Luxembourg continued to remain in balance in the first six months of 1956 as it had been in the corresponding period of 1955. Some concern was felt over the threat of inflation and the effect it might have on Belgium's competitive position in world markets, but the rise in the price index was still moderate, relative to that of many other western European countries.

The Netherlands' economy in 1956 was likewise expanding, but nevertheless exports were expected to be limited more by capacity to produce than by demand for goods. Between the first halves of 1955 and 1956, they had risen by 10%. Imports more than kept pace, rising in the first half of 1956 by 15% over the previous year and causing the trade gap to widen by about \$90,000,000.

United Kingdom.—During the first six months of 1956 the trade of the United Kingdom showed a steady rise in value and a smaller, but nevertheless substantial, rise in volume. Exports which totalled £1,674,000,000 in January-June 1956 were 14% above the level of the same period of 1955. Dock strikes were considered to have distorted the 1955 data to some extent. Official estimates of the "underlying increase" in the value of exports, after allowing for strikes and for the United Kingdom's repayment of silver bullion to the United States from April 1956, were only 10%. It was calculated that imports, which rose in terms of recorded value by 4% above the first six months of 1955 (to £1,980,000,000), were only 2% greater in value when the effect of the 1955 strikes was discounted. The index of terms of trade for January-June 1956 showed little change from 1955, indicating that the rise in prices of goods exported was almost exactly compensated by the increase in prices of goods imported.

As can be seen from Table V, the most striking change in the direction of British trade in January-June 1956—as compared with that of a year earlier—was the increased level of goods moving to the nonsterling countries. These exports, totalling £154,000,000 a month in the first half of 1956, were 23% above the

Table V.—United Kingdom's Trade, by Areas

(In monthly averages in millions of pounds sterling)

Period	Total	Dollar area	Sterling area	O.E.E.C. countries and related areas	Rest of world
General imports, c.i.f.					
1955: First half	317	66	136	76	39
Second half	331	74	126	84	47
1956: First half	330	68	134	82	46
Exports and re-exports, f.o.b.					
1955: First half	242	31	117	67	27
Second half	262	38	125	69	30
1956: First half	279	45	125	75	34
Excess of imports over exports					
1955: First half	75	35	19	9	12
Second half	69	36	1	15	17
1956: First half	51	23	9	7	12

level of a year earlier. Exports to the dollar area in particular showed a significant jump. Greater amounts of machinery, cars, aircraft, ships, whisky and woollens figured in the increase. Exports to the United States, which had moved steadily upward since the latter part of 1954, rose 37% above the level of January-June 1955, while those to Canada were 47% greater. Larger deliveries of ships to other dollar countries—Liberia, Panamá and Venezuela—were key dollar earners. Exports to O.E.E.C. countries were 10% greater in the first six months of 1956 than in the comparable period of 1955. Substantial increases occurred in shipments to Belgium, France, the German Federal Republic, Norway and Sweden.



"IS OFFERING USUAL EASY TERMS to friendly nations, comrade trade delegate! 10% off for cash or 10% infiltration of Communists in their government!!" another 1956 cartoon by Lichty of the Chicago Sun-Times Syndicate

Rises in imports from nonsterling area countries more than accounted for the over-all increase in British imports during the first six months of 1956. There were heavier imports of cereals, fruits and vegetables, sugar, paper and machinery from the dollar area. Larger iron and steel imports contributed heavily to an 8% rise in total imports from O.E.E.C. countries.

Trade with the whole sterling area showed relatively little change from 1955. Exports rose in value by 7% as imports declined by 1%. A dock strike in Australia early in 1956 delayed arrivals from that area, reducing imports by 14% in the first six months compared with a year earlier. There were larger imports of meat and dairy products from New Zealand. Exports to Oceania, where sterling imports were restricted for balance-of-payments reasons, declined, as did those to Pakistan. Sales to India and to the colonies rose considerably. These shifts in trade with sterling countries brought about a decline in the trade deficit with the area from £114,000,000 in the first half of 1955 to £57,000,000 in the first half of 1956.

The expansion in British trade between the first halves of 1955 and 1956 occurred most noticeably in capital goods from the metals and engineering fields, as indicated in Table VI. Manufactured consumer goods rose more moderately. Exports of engineering products were at their highest level, a full 21% above the value of January-June 1955. Chief among these exports were several large ship deliveries—notably the "Empress of Britain" to Canada and the "Bergensfjord" to Norway. All types of heavy machinery showed increases in export values, as did most electrical machinery. Aircraft exports, at £6,500,000 a month, were more than twice as much as in January-June 1955. Exports of cy-

cles, motorcycles, and commercial vehicles were all greater, but those of motor cars, especially influenced by reductions in Australian and New Zealand sterling imports, fell by 15% in quantity. Metal exports rose by 18% compared with those of a year earlier. Most important were copper and aluminum where increases in price as well as quantity contributed to the substantial rise.

Imports of food, beverages and tobacco, which constitute nearly 40% of British imports, were valued at about the same total level in January-June 1956 as in the like period of 1955. Compared with a year earlier, the principal changes were reductions in imports of cocoa beans, tea, cereals and feed balanced by increases in meat, dairy products, fruits and vegetables. Price declines were a significant factor in the reduction of tea and cocoa values. The rise in the value of meat imports was accounted for by increases in imports of chilled beef, mutton and lamb. More butter and more and higher-priced cheese caused a 14% increase in the value of dairy imports. Among the basic raw materials necessary for the operation of the British economy, imports of timber, pulp and textile fibres declined in value, but were almost counterbalanced by increases in the value of imported fats and oils, steel-making materials and rubber.

Union of South Africa.—The foreign trade of the Union of South Africa showed further rises in the first half of 1956, despite the fact that this period was marked by a continuation of the slowdown in internal economic development which began in 1955. There were minor relaxations in import controls made toward the end of 1955, but these had relatively little impact on the volume of imports through the first six months of 1956. Exports rose by \$40,000,000 in January-June 1956, as compared with the same months of 1955, fruits and minerals being the principal commodities with larger sales. Prices of wool, South Africa's largest earner of foreign exchange after gold, declined in 1956 to such a point that, although the clip was the largest in 20 years, it was valued at more than South African £5,000,000 less than the 1955 crop.

Gold exports, which are not included in South Africa's trade totals, but are used as a commodity to balance its trade deficit, continued to rise. Output for the first six months of 1956 again set a record and was valued at SA£96,500,000. Despite this gain, the first week in July saw South Africa's reserves of gold and foreign exchange at their lowest level since May 1954.

Middle East.—Although trade data for many middle eastern countries are inadequate and slow to be published, available information for early 1956 pointed to the year as a likely period of rising trade. Development plans in many countries were beginning to bear fruit, as export earnings rose sufficiently to enable increased imports of capital goods and equipment as well as incentive consumer goods.

Egypt's exports in the first half of 1956 showed a rise for the first time since 1952. At Egyptian £90,000,000, they were 36% above export earnings in the corresponding period of 1955. Improved shipments at better prices of long-staple cotton,

Table VI.—United Kingdom's Trade in Selected Commodities

(In millions of pounds sterling)

Commodity group	First half		Per cent change		Commodity group	First half		Per cent change
	1955	1956				1955	1956	
General imports, total.	317	330	+ 4		Domestic exports, total	232	265	+14
Meat and preparations	23	24	+ 4		Food	14	14	..
Dairy products	14	16	+14		Basic materials	9	10	+11
Cereals and preparations	20	19	- 5		Coal and petroleum products	12	13	+ 8
Fruits and vegetables	19	23	+21		Chemicals	18	20	+11
Coffee, cocoa, tea and spices	20	14	-30		Cotton yarns and fabrics	8	7	-12
Other food	26	27	+ 4		Iron and steel	13	14	+ 8
Wood and cork	12	10	-17		Nonferrous base metals	5	8	+60
Wool	18	17	- 6		Metal manufactures	13	14	+ 8
Metalliferous ores and scrap	13	14	+ 6		Machinery other than electric	37	43	+16
Other basic materials	47	49	+ 4		Electric machinery and appliances	15	18	+20
Coal and petroleum	33	36	+ 9		Road vehicles and aircraft	28	33	+18
Nonferrous base metals	18	19	+ 6		Ships and boats	4	8	+100
Other manufactured goods	53	60	+13		Other manufactured goods	50	56	+12
All other commodities	1	2	+100		All other commodities	6	7	+17

Egypt's major commodity export, were primarily responsible for the increase. Prices of cotton were nearly 50% higher in May than at the beginning of the crop year in Sept. 1955. About 28% of Egypt's total exports represented cotton for the Soviet Union, compared with 14% in January-June 1955.

Egypt's total imports in the first six months, excluding wheat imported from the United States under Public Law 480, amounted to £105,000,000. This was a 23% increase over the value of imports in the like period of 1955. It represented a slower rate of increase than that of exports, thereby narrowing the unfavourable trade balance for the period in comparison with January-June 1955.

Two of the middle eastern countries for which data were available—Iraq and Iran—are heavily dependent on petroleum for their export earnings. In both countries, the average daily crude oil production continued to rise, bringing with it the opportunity for larger imports. In Iran, payments by members of the oil consortium (foreign oil companies) to the government of Iran rose substantially. Imports of all kinds of goods were larger than in 1955, especially of iron and steel products. Iranian trade with the U.S.S.R., normally one of Iran's major trading partners, declined by almost 50% because rice was not available for export. Imports of cars, trucks, tires, pharmaceuticals and luxury goods from the United States were more important than formerly, as were cars, photographic materials, iron and steel and household goods from Germany. In Iraq, where 70% of the oil revenues were set aside for development purposes, trade was booming for such goods as automobiles, trucks and heavy construction and road-building machinery.

Israel, which regularly runs a substantial trade deficit financed by earnings from other sources and by foreign loans and investments, increased its deficit by 15% over the first half of 1955. Exports of January-June 1956 totalled Israeli £111,000,000, while imports were £330,000,000, leaving a deficit of £219,000,000 as compared with £194,000,000 for January-June 1955.

Far East.—The generally expansive economic situation in the industrially developed countries of the western world was reflected in the favourable trading patterns of the countries of the far east, as demand in the first half of 1956 continued high for raw materials. Not every country was sharing in the upward movement of trade, but that it was quite widespread can be seen from Table VII.

Indian exports during the first half of 1956 were running at about the same level as in the corresponding period of 1955. Imports, on the other hand, rose by more than 20% between these periods. A number of internal factors were responsible for the sharp rise. Among them were the initiation of India's second five-year development plan, which became effective April 1, 1956, and under which a new import policy was announced further liberalizing the entry of "essential" commodities into India in order to increase the tempo of industrial development. A second

major reason for the rise in the value of imports was the government's attempt to use larger imports as a means of combating inflation. The rubber-dependent Malayan economy showed signs of weakening, as rubber prices dropped during the second quarter of 1956, but when they turned upward again in June, continued prosperity was in prospect. Export and import totals for January-June 1956 were well above those for comparable periods of the last several years. Exports of rubber, tin, iron ore and bauxite were all at high levels during the period. Imports, primarily food and manufactured goods as usual, rose to such a level that Malaya's normal export surplus shifted to an import surplus in the first half of 1956.

The Philippine economy showed a general expansion during the first half of 1956 which was reflected in rising values for exports. Since export prices remained stable, this increase was explained almost entirely by greater volume of goods. Contrariwise, imports in the first half of 1956 declined from levels of a year earlier. In the case of imports, prices had risen by about 10%; the import volume, therefore, had dropped substantially. The trade situation of Thailand, despite certain problems, was considered generally good through the first half of 1956. There were difficulties in obtaining rice for export (Thailand's principal export commodity) because of shortages induced by lowered stocks, transportation delays and some speculative withholding. Prices of rubber fell in the second quarter, as in Malaya. Nevertheless, rubber export earnings increased in value with greater quantities being shipped. Tin, Thailand's third most important exchange earner, continued to bring a good income. Imports in the first semester of 1956 equalled the record level of the last half of 1955, and were far above any other previous half-year period.

The foreign trade of Taiwan (Formosa) in the first half of 1956 showed a surplus of \$8,600,000 despite the fact that exports rose by 10% above 1955 levels and imports, excluding United States aid, were higher by nearly 40%. Exports of a wide variety of goods expanded, including sugar (63% of total exports), citronella oil, coal, cotton yarns and various other agricultural products.

During January-June 1956 Indonesia's trade balance was an unfavourable one for the first time since 1952. Up to 1956, the volume of exports had remained about the same for several years, though values had increased, while imports (subject to strict licensing) declined both in value and in volume. A freer trade program introduced in Sept. 1955 resulted in a great jump in imports, accompanied by little change in export values. In Aug. 1956 the Indonesian government put into effect a new plan designed to stimulate lagging exports. Bonuses ranging from 3% to 20% of the f.o.b. proceeds were to be paid on about 30 export commodities, including rubber, copra, coffee, tea and sugar. The issuance of import licenses was suspended until further notice except on wheat flour, rice and goods for certain industrial and developmental projects.

Japan's industrial production during the early months of 1956 reached an all-time high, with a consequent jump in exports (through June 1956) of 30% as compared with the first half of 1955. Rises in exports of ships, iron and steel and cotton fabrics were among the most important. In the first six months of 1956 imports increased by about 23%; imports of iron ore and scrap rose sharply, as did those of petroleum and raw wool. Despite a trade imbalance, however, Japan's foreign exchange receipts continued to exceed payments. The increase in merchandise imports was not completely reflected in this situation, as Japan financed substantial amounts of imports under deferred payments arrangements.

Oceania.—The Australian economy in 1956 was in a period of transition. As the phenomenal economic growth of the years

Table VII.—Trade of Principal Far Eastern Countries

Country	Exports, f.o.b.			Imports, c.i.f.		
	1956			1956		
	1955	Jan.—March (annual rates)	April—June (annual rates)	1955	Jan.—March (annual rates)	April—June (annual rates)
Australia . . .	1,750	1,380	2,172	2,160	2,054	2,054
Argentina . . .	227	259	*	180	179	200
Ceylon	407	343	363	307	320	313
Hong Kong . . .	444	546	610	651	775	862
India	1,279	1,333	1,106	1,361	1,694	1,616
Indonesia . . .	932	768	865	604	845	913
Japan	2,011	2,230	2,404	2,471	2,769	3,228
Malaya and Singapore . .	1,358	1,437	1,286	1,249	1,367	1,353
New Zealand . .	724	925	794	804	715	*
Pakistan	401	516	288	290	266	271
Philippines . . .	389	433	467	613	494	592
Thailand	335	333	313†	334	382	356†

*Not available. †Partially estimated.

since the war continued, the government found it necessary to take further steps to restrain inflationary demand by attempting to cut imports and to raise exports. Trade returns through Australia's fiscal year ending June 1956 showed imports of Australian £821,000,000, about A£23,000,000 less than in the preceding fiscal year. Exports for the same period totalled A£784,000,000, leaving a trade deficit for the 12 months of A£37,000,000, well below that for the fiscal year 1955 of A£70,000,000. In an effort to correct the unbalanced payments situation, new import restrictions were put into effect in Oct. 1955. When these appeared not to be stringent enough, further cuts designed to reduce imports by another A£40,000,000 a year were announced effective July 1, 1956.

Normally more than half of Australia's overseas earnings come from exports of wool and another 7% to 10% from wheat and flour. The 1955-56 fiscal year brought successful attempts to broaden this base in many fields where new Australian industries were being developed, notably chemicals, electrical equipment, tobacco, timber and engines.

New Zealand's overseas deficit during the year ended June 30, 1956, was only New Zealand £5,000,000 compared with NZ£42,000,000 in the previous fiscal year. Heavy restrictions on imports helped to achieve a near balance on current account. With the aim of giving the country's many new industries protection against imported goods, the New Zealand board of trade was working on a revision of the 1938 customs tariff during the course of 1956, but this new tariff was not expected to come into force until 1958.

(See also BUSINESS REVIEW; EXCHANGE CONTROL AND EXCHANGE RATES; FOREIGN AID PROGRAMS, U.S.; FOREIGN INVESTMENTS; INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT; INTERNATIONAL MONETARY FUND.)

(F. L. H.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Distribution of Foods* (1946); *Food and People* (1956); *Planning Our Foreign Policy* (Problems of the Middle East) (1955); *Round Trip: The U.S.A. in World Trade* (1952); *World Affairs Are Your Affairs* (1952); *World Trade for Better Living* (1951).

International Wheat Agreement: see AGRICULTURE; WHEAT.

Interstate Commerce Commission. The duties and powers of the U.S. Interstate Commerce commission are set forth in the Interstate Commerce act, passed in 1887 and later amended in many important particulars, and in related acts. The act, divided into four parts, deals with the regulation of (1) railroads and related agencies and oil pipelines; (2) motor carriers; (3) water carriers; and (4) freight forwarders. The commission's regulatory powers extend to, among other things, carrier charges; questions involving the valuation and financial reorganization of railroads; the issuance of securities; acquisition of control of carriers by other carriers or persons; accounting practices and the filing of reports; matters involving proposed institutions of new services by motor and water carriers or freight forwarders or the construction, abandonment and operation of lines of railway; and safety of facilities and operations in rail and motor transportation. Much interstate motor and water transportation is carried on under exemptions from regulation and by private carriers.

The commission is composed of 11 members appointed by the president.

There were several amendments to the act during 1956, the most important of which defined exemptions for motor vehicles of farmers, co-operative associations or federations thereof, and also of private carriers, under certain circumstances, from regu-

lation by the commission as to the duration of the lease, or the amount of compensation to be paid for the lease of such vehicles. Another amendment requires the commission, under certain circumstances, to establish for motor carriers of migrant workers reasonable requirements with respect to comfort of passengers, qualifications and maximum hours of service of operators, and safety of operation and equipment.

The date of Dec. 31, 1955, fixed for expiration of a general increase of 15% in rail rates, authorized in stages in 1951 and 1952, was removed, and the increase became permanent on Oct. 17, 1955. A further general increase of approximately 6% became effective on March 7, 1956. Water carriers and freight forwarders were permitted the same general increases, and authority was also granted during the year for motor carriers of general freight, in various areas, to advance the levels of their rates.

The railroads' share of intercity ton-miles was slightly less than 50% in 1955. Railroad revenue, \$10,900,000,000 in fiscal 1956, was 58% of the revenues of all carriers subject to the commission's jurisdiction. In the first seven months of 1956, rail ton-miles and revenues increased approximately 6% above the level of that period of 1955, but net income, after taxes, decreased 9%.

Expenditures for capital improvements for the first six months of 1956 were at a higher level than for the same period in 1955. Technological and operational advances were continued. Diesel locomotives, during the first six months of 1956, accounted for 88% of railroad freight and 91% of passenger service. This compares with 86% and 88%, respectively, for the same period in 1955, and 10% and 13%, respectively, for that period of 1946.

Beginning in Feb. 1956 freight car shortages again reached serious proportions. The building of freight cars remained below the level of retirements, which continued at a substantial pace. Six service orders were issued by the commission to alleviate the car supply. Motor carrier facilities continued in ample supply, and there were substantial additions to the equipment of inland water carriers. Highway improvements, including extensions of toll roads, were continued at a high level, and a program calling for even more extensive modernization of highway systems was enacted by congress. In recognition of a need for additional funds to enable the commission to strengthen its regulation of carrier safety activities, the independent offices appropriation bill for 1957, which was passed by congress, carried a record appropriation of \$14,879,696 for the commission.

(See also RAILROADS.)

(R. F. ML.)

Intestinal Disorders: see STOMACH AND INTESTINES, DISEASES OF THE.

Intoxication, Alcoholic. During 1956 increased interest was evidenced in medical circles in the problem of alcoholism. There was a lively contention about the nature of the problem. Some claimed that it is a disease, others maintained that it is a symptom, and still others described it as a pattern of behaviour. It is obviously a pattern of behaviour, psychologically understandable in terms of an escape mechanism. Sometimes problem drinking is merely a symptom of an underlying and basic depression, and some problem drinking merely develops in certain susceptible persons as an exaggeration of social drinking.

Most interesting were the speculations and investigations into the nature of alcoholism as if it were a disease. If it is a disease, it is characterized by several prominent features: (1) a craving for alcohol; (2) usually a waning of the ability of the body to burn the alcohol, which increases in the years between 20 and 50; (3) pathological side effects with peculiar forms of intoxica-

tion. Some authorities believe that alcoholism can be compared with diabetes to some extent, in that the body appears to be unable to burn alcohol ingested at a rapid rate. Alcohol taken into the body of an alcoholic produces signs of intoxication and may be said to circulate as does antifreeze in an automobile radiator. The molecules of alcohol continue to bombard the brain cells with untoward results. In this way alcohol may be considered a nerve poison, for the effects are certainly not "stimulating" as so many persons believe; in fact, alcohol is actually narcotic or depressant in its action. Obviously it depresses the cerebral cortex.

Alcoholics Anonymous had become a powerful moral force in all large communities. It provided alcoholic persons with something that was hard to describe but that was valuable to those who were willing to seek its help. More state legislatures and municipal committees were accepting the problems of alcoholic persons in their thinking and action, thereby making alcoholism more than ever before a public health problem. The use of Antabuse was widespread, and although it had natural hazards it was definitely useful in some cases.

If one goes on the theory that alcoholism is a deficiency disease (such as diabetes), then it is logical to suppose that the site of hypothetical lesion may be the liver, because the body treats alcohol as if it were sugar. However, no such specific substitute as insulin had been found. Nevertheless, a large number of drugs are helpful in the treatment of alcoholism; for example, Dexamyl and other forms of the amphetamine compounds, which relieve the depression in which the drinking occurs. In some cases it is as if the person who is depressed were trying to treat himself by drinking. This self-medication, using alcohol as a drug, never works because alcohol produces a momentary lift, then appears to increase the depression. If alcohol actually relieved depression, it would be one of the most useful drugs in the world. Certain persons who drink when they are tense, for "Dutch courage," were finding relief in the ataractic drugs. The essential treatment of alcoholism is to stop drinking or to learn not to drink in excess. If alcoholism is merely a craving, then will power is the best remedy, but the situation is not so simple as that.

Most important during the year 1956 was the increase of public information about alcoholism and of possibilities of its treatment as a medical disorder and the publication of several excellent books on the subject, including *Alcoholism*, edited by George N. Thompson, which contains much valuable information for physicians, and *Understanding and Counseling the Alcoholic*, *Through Religion and Psychology* by Howard J. Clinebell. This book is written largely for the layman and for families that have to deal with the alcoholic person.

(See also LIQUORS, ALCOHOLIC.) (M. Mo.)

ENCYCLOPEDIA BRITANNICA FILMS.—*Alcohol and the Human Body* (1949); *Alcoholism* (1952).

Inventions: see ELECTRONICS; MUNITIONS; PATENTS AND TRADE-MARKS; PRINTING; TELEPHONE.

Investment Banking: see BANKING.

Investments, Foreign, in the U.S.: see FOREIGN INVESTMENTS.

Iowa. Iowa, nicknamed the "Hawkeye state," was admitted to the union in 1846 as the 29th state. The name of the state is derived from the Indian name meaning "This is the place" or "The beautiful land." Located in the north central region, Iowa comprises 56,290 sq.mi., of which 245 sq.mi. are inland water surface. The census figures for 1950 showed a population of 2,621,073, an increase of 2.9% over the 1940 figures, with 52.3% rural, a decrease of 4% since 1940. The population was 99.2% white, 96% native-born. The federal estimation of population for July 1, 1956, was 2,692,000, an increase of 2.6%

since 1950. The capital and largest city is Des Moines, with a 1950 population of 177,965. Other chief cities are Sioux City, 83,991; Davenport, 74,549; Cedar Rapids, 72,296; Waterloo, 65,198; Dubuque, 49,671; and Council Bluffs, 45,429.

History.—The general assembly, meeting in the odd-numbered years, did not meet in 1956. A tax study committee, appointed to prepare recommendations for revising the tax structure of the state, worked on the problem during the year but made no report before the November election. A proposed special session of the legislature, to deal with taxes, was not called.

The state officers during 1956 were: Leo A. Hoegh, governor; Leo Elthon, lieutenant governor; Melvin D. Synhorst, secretary of state; Chet B. Akers, auditor; M. L. Abrahamson, treasurer of state; Clyde Spry, secretary of agriculture; Dayton Countryman, attorney general; J. C. Wright, superintendent of public instruction. All state officers, the eight representatives in congress and Senators Bourke B. Hickenlooper and Thomas E. Martin were Republicans.

In the November election Iowa's majority for Pres. Dwight D. Eisenhower was about 228,000, a reduction from the 357,000 majority in 1952. All the state officers were re-elected, with the exception of Governor Hoegh, who was defeated by a Democrat, Herschel C. Loveless, and the attorney general, Dayton Countryman, who was not a candidate. Republican Norman Erbe was elected attorney general. Senator Hickenlooper and seven of the eight representatives in congress were re-elected, incumbent James I. Dolliver in the 6th district being defeated by his Democratic opponent, Merwin Coad. In the Iowa general assembly, the Democrats increased their membership from 4 to 10 in the senate (total of 50 members) and from 14 to 33 in the house (total of 100 members). The voters passed by a three-to-one margin a \$26,000,000 bond issue for bonuses for Korean war veterans.

Education.—During 1955-56 Iowa had 2,901 public elementary schools, with 412,584 students; 790 high school districts with 126,160 students; and 16 public junior colleges with 1,837 students. The number of teachers and superintendents in the public schools on June 30, 1956, was 25,750. Teacher salaries in 1956 averaged \$3,536 as compared with the 1955 average of \$3,270.

There are 23 private colleges and universities in the state and three state-supported institutions: the state university at Iowa City; the agricultural college at Ames; and the teachers college at Cedar Falls. Enrolment in the three state institutions for the fall semester of 1956 was 22,644, an increase of 1,192 over 1955. Total enrolment in all public and private institutions of higher learning in 1956 was 46,106, an increase of 8.1% over 1955. The appropriation for the three state schools voted by the 1955 legislature was \$39,297,062 for the 1955-57 biennium, as compared with \$36,517,476 for the 1953-55 biennium.

Social Insurance and Assistance, Public Welfare and Related Programs.—The allocation for social welfare totalled \$33,070,000 for the 1955-57 biennium, as compared with \$34,640,000 for 1953-55. Contributions to the state unemployment fund as of June 30, 1956, were \$5,152,403, compared with \$4,034,830 for 1955; benefit payments were \$6,685,415, compared with \$7,222,934 for 1955; the reserve fund, as of June 30, 1956, totalled \$107,754,045.

Iowa's three penal and two correctional institutions had 3,102 inmates as of Aug. 1956. The six mental hospitals had 8,202 patients.

Communications.—Iowa had a total of 7,657 mi. of paved highways as of June 30, 1956. Expenditures for construction in the fiscal year 1955-56 were \$43,272,929; maintenance costs for the same period were \$10,151,384. The state is served by 12 major railroads with a total track mileage of 8,584 mi. In 1955 there were 1,194,003 registered motor vehicles, private and commercial.

Iowa has about 850,000 telephones, 50 radio stations, and 12 television stations. There are about 70,000 mi. of electric transmission lines in the state, and 97% of all farms are electrified.

Banking and Finance.—There were, as of June 30, 1956, 564 state banks in Iowa, 161 bank offices, 258 small loan licensees, and 290 credit unions under the supervision of the state banking department. Total assets of the 564 state banks as of June 30, 1956, were \$1,936,222,800 (an increase of \$24,392,176 over the 1955 figures); total deposits were \$1,766,744,835 (an increase of \$14,248,996 over the 1955 figures). As of April 10, 1956, there were 95 national banks in the state with total deposits of \$884,507,000 and total resources of \$958,087,000.

The revenue received from all special taxes and liquor profits in Iowa for the fiscal year 1955-56 was \$237,150,374, an increase of \$33,948,995 for the 1954-55 figure. Total allocations from this fund amounted to \$210,473,738. The largest single item was the 2½% sales tax, which brought in \$68,813,390; second was the gasoline tax, totalling \$54,472,049; motor vehicles brought in \$39,196,537; while the state income tax totalled \$25,548,812 for individuals and \$3,190,239 for corporations.

Agriculture.—Iowa has 25% of all grade A land in the country and produces more than 10% of the nation's food. The state usually leads the

Table I.—Principal Crops of Iowa

Crop	Indicated 1956	1955	Average, 1945-54
Corn, bu.	500,973,000	522,200,000	539,996,000
Oats, bu.	144,585,000	258,011,000	214,156,000
Wheat, bu.	2,222,000	3,364,000	4,041,000
Rye, bu.	260,000	374,000	168,000
Potatoes, cwt.	360,000	450,000	670,000
Hay, tons	5,568,000	6,958,000	5,925,000
Soybeans, bu.	54,140,000	43,582,000	37,202,000
Timothy seed, tons	1,170,000	3,041,000	3,167,000

Source: U.S. Department of Agriculture.

Table II.—Livestock of Iowa, Jan. 1

	1956	1955
Hogs	11,602,000	12,048,000
Cattle	6,223,000	6,279,000
Sheep	1,247,000	1,307,000
Horses and mules	88,000	92,000
Chickens	27,717,000	30,378,000
Turkeys	154,000	141,000

nation in value and production of corn, oats, pigs, poultry, eggs, and the marketing of grain-fed cattle and is second in production of soybeans and butter. There were 192,028 farms in Iowa in 1955, compared with 194,623 in 1954. These farms had a total of 34,746,569 ac.; the average size was 180.9 ac. In 1955, 50% of Iowa farms were owner-operated; 50% tenant-operated.

The total cash income of Iowa farmers for 1955 was \$2,145,039,000; of this total, \$1,671,503,000 was from the sale of livestock; \$466,100,000 from crops, and \$7,436,000 from government payments. The total cash income was \$211,720,000 less than in 1954. On Jan. 1, 1956, there were 66,738 trucks on Iowa farms, 284,316 tractors, 85,455 grain combines, and 107,338 mechanical cornpickers; all figures showing an increase over the 1955 figures.

In 1955 Iowa produced 4,855,000,000 eggs, 181,100,000 lb. of butter, and 22,099,000 lb. of cheese.

Manufacturing and Industry.—Iowa's principal industries are based on farm needs and farm production: agricultural machinery, meat packing plants, food processing plants. There were 3,736 manufacturing plants in Iowa, employing 165,256 persons, in 1955. The average weekly wage was \$75.67, as compared with \$76.39 in 1954. The estimated value of all manufactured products was \$3,900,000,000, an increase of \$100,000,000 over the 1954 figure. Iowa's per capita income for 1955 was \$1,577, a decrease of \$90 from the 1954 figure. The cost-of-living index for 1955 was 114.7 as compared with 101.8 in 1950. (M. Te.)

Table III.—Principal Industries of Iowa

	All employees 1954	Salaries and wages 1954 (in 000s)	Value added by manu- facture 1954 (in 000s)	Value added by manu- facture 1953 (in 000s)
Food and kindred products	51,227	\$202,376	\$361,297	\$353,913
Apparel and related products . . .	3,975	9,449	12,541	*
Printing and publishing industries .	11,393	44,610	85,735	*
Chemicals and allied products . . .	6,028	24,928	76,678	*
Rubber products	3,534	14,238	38,305	33,204
Stone, clay and glass products . . .	5,381	20,651	54,229	51,569
Primary metal industries	5,570	23,789	53,272	40,060
Fabricated metal products	6,258	25,979	49,234	51,701
Machinery (except electrical) . . .	32,765	140,509	231,732	281,424
Electrical machinery	8,999	31,659	57,294	49,413
Transportation equipment	4,623	20,674	29,431	25,882
Instruments and related products . .	2,073	8,674	17,016	*
Miscellaneous manufactures	8,997	36,150	84,884	57,528

*Withheld because the estimate did not meet publication standards, either on the basis of the associated standard error of estimate or on the basis of a consistency review.
Source: U.S. Department of Commerce, *Annual Survey of Manufactures, 1954*.

Table IV.—Mineral Production of Iowa

Mineral	1953		1954	
	Quantity	Value	Quantity	Value
Total		\$51,994,000*		\$58,798,000*
Cement (bbl.),	9,111,000	23,330,000	9,859,000	27,044,000
Clays	913,000	975,000	883,000	921,000
Coal	1,388,000	5,262,000	1,197,000	4,503,000
Gypsum	1,152,000	2,940,000	1,107,000	3,036,000
Sand and gravel	10,385,000	6,401,000	12,200,000	9,277,000
Stone	10,715,000	13,215,000	13,240,000	16,388,000
Other minerals . . . . .	...	...	...	251,000

*Total has been adjusted to eliminate duplication in the value of clays and stone.
Source: U.S. Bureau of Mines.

Mineral Production.—Table IV shows the tonnage and value of those minerals produced in Iowa in 1953 and 1954 whose value exceeded \$100,000. Iowa ranked 30th among the states in the value of its mineral output, with 0.42% of the U.S. total in 1954.

ENCYCLOPÆDIA BRITANNICA FILMS.—*Middle States*, 2nd ed. (1955).

Iran (PERSIA). An independent kingdom of western Asia, Iran is bounded east by Pakistan and Afghanistan, north by the U.S.S.R., west by Turkey and Iraq and south by the Persian gulf and Arabian sea. Area: 636,293 sq.mi. Pop. (1955 est., no census ever taken): 21,146,000. Language: mainly Persian, but



OIL GUSHING from a newly discovered oil field in Iran in Aug. 1956. The well was spouting about 80,000 bbl. a day until it was capped

Turkic and Armenian in the northwest, Kurd in the west, Arabic in the south and Pushtu in the east. Religion: Moslem, mainly Shia, but the Kurds (850,000) are Sunni; Christian (there are about 50,000 Gregorian Armenians, a few thousand Catholic Armenians and 40,000 Nestorians); Jewish 40,000; and about 10,000 Zoroastrian. Chief towns (1950 est.): Tehran (cap.) 618,976; Tabriz 279,168; Isfahan 196,134; Meshed 191,794; Hamadan 123,931; Shiraz 116,274; Resht 111,978; Kermanshah 108,484. Ruler, Shahanshah Mohammed Riza Shah Pahlavi; prime minister in 1956, Hussein Ala.

History.—Iran's major problem in 1956 was economic reconstruction. The renewal of oil revenues contributed to an improvement, but the budget approved in April still showed a substantial deficit. The seven-year plan (originally drafted in 1948) was revised and contracts for the development of the country were carefully shared out on an international basis to British, U.S., French, Danish, Belgian and other firms. A new aid agreement was signed with the United Nations in February, and the possibility of a loan from the International Bank for Reconstruction and Development was discussed with its president, Eugene Black, when he visited Tehran in June. An offer of Soviet technical aid without political or military strings was received in June; but Iran preferred to remain economically linked with the west and gave a country-wide air-survey contract to a British firm and the Khuzistan development contract to a U.S. firm, although willing to sign a barter agreement to the value of £9,400,000 for 12 months with the U.S.S.R. in September. The major economic event of the year was the striking of what was called the biggest oil well in Iran near Qum, 75 mi. S. of Tehran, in August.

In foreign relations Iran continued to oscillate between east

and west. Iran's adherence to the Baghdad pact in 1955 had led to many Soviet protests, the third of which was rejected in April. But friendly relations with the U.S.S.R. were pursued through visits to Moscow by a parliamentary delegation at the beginning of the year and by the shah and his Empress Soraya in June. The royal couple also visited India in February and Turkey in May. The balance of international interest was kept even by again claiming Bahrein from Great Britain in April; by seizing the Soviet oil concession at Khuryan in June (which the U.S.S.R. agreed to surrender a month later); by a final settlement of border disputes with the U.S.S.R.; by expelling a Soviet military attaché for espionage; by supporting the U.S. plan for solving the Suez canal dispute at the London conference in August (the Iranian foreign minister being one of the committee of five who put the plan before Pres. Gamal Abdel Nasser); by entertaining a British parliamentary delegation in October; and by joining the neighbouring Baghdad pact powers (Turkey, Iraq and Pakistan) in calling on Great Britain and France to withdraw their troops from Egypt in November. The second annual council meeting of the Baghdad pact powers took place in April in Tehran, with the attendance of U.S. observers as well as the five member states.

The main domestic political events of the year were the opening of the new *majlis* (parliament) on June 14, when the prime minister, Hussein Ala, formally resigned and was re-appointed by the shah; and the release from jail on Aug. 4 of the former prime minister, Mohammed Mossadegh, at the end of a three-year sentence for unconstitutionally opposing the shah in 1953.

(C. M. WE.)

Education.—Schools (1953-54): primary 5,959, pupils 790,200, teachers 26,965; secondary (1951) 308, pupils (1953-54) 119,300, teachers (1951) 3,304; vocational (1950) 186, pupils 7,776, teachers 494. Universities 2, students (1954-55) 9,197 (including 348 at secondary teacher training college).

Finance and Banking.—Monetary unit: rial, with a principal buying rate of 75 and a principal selling rate of 76.50 to the U.S. dollar. Budget (1954-55 actual; 1956-57 est. in parentheses): revenue 11,300,000,000 rials (15,800,000,000 rials); expenditure 14,800,000,000 rials (19,800,000,000 rials). Currency circulation (Dec. 1954) 9,570,000,000 rials, (Dec. 1955) 9,720,000,000 rials. Deposit money (Dec. 1954) 8,940,000,000 rials, (Dec. 1955) 10,500,000,000 rials. Gold and foreign exchange (Feb. 1955) U.S. \$220,000,000, (Feb. 1956) U.S. \$197,000,000. Foreign exchange receipts from oil operations (March 1955-56): U.S. \$135,000,000.

Foreign Trade.—(1955-56) Imports (excluding duty free imports) 9,098,000,000 rials at official rate; 23,972,941,000 rials at commercial rate. Exports (excluding oil) 3,315,000,000 rials at official rate; 8,019,726,000 rials at declared value; oil exports at official rate 3,792,000,000 rials; at value declared 9,405,000,000 rials. Main sources of imports (1955): U.S. and Canada 24%; Germany 18%; continental E.P.U. (European Payments Union countries) 32%; U.K. 10%; Japan 10% (1953-54): U.S.S.R. (1953-54) 5.7%; India (1953-54) 7.6%. Main destinations of exports: Germany 8%; other continental E.P.U. 27%; U.S. and Canada 11%; U.K. 14%; U.S.S.R. 12.8% (in 1953-54); Japan 12% (1953-54). Main exports (1953): rugs 16%; cotton 17%; petroleum 2%.

Transport and Communications.—Roads (1953) 26,000 km. Motor vehicles use (March 1955): passenger 29,245, commercial 25,054. Railways (1954) 2,600 km.; passenger-km. (March 1953-54) 412,000,000; freight ton-km. (March 1955-56) 1,251,600,000. Telephones (Jan. 1955) 51,300. Radio receiving sets (1950) 184,000.

Agriculture.—Production (metric tons, 1955; 1954 in parentheses): wheat 2,313,000 (2,100,000); barley 880,000 (820,000); cottonseed 60,000 (120,000); cotton, lint 60,000 (60,000); jute 4,000 (4,000); rice 322,000 (526,000); wool 10,000 (10,000); beet sugar, raw (1955-56) 4,000, (1954-55) 69,000; raisins (1954) 50,000, (1953) 48,800; dates (1954) 140,000, (1953) 125,000; tobacco (1954) 14,600, (1953) 18,500. Livestock (March 1955): cattle 3,349,000; sheep 21,650,000; horses 50,000; mules 93,000; asses 1,300,000; goats 9,728,000; camels 100,000; fidoes (Sept. 1952) 120,000.

Industry.—Production (metric tons): crude oil (1955) 15,780,000, (1954) 3,504,000; coal (March 1954-55) 155,000; cement (1954) 1,000; electricity, installed capacity (1954 est.) 125,000 kw. (excluding 1,000 kw. in southern oil fields); cotton fabrics (1953 est.) 110,000,000 m.

ENCYCLOPÆDIA BRITANNICA FILMS.—*Iran—Between Two Worlds* (1954); *The Middle East* (1955).

An Arab kingdom, Iraq is bounded northwest by Syria, north by Turkey, east by Iran, southeast by Kuwait and the Persian gulf, south by Saudi Arabia and west by Jordan. Area: 171,599 sq.mi. Pop.: (1947 census) 4,816,185; (1955 est.)

5,200,000. Language: Arabic 77%; Kurdish 15%; others 8%. Religion: Moslem 94%; Christian 3%. Chief towns (pop., city proper, 1947 census): Baghdad (cap.) 352,137; Mosul 133,625; Basra 219,167. King, Faisal (Feisal) II; prime minister in 1956, Nuri es-Said.

History.—Nuri Pasha es-Said's government continued to govern the country without any serious challenge during 1956, although an attempt was made to form an opposition outside parliament, restore party life to Iraq (after the dissolution of all parties in 1954) and proclaim a rival policy to that of Nuri Pasha. Mohammed Mehdi Kubba, former leader of the dissolved Independence party (extreme nationalist), and Kamel el-Chadirihi, former leader of the dissolved National Democratic party (allegedly communistic in outlook), formed a coalition in August to which they gave the name of "National Congress." The main features of the new party's program were the restoration of parliamentary democracy based on the party system, and the combating of foreign influences and all entanglements in military groupings or alliances. The minister of the interior, however, refused the application of the founders to form the party and denied the implication that there was no democracy or parliamentary government under the present regime.

In April the evacuation of the royal air force units stationed at the Habbaniya and Shaiba bases was completed in accordance with the special agreement concluded between Iraq and Great Britain in 1955. Arrangements were also made for the purchase by Iraq from Great Britain of arms valued at £2,000,000 during 1956-57 in return for Great Britain's waiving its claim to the value of British military installations left in Iraq, estimated at £2,755,000.

Relations between Iraq and Egypt eased somewhat during the year, in spite of continued tension between the two countries over the future of Jordan. On the Suez canal issue Iraq gave at least formal support to Egypt and joined in the Arab league meeting in Cairo during September which condemned the attitude of Great Britain and France. On the other hand, Iraq strengthened its relations with Pakistan and Iran (two of its partners in the Baghdad pact) by concluding with them an agreement to launch a joint shipping company with a capital of £15,000,000 to operate between Pakistan and the Persian gulf.

A new development in Iraq's inter-Arab policy was the *rapprochement* that took place with Saudi Arabia during the Suez crisis. King Faisal II visited King Saud at Riyadh, and the general interpretation indicated that the two oil-producing countries were finding a common interest in their anxiety lest their royalties should suffer as a result of the dispute between Egyptian President Gamal Nasser and the western powers.

Iraq's relations with Jordan alternated between improvement and deterioration. After the dismissal of Lieut. Gen. J. B. Glubb from the command of the Arab legion (*see* JORDAN) and Jordan's rejection of the Baghdad pact, Egyptian influence seemed to be gaining ground in Jordan at the expense of Iraq. Then came a change when the Jordanians seemed to be turning again toward Iraq, particularly for military support after the Israeli attack on Husan in September. Iraq, however, was said to have laid down certain conditions for the requested military aid, notably a unified command of Jordanian and Iraqi troops under an Iraqi officer, which Jordan was unwilling to accept.

After the attack on Egypt by Israel, Britain and France, Iraqi troops entered Jordan in November at the request of the Jordanian government. Meetings were held between representatives of Iraq, Iran, Turkey and Pakistan (all the signatories of the Baghdad pact except Britain) which resulted in joint communiqués condemning the Israeli attack and calling on Brit-

ain and France to withdraw their forces from Egypt. Iraq's relations with Syria became extremely strained as a result of the growth of communist influence in the latter country. The blowing up of the oil pipelines in Syrian territory was a heavy blow to Iraq, inflicting on it a loss of about £5,000,000 a month.

(E. S. AH.)

Education.—Schools (1953-54) (including private and foreign): primary 1,549, pupils 280,478, teachers 9,521; secondary 197, pupils 46,463, teachers 2,679; vocational 11, pupils 1,874, teachers 90; teacher training colleges 11, students 1,744, teachers 78. Institutions of higher education 12, students 5,255, teaching staff 234.

Finance and Banking.—Monetary unit: Iraqi dinar at par with the pound sterling (=2.80 U.S. dollars). Budget (1953-54 final) revenue 47,720,843 dinars, expenditure 50,157,017 dinars; (1956-57 est.) revenue 61,675,750 dinars, expenditure 66,032,455 dinars. Currency circulation (Dec. 1954) 41,200,000 dinars, (Dec. 1955) 43,200,000 dinars. Deposit money (Dec. 1954) 20,000,000 dinars, (Dec. 1955) 21,900,000 dinars. Gold and foreign exchange holdings (Dec. 1954) U.S. \$287,500,000, (Dec. 1955) U.S. \$335,500,000.

Foreign Trade.—(1955) Imports 97,400,000 dinars of which 6,300,000 dinars by foreign oil companies; exports 185,700,000 dinars. Main sources of imports: U.K. 38%; other sterling area 13%; France and other continental E.P.U. (European Payments union countries) 25%; U.S. and Canada 15%. Main destinations of exports: continental E.P.U. and France 58%; U.K. 12%; U.S. and Canada 2%. Main exports: petroleum 91%; barley 3%; dates 1%.

Transport and Communications.—Roads (1954) 19,300 km. Motor vehicles in use (1955): passenger 14,052, commercial (including buses, taxis) 16,716. Railways (1955) 1,700 km.; traffic (April 1953-54): passenger-km. 524,990,700; freight, ton-km. 855,014,800. Air transport (1955): passenger-km. 21,844,000; freight, ton-km. 248,400. Telephones (March 1955) 32,824. Radio receiving sets (1954) 66,000.

Agriculture.—Production (metric tons, 1955; 1954 in parentheses): barley 768,000 (1,239,000); wheat 483,000 (1,160,000); rice 98,000 (180,000); cotton, lint 8,000 (7,000); cottonseed 15,000 (13,000); wool, raw, 8,000 (8,000); dates (1954) 350,000, (1953) 350,000; sesame (1954) 15,800, (1953) 16,200. Livestock (1953-54): sheep 10,000,000; cattle 1,510,000; buffaloes 718,000; horses 300,000; mules 500,000; (1953 est.): asses 1,000,000; camels 300,000; goats 2,000,000.

Industry.—Crude oil production (1955) 33,240,000 metric tons. Consumption of electricity in 1954: 390,034,000 kw.hr. including the Kirkuk oil fields.

ENCYCLOPÆDIA BRITANNICA FILMS.—*The Middle East* (1955).

Ireland, Republic of. The Republic of Ireland has about 85% of the area (south, centre and northwest; 26 of the 32 counties) and about 68% of the population of the whole of Ireland. Area: 27,136 sq.mi. Pop.: (1951 census) 2,960,593; (1956 preliminary census) 2,894,822. Languages: English about 76%, Erse (Gaelic) about 24%. Religion (1946 census): Roman Catholic 94.3%; Anglican 4.2%; Presbyterian 0.8%; Methodist 0.3%; Jewish 0.1%. Chief towns (pop., 1951 census): Dublin (cap.) 522,183; Cork 74,567; Limerick 50,820; Dun Laoghaire 47,920. President in 1956, Sean T.

O'Kelly (Seán T. Ó. Ceallaigh); prime minister, John A. Costello (Seán Ua Coisdealbha).

History.—In 1956 the serious preoccupations of government, opposition and thoughtful sections of the public were economic and social rather than political. A disturbing feature was that as the year 1955 drew to a close there was little evidence of any effort on the part of the public to spend less on imported consumer goods, and the deficit on the international trade account remained. In Jan. 1956 a provisional return of trade showed a heavy deficit, and it was recognized that something was necessary to bring about a better equilibrium. Fortunately the amount of external assets remained substantial but, as the Central bank reports stressed, these reserves could not last indefinitely. In March the government imposed a schedule of special levy duties on a wide range of less-essential imports. Some of these duties were later found to weigh on industries. A duty on newsprint for instance affected not only newspapers but various other interests.

Despite some pessimism outside the government, revenue came in quite satisfactorily and by the end of the first half of 1956 a total of £53,592,000 was raised or £2,488,773 more than in the corresponding period of 1955. On the other hand expenditure was £3,468,324 higher. In the early summer a state loan for £20,000,000 was floated but the response of the public fell short of that amount and underwriters (the banks) had to supply the greater part of the loan. Previously the government-sponsored Electricity Supply board floated a stock loan of £10,000,000 which was oversubscribed.

Emigration was subject to much discussion. In April a special census of population was made to ascertain *inter alia* the incidence of emigration since 1951. A provisional return indicated that the resident population had declined by 65,771 (44,500 males, 21,271 females), and by comparing this figure with the national increase of population (excess of births over deaths) the net emigration was estimated at 200,358 (109,221 males, 91,137 females) or an average of 40,072 per annum. At least 90% of the emigrants went to Great Britain. The rest left chiefly for the United States.

Generally speaking economic development advanced. A large hydroelectric development was completed near Cork. The Lee river was dammed at two points to form reservoirs or lakes covering 3,000 ac. of farm land. Agricultural development continued

KILLARNEY LAKE seen from the ruins of Ross castle, Ireland, a view of part of the famous estate sold in 1956 to a U.S. businessman



and improved production would depend on the balancing of the export-import trade. Tourism ranked second to agricultural produce as a money earner, bringing into Ireland approximately £39,000,000 in 1955.

Much was expected in connection with the establishment of a large oil refinery at Whitegate inside Cork harbour but development of the site required by the company was rather slow.

(D. J. R.)

Education.—(1954) Schools: primary 4,874, pupils 472,536, teachers 3,144; secondary (recognized) 447, pupils 54,019, teachers 4,097; vocational (1953-54) 225 permanent, 621 nonpermanent centres, pupils 89,277. Teachers' training colleges (1953-54) 10, students 1,197. Universities (excluding St. Patrick's college, Maynooth), students (1954-55) 8,338, teaching staff 609.

Finance and Banking.—Monetary unit: (Irish) pound, at par with the pound sterling (=2.80 U.S. dollars). Budget (1955-56 est.): revenue £110,620,000; expenditure £112,720,000; (1956-57 est.) revenue £113,000,000, expenditure £118,791,000. Internal debt (March 1954) £238,000,000; external debt £40,600,000. Currency circulation (Feb. 1955) £50,100,000, (Feb. 1956) £58,700,000. Deposit money (Feb. 1955) £98,000,000, (Feb. 1956) £92,400,000. Gold and foreign exchange (March 1955) U.S. \$579,000,000, (March 1956) U.S. \$489,000,000.

Foreign Trade.—(1955) Imports £204,340,000; exports £110,260,000. Main sources of imports: U.K. 53%; other sterling area 9%; continental E.P.U. (European Payments Union) countries 16%; U.S. and Canada 12%. Main destinations of exports: U.K. 87%; continental E.P.U. 5%; U.S. and Canada 3%.

Transport and Communications.—Roads (1953) 80,600 km. Motor vehicles in use (1954): passenger 122,800, commercial 39,000. Railways (including cross-border systems, 1955): 4,700 km.; freight, ton-km. (1955) 484,800,000. Air transport (1955): passenger-km. 138,600,000; freight, ton-km., 1,178,000. Navigable inland waterways (1953) 800 km. Telephones (Jan. 1955) 109,734. Licensed radio receivers (1954) 428,000.

Agriculture.—Main crops (metric tons, 1955; 1954 in parentheses): wheat 430,000 (497,000); oats 610,000 (483,000); barley 268,000 (170,000); rye 3,000 (3,000); potatoes 2,114,000 (2,284,000); flax fibre (1954) 700, (1955) 2,200. Livestock: (Jan. 1956) cattle 4,069,500; sheep 2,484,400; pigs (Sept. 1955) 805,000; poultry (1954) 16,062,050; horses (Sept. 1954) 313,000; goats (1953) 46,176. Miscellaneous production (metric tons, 1955): milk 2,040,000; beet sugar, raw 92,000; wool 2,000; (1954) pork 89,000; beef and veal 80,000. Fish landings (1954) 8,700 metric tons.

Industry.—Production (1955): coal 198,000 metric tons; cement 682,000 metric tons; electricity 1,532,400,000 kw.hr.; manufactured gas 186,000,000 cu.m. Index of industrial production (1955; 1953=100) 105. Unemployment (1954) 8.1%; (1955) 6.8%; (March 1956) 8.1%.

Iron and Steel. Data presented in the three parts of this article are based on statistics available in Nov. 1956 from the U.S. bureau of mines, except as otherwise noted.

Iron Ore.—Table I gives data on world output of iron ore by countries producing more than 100,000 tons a year. In 1955 Canada more than doubled its 1954 production of iron ore as a result of greatly expanded operations, and Venezuela increased its production by more than 3,000,000 tons. These countries supplied the bulk of the U.S. imports of iron ore in 1955. In the first half of 1956 Canada produced 6,353,760 short tons, Venezuela 5,428,640 and Peru 1,537,760 tons. Iron ore imports for consumption in the U.S. in this period totalled 13,449,726 (Venezuela 6,353,760, Canada 3,757,133 and Peru 1,156,981 tons, or nearly 76% of total U.S. iron ore imports).

Table I.—World Production of Iron Ore

	1950	1951	1952	1953	1954	1955
United States	109,810	130,486	109,669	132,155	87,465	115,368
Canada	3,606	4,680	5,272	6,510	7,361	17,377
Brazil	2,190	2,653	3,355	3,987	3,385	4,575
Chile	3,280	3,585	2,435	2,387	2,192	1,887
Venezuela	218	1,400	2,172	2,531	5,976	9,302
Austria	2,049	2,612	2,924	3,039	2,999	3,128
Czechoslovakia	2,000	2,200	2,600	2,500	2,500	2,900
France	33,089	38,802	44,882	46,790	48,308	55,468
Germany	12,356	14,898	17,919	17,457	16,001	19,052
Great Britain	14,519	16,550	18,180	17,715	17,424	18,116
Netherlands	4,238	6,200	7,986	7,904	6,489	7,942
Spain	2,292	2,633	3,156	3,333	3,213	4,284
Sweden	15,352	16,959	18,683	18,721	16,893	18,873
U.S.S.R.	49,000†	52,900†	55,100†	66,000†	71,000†	79,000†
Czechoslovakia	806	642	745	876	1,225	1,541
India	3,321	4,096	4,397	4,307	4,825	5,115
Japan	1,003	1,287	1,537	1,699	1,798	1,671
Philippines	660	995	1,290	1,343	1,571	1,580
Peru	2,836	3,112	3,408	3,735	3,226	3,964
Morocco, French	356	588	718	561	369	342
Morocco, Spanish	948	1,033	1,030	1,087	1,026	1,139
Portugal Leone	1,306	1,278	1,544	1,532	915	1,491
South Africa	1,311	1,566	1,939	2,173	2,087	2,204
Australia	2,649	2,728	3,006	3,695	3,941	4,001
Total	276,000	324,900	328,400	372,400	337,000	410,200

Table II.—Data on Iron Ore in the United States

	1950	1951	1952	1953	1954*	1955†
Crude ore						
Production	140,828	170,367	143,796	175,406	122,040	159,408
Open-pit	108,492	134,581	112,234	139,149	94,911	128,467
Underground	32,337	35,786	31,563	36,257	27,128	30,941
Shipments	141,010	170,330	143,796	175,406	120,831	161,558
To consumers	78,885	95,196	78,793	91,562	54,167	77,349
To concentrators	62,125	75,134	65,003	83,844	66,665	84,210
Usable ore						
Production	109,496	130,485	109,668	132,154	87,465	115,367
Shipped direct	78,746	95,516	78,802	92,024	54,996	74,752
Concentrated	25,548	28,794	24,862	32,661	25,917	32,623
Sintered	4,872	5,539	5,509	6,778	6,552	7,992
Haematite	97,615	113,715	93,537	114,860	74,348	104,117
Brown ore	2,929	3,377	3,057	2,507	2,557	2,757
Magnetite	8,621	12,757	12,397	14,096	9,624	7,336
Shipments	109,496	130,178	109,729	131,961	86,148	119,030
Imports	9,220	11,356	10,932	12,403	15,792	26,275
Algeria	545	500	74	24	33	23
Brazil	775	1,162	1,132	513	667	1,131
British West Africa	215	286	244	259	281	896
Canada	2,082	2,197	2,041	2,062	3,960	11,281
Chile	2,875	3,099	2,085	2,647	1,864	1,186
Liberia	—	123	641	796	857	989
Mexico	214	190	162	271	158	197
Peru	—	—	—	946	2,163	1,741
Sweden	2,282	2,825	2,364	2,349	1,544	1,368
Venezuela	—	711	2,067	2,184	5,210	7,995
Exports	2,845	4,488	5,737	4,762	3,523	5,059
Consumption	119,404	128,618	112,717	136,780	113,258	145,609

*Revised and completed. †Preliminary.

Output of iron ore in the United States rose from 87,465,000 short tons in 1954 to 115,368,000 tons in 1955 of which the Lake Superior district provided about 79%. In the first half of 1956 iron ore output totalled 50,184,044 tons, 75% of which originated in the Lake Superior area. Of the shipments of iron ore, totalling 46,151,599 tons, 73% was from the Lake Superior area.

The \$190,000,000 taconite processing plant at Silver Bay, Minn., was dedicated in Oct. 1956. When operating at full speed it would supply huge tonnages of crude iron. Bulk samples of Lake Superior taconite were analyzed and classified by metallurgical type in 1955 by the U.S. bureau of mines. These studies were continued into 1956, since full utilization of this ore would require solutions of many complex and difficult processing problems. Taconite is an extremely hard iron ore found in both magnetic and nonmagnetic types. Facilities at magnetic taconite operations were being expanded steadily, eventually to provide 30,000,000 tons of iron ore agglomerates. Dock facilities at Taconite Harbor, Minn., progressed satisfactorily in 1956.

The U.S. bureau of mines announced in mid-1956 that it would speed research on iron. It planned to investigate iron ore deposits in the north-central-western states and conduct laboratory studies to develop methods of beneficiating low-grade ferrous materials in ten western states. Also, further research in beneficiating and agglomerating low-grade red ores and iron-bearing sandstones of southeastern U.S. was to be intensified.

Pig Iron.—World production of pig iron increased in 1955, as shown in Table III. Output in the United States rose to a new high in 1955 (see Table IV) and was 33% greater than in 1954. Nearly all pig iron produced locally is consumed in the U.S.—more than 75% in steelmaking. The leading states that consume most of the iron ore and pig iron for steelmaking are Pennsylvania, Ohio, Indiana and Illinois. Improved use of fuel at furnaces

Table III.—World Production of Pig Iron and Ferroalloys

	1950	1951	1952	1953	1954	1955
(In thousands of short tons)						
Australia	1,472	1,484	1,735	2,064	2,079	2,010
Austria	977	1,159	1,295	1,456	1,493	1,662
Belgium	4,073	5,366	5,280	4,648	5,092	5,872
Canada	2,498	2,919	2,914	3,166	2,327	3,380
Czechoslovakia	2,180†	2,290†	2,570†	3,075†	3,100†	3,310†
Czechoslovakia	8,641	9,753	10,894	9,678	9,855	12,220
France	2,811	2,612	2,811	2,626	2,752	3,174
Saar	1,856	2,612	2,811	14,023	15,228	19,821
Germany	10,811	12,166	14,912	12,516	13,309	13,966
Great Britain	10,822	10,868	12,015	12,516	1,190	2,197
India	1,860	2,043	2,076	1,129	5,237	5,990
Japan	2,534	3,557	3,952	5,129	3,086	3,401
Luxembourg	2,755	3,480	3,391	2,601	2,932	3,439
Poland	1,640†	1,786	2,028	30,200†	33,400†	36,700†
U.S.S.R.	21,500†	24,800†	27,800†	30,200†	33,400†	36,700†
United States	66,371	72,472	63,391	77,201	59,752	79,263
Total	148,000	166,000	168,000	186,000	175,500	211,500

Table IV.—Data on Pig Iron and Ferroalloys in the U.S.

	(In thousands of short tons)						
	1949	1950	1951	1952	1953	1954	1955*
Pig Iron							
Production	53,323	64,500	70,278	61,308	74,853	57,948	76,849
Shipments	52,219	64,626	70,250	61,235	64,163	57,783	77,300
Imports	100	796	1,066	380	590	291	284
Exports	81	7	7	14	19	10	35
Consumption	53,447	64,943	71,414	61,551	74,708	58,662	77,216
Castings	6,939	8,669	9,664	8,059	8,868	7,004	9,259
Open-hearth	41,783	50,946	56,055	49,374	61,077	48,632	63,750
Bessemer	4,612	5,170	5,551	3,999	4,351	2,849	3,933
Electric	108	154	144	119	182	178	274
Ferroalloys							
Production	1,544	1,871	2,194	2,083	2,336	1,805	2,415
Shipments	1,425	1,982	2,207	2,038	2,209	1,703	2,542
Ferromanganese	560	731	796	738	900	800†	1,014†
Spiegeleisen	54	65	77	†	†	†	†
Ferrosilicon	590	795	846	761	773	395§	913§
Others	221	391	488	539	536	308	615

*Preliminary. †Includes also silicomanganese and briquets. ‡Included in "others." §Includes silvery iron also.

lowered the ratio of coke to pig iron equivalent, leading to a saving of 2,900,000 tons of coke in 1955 (see COKE). An even higher output of pig iron was expected in 1956.

Steel.—Table V shows an increase in world production of steel in 1955, to which the United States contributed largely. Details of the U.S. situation are given in Table VI. India planned to increase its 1955 steel capacity of 1,750,000 long tons to 6,000,000 tons in the next few years.

Table V.—World Production of Steel

	(In thousands of short tons)					
	1950	1951	1952	1953	1954	1955
Australia	1,597	1,606	1,839	2,288	2,476	2,460
Austria	1,044	1,133	1,166	1,415	1,822	2,010
Belgium	4,163	5,571	5,585	4,900	5,431	6,403
Canada	3,384	3,569	3,703	4,115	3,195	4,529
Czechoslovakia	3,186‡	3,870‡	4,180‡	4,880‡	5,070‡	5,400‡
France	9,528	10,828	11,941	10,951	11,714	12,632
Soar.	2,092	2,869	3,112	2,959	3,094	3,483
Germany	14,458	14,888	17,423	16,998	19,218	23,519
Hungary	1,155	1,422	1,608	1,701	1,644	1,797
India	1,610	1,680	1,768	1,688	1,887	1,905
Italy	2,604	3,376	3,897	3,858	4,637	5,947
Japan	5,333	7,167	7,703	8,446	8,543	10,371
Luxembourg	2,702	3,392	3,309	2,931	3,117	3,555
Poland	2,772	3,078	3,509	3,973	4,370	4,905
Sweden	1,584	1,658	1,836	1,939	2,028	2,344
U.S.S.R.	29,800‡	34,600‡	38,000‡	42,000‡	45,600‡	50,000‡
United Kingdom	18,248	17,515	18,389	19,723	20,742	22,166
United States	96,836	105,200	93,168	111,610	88,312	117,036
Total	208,500	232,600	233,200	259,000	246,900	296,300

In 1955 the steel industry in the United States reported an output that topped all previous high records. It was more than 34% higher than in 1954 and about 5% over the previous high of 1953.

Capacity for steelmaking in the U.S. increased from 128,360,000 tons in 1955 to 133,459,000 tons in 1956. The operating

Table VI.—Steel Industry in the U.S.

	(In thousands of short tons)				1953	1954	1955
	1950	1951	1952				
Capacity, Dec. 31*	99,393	104,230	108,588		117,547	125,828	128,363
Production	96,836	105,200	93,168		111,610	88,311	117,036
Basic open-hearth	85,662	92,387	82,143		99,828	80,019	104,804
Acid open-hearth	601	779	703		646	308	555
Bessemer	4,535	4,891	3,524		3,856	2,548	3,320
Electric	6,039	7,142	6,798		7,280	5,436	8,357
Shipments	72,232	78,929	68,004		80,152	63,153	84,717
Domestic	69,660	76,165	64,733		77,472	60,619	81,134
Exports	2,566	2,764	3,271		2,680	2,534	3,583

*For 1954 and 1955, included in oxygen converted capacity installed the latter part of 1954.

rate was 93% in 1955, compared with 71% of capacity in 1954. Consumption of ferroalloys also hit a new high record in 1955. (See also FOREIGN INVESTMENTS.) (F. E. H.; B. B. M.)

Iron and Steel Institute, American: see SOCIETIES AND ASSOCIATIONS, U.S.

Irrigation. **United States.**—Sufficiency of irrigation water supplies in the mountain and Pacific states varied widely during 1956. August inventories showed them ranging from normal or better in the Pacific northwest and in California north of the San Joaquin valley, to good in coastal and northern Rocky mountain areas, subnormal on the plains where summer rainfall was inadequate, and very low in the Colorado and Rio Grande basins. In the southwest generally, from Texas to Arizona, stored supplies were low and irrigators had to depend on pumping from wells. In May, ground water levels in key wells observed by the federal geological survey were at record or near-record lows in southern California, Arizona and New Mexico. Levels were below average in most of the south, southwest and midcontinent areas but above average in the northeast and well above average in the northwest. However, only in the far west and the southwest was a definitely continuing decline observed; in most other areas, the survey concluded, nature either had brought or was expected to bring the usable levels back to normal positions, notwithstanding increasing demands of irrigation and other users.

Preliminary reports of the 1954 federal census of agriculture, issued in 1956, disclosed the extent of the recent advances in irrigation, not only in the western states but also throughout the south and east (see Table). In the 17 mountain and Pacific states, the irrigated land in farms increased from 24,270,566 ac. in 1949 to 26,901,747 ac. in 1954, although the number of farms reporting irrigation declined from 281,476 to 279,625. In the three southern states where irrigation had long been practised extensively—Arkansas, Louisiana and Florida—irrigated acreage increased substantially, notably because of the expansion of the rice industry in the first two states and the orchard and trucking industries in Florida. Rice also had much to do with the acreage growth in Missouri and Mississippi, but in those states as in others, truck orchards and pastures relied increasingly on irrigation, mostly from wells, for moisture in critically dry periods. The over-all increase in number of irrigated farms in the 48 states was from 305,059 to 319,965; irrigated acres increased from 25,787,442 to 29,484,059. The leading state was California, with 7,048,792 ac. despite a decline in the number of irrigated farms; Texas was second, with 4,706,017 ac. and an increased number of farms.

Conditions favouring the expansion shown in the table continued in 1956, with the federal bureau of reclamation still the principal large-scale construction agency. In its 1956 fiscal year the bureau added facilities to serve 203,000 ac. with new or supplemental water supplies and provided 120,000 kw. of hydroelectric generating capacity in multipurpose dams. With these completions the agency increased by about \$145,000,000 its \$2,600,000,000 investment in western reclamation and became



IRON AND STEEL EXHIBIT opened in the Arts and Industries building of the Smithsonian Institution, Washington, D.C., in Jan. 1956. The exhibit was a gift of the Bethlehem Steel company

responsible for the over-all supervision of facilities capable of delivering water to about 7,500,000 ac., or more than one-fourth of the total irrigated area of the western states. Crops harvested on the projects in 1955 were valued at \$827,700,000. Plans for further expansion in fiscal 1957 were to be financed with \$144,255,000 of new funds and a carry-over of \$29,000,000. The bureau started construction of 11 new projects, including the comprehensive Colorado river storage enterprise, approval of which was granted after long consideration by congress. Completion of this, the largest reclamation project in point of dollar authorization (\$760,000,000) was expected to take several decades. Irrigation water for more than 366,000 ac., installed hydroelectric capacity of 1,000,000 kw., and other benefits were contemplated.

Construction of four storage units and 11 participating projects in Colorado, New Mexico, Utah and Wyoming was authorized, and feasibility investigations were ordered for 25 associated projects. Largest of the proposed storage units was Glen canyon dam and reservoir with capacity of 26,000,000 ac.-ft. The concrete dam would rise approximately 700 ft. above river bedrock about 13 mi. south of the Utah-Arizona boundary, where a power plant with installed capacity of 800,000 kw. would be built. Flaming gorge reservoir, on Green river in Utah, would have a storage capacity of almost 4,000,000 ac.-ft., created by a dam 600 ft. high. The power plant would have an installed capacity of 1,000 kw. The two other storage units, of smaller capacities, were to be built on San Juan river in New Mexico and Gunnison river in Colorado.

Acceleration of the irrigation expansion in eastern and south-



PLASTIC IRRIGATION PIPE easily rolled and carried to various parts of a field, a polyvinyl chloride hose weighing 58 lb. per 100 ft. developed by Trinity Products, Inc., in 1956. Regularly spaced tubes attached to the main pipe make possible irrigation of crops by rows

Irrigation in the United States, 1954 and 1949				
State	Farms reporting irrigation		Irrigated land in farms (acres)	
	1954	1949	1954	1949
Western states				
Arizona	6,679	7,822	1,168,165	963,560
California	84,476	90,755	7,048,792	6,438,324
Colorado	23,354	27,121	2,202,921	2,872,348
Idaho	28,204	29,413	2,324,120	2,137,237
Kansas	2,736	1,166	331,551	138,686
Montana	13,114	13,457	1,890,722	1,716,792
Nebraska	12,503	9,680	1,171,623	876,259
Nevada	2,509	2,719	567,069	727,498
New Mexico	11,686	12,691	645,730	655,287
North Dakota	413	304	44,540	35,294
Oklahoma	1,621	466	107,981	34,071
Oregon	19,827	17,663	1,490,397	1,306,810
South Dakota	923	807	90,471	78,069
Texas	26,318	21,427	4,706,017	3,131,534
Utah	19,406	21,126	1,072,682	1,137,995
Washington	18,727	16,928	777,834	589,035
Wyoming	7,129	7,831	1,261,132	1,431,767
Subtotal, 17 states	279,625	281,476	26,901,747	24,270,566
Eastern states				
Arkansas	6,213	3,060	857,930	422,107
Florida	5,799	6,075	428,392	365,421
Louisiana	6,898	7,438	706,627	576,775
Subtotal, 3 states	18,910	16,573	1,992,949	1,364,303
Central and southern states				
Alabama	452	34	16,658	560
Connecticut	405	280	11,975	8,088
Delaware	81	10	5,553	404
Georgia	1,268	139	23,973	3,161
Illinois	266	139	6,789	1,510
Indiana	443	164	11,749	5,339
Iowa	136	76	2,396	1,386
Kentucky	1,226	67	13,434	485
Maine	87	123	1,097	2,299
Maryland	235	30	8,344	697
Massachusetts	1,366	1,053	22,683	18,507
Michigan	1,408	995	23,473	13,901
Minnesota	347	274	9,207	4,235
Mississippi	1,703	44	132,490	5,086
Missouri	752	142	32,998	2,089
New Hampshire	61	51	942	622
New Jersey	1,775	1,033	58,912	28,117
New York	1,675	888	59,024	19,248
North Carolina	2,704	96	25,423	2,083
Ohio	847	458	15,679	5,706
Pennsylvania	883	287	17,950	7,251
Rhode Island	43	52	1,009	1,631
South Carolina	748	84	22,983	6,408
Tennessee	1,094	35	22,548	1,012
Vermont	55	22	689	303
Virginia	763	71	21,805	2,817
West Virginia	62	9	1,381	40
Wisconsin	545	354	18,199	9,781
Subtotal, 28 states	21,430	7,010	589,363	152,573
Total, 48 states	319,965	305,059*	29,484,059	25,787,442*

* Totals for 1949 do not include, for District of Columbia, two farms, 13 ac.

ern states continued. In July, a northeastern exploratory conference on water rights legislation, irrigation and small watershed development was called by the New York joint legislative committee on interstate co-operation. The conference was informed that about 70,000 New York farmers were using supplemental irrigation. In attendance were representatives from nine northeastern states. Of concern was the absence of legal safeguards for rights to water without which northeastern farmers were declared hesitant about investing further in irrigation systems. A more dependable right than that afforded by the common law was sought. Many other eastern and southern states were seeking similar legislative protection.

Mexico.—Final control of the lower Rio Grande was expected to be brought about by Anzalduas dam, construction of which was begun under supervision of the international boundary and water commission. Ultimate cost was estimated at \$5,000,000, to be met equally by Mexico and the United States. The site of the dam was 8 mi. south of McAllen, Tex., and downstream from the recently completed Falcón dam. Although the structure was planned for flood control primarily and United States interest was confined to that feature, the Mexican government intended to use it to firm up the diversion of water through Anzalduas canal, the principal artery of a government-built irrigation system designed to complete the agricultural development of 500,000 ac. around Matamoros. (See also DAMS; FLOODS AND FLOOD CONTROL; SOIL CONSERVATION.) (P. A. E.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Irrigation Farming* (1951).

Islam. The year 1956 saw the Moslem world starting off well in its efforts to raise its cultural standards but progress was considerably hindered by the general political unrest. Even so it became more and more conscious of the cultural affinities

that existed between its various component parts, and the radio and press were used extensively to emphasize their importance. In all Moslem countries efforts toward the yearly extinction of illiteracy by voluntary and official means figured prominently. This was particularly true of Jordan and the principality of Kuwait, which spent £7,000,000 on new schools in 1956 and had more than 12,000 scholars in its various schools. In Egypt, which built more than 500 primary schools during the year, it was stated by the minister of education that by 1962 there would be 4,000,000 scholars studying in primary schools. The new University of Assuit, which could not start its academic career in 1955, began to function in 1956.

The period under review gained in importance as a result of the independence of Tunisia and Morocco, where the educational institutes hitherto controlled by the French came under the control of their own nationals. Cultural activities also were stimulated by visits between the heads of some of the Moslem states. The president of the Islamic republic of Pakistan and the king of Iraq visited Turkey; the shah of Iran and the king of Saudi Arabia went on state visits to India and the president of Pakistan visited Afghanistan. Some Moslem countries sent delegations on tours to non-Moslem countries to establish cultural contacts. Turkey, for instance, sent a delegation in October to Latin-American countries where it had no permanent cultural representation.

In February Pakistan convened a conference of its envoys to the middle east. The conference expressed the view that the happy relations existing with the countries of the middle east should be further strengthened by increased commercial and cultural exchanges. The government of Pakistan offered middle eastern countries facilities for the training of their students in Pakistan's educational institutions. The sixth session of the Pakistan History conference held in Karachi in January called upon the Pakistan Historical society to rewrite the history of the period of Moslem supremacy in the subcontinent of India.

A cultural conference of the Arab league countries held its session in February for the first time on the soil of Saudi Arabia under the chairmanship of one of the foremost littérateurs of the Arab world, Taha Husain. A conference of the Arab Men of Letters met in September at Damascus, Syr., to discuss ways and means of keeping the Arabs informed of the new cultural movements in various parts of the Arab world, and the cultural section of the Arab league announced that it would offer prizes for the best books dealing with the problems of regenerating the Arab cultural heritage. The league also decided to open cultural institutions in São Paulo, Braz., Buenos Aires, Arg., Boston, Mass., and Djakarta, Indon., where there were large Arabic-speaking colonies, and a conference of Arab states consisting of the representatives of Jordan, Syria, Iraq, Tunis and Kuwait met in August to co-ordinate the problems affecting the historical monuments in those countries.

(A. Md.)

Isle of Man: see GREAT BRITAIN & NORTHERN IRELAND, UNITED KINGDOM OF.

Israel. A republic, proclaimed on May 14, 1948, Israel is bounded north by Lebanon, east by Syria and Jordan, south by Egypt and west by the Mediterranean. Area: 7,984 sq.mi. Pop.: (Nov. 1948 census) 782,000, including 716,678 Jews; (1956 est.) 1,827,000, including about 1,592,000 Jews. Religion: mainly Jewish but in 1953 there were 127,000 Moslems, 18,000 Druses and 41,000 Christians. Chief towns (pop., 1953 est.): Jerusalem (cap., Israeli part only) 143,500; Jaffa-Tel Aviv 354,500; Haifa 153,500. President of the republic in 1956, Isaac Ben-Zvi; prime minister, David Ben-Gurion.

History.—The year 1956 was dominated by the impact of

world events on Israel. It began with the repercussions to the pronouncement made at the supreme soviet in Moscow on Dec. 29, 1955, by N. S. Khrushchev, the first secretary of the Communist Party of the Soviet Union. "From the first days of its existence the state of Israel has taken a hostile and threatening position towards its neighbours," he said. This new Soviet policy toward Israel was welcomed on New Year's day by the spokesman of the Arab league in Cairo. He told a correspondent that "the Arabs now know that they can count on Russia's moral and material support in their dispute with Israel. The Arabs need no longer forego the opportunity of making use of such support."

It was against this background that the *knesset* met on Jan. 2. David Ben-Gurion, the premier, outlined the government's attitude. He said: "We shall be answerable to our conscience if we do not see with open eyes the danger of attack which is fast approaching from Egypt." The cabinet, he insisted, was strongly opposed to a preventive war. "We prefer peace even to victory in war," he concluded. But in the weeks that followed the emphasis remained more on war than on peace. There was a recurrence of incidents on the Egyptian border. On Jan. 15 King Hussein of Jordan said in a broadcast to the nation that the Arab legion would "soon reconquer Palestine."

However, events outside the country impinged on the apparent drift to war. On Jan. 19 the United Nations Security council by a unanimous vote of its 11 members condemned Israel in strong terms for the retaliatory raid against Syrian positions in which about 50 Syrians were killed and 29 taken prisoner. The Soviet delegate, Arkady Sobolev, had made it clear that the Soviet Union would support a Syrian move to have Israel expelled from the United Nations. But five days later, Dag Hammarskjöld, the UN secretary-general, paid his first visit to Israel. He stayed for 39 hours, had talks with the premier and with Moshe Sharett, the foreign minister, before leaving for an equally brief visit to Cairo.

There later came a momentary relaxation in the drift to war when Ben-Gurion announced that Israel would not proceed for the time being with the project of diverting the Jordan river waters in the demilitarized zone between Israel and Syria. But the relief was only temporary. On Feb. 28 the Israeli ambassador in Washington called on Secretary of State John Foster Dulles for a definite answer to the request for arms from the United States. He did not get it, but the U.S. government did agree to France's selling 12 Mystère jet fighters to Israel.

There followed a period of uncertainty, heightened by the public differences between London and Washington on middle east policy and especially on the evaluation of Col. Gamal Abdel Nasser. On April 5 an Israeli patrol was attacked near the settlement of Kissufim and an artillery duel started. That night Israeli forces shelled Gaza in retaliation.

A new factor of uncertainty developed as it became known that strong personal differences had arisen between the Israeli premier and the foreign minister. On June 4 the Security council passed a British-sponsored resolution from which the desirability of a "mutually agreed solution" to the Palestine problem had been deleted. There was a widespread reaction to this UN step. It was felt that the Sharett policy of moderation had produced no dividends. Two weeks later, on June 17, Sharett formally resigned after having been foreign minister for eight years since May 14, 1948. He was succeeded by Mrs. Golda Myerson, who subsequently changed her name to Meyer or Meir.

Domestic preoccupations continued awhile but by the second week of July there was renewed tension on the Jordan border after a number of incidents. The following week Hammarskjöld paid a second unexpected visit. He spent seven hours alone with Ben-Gurion before going to Cairo. But any hopes of calmer conditions were cancelled out by the Egyptian nationalization of

the Suez canal on July 26. Israel kept itself aloof from the conflict, except for insisting on its right of passage.

During September the question of border security again became acute. Within three days there were three major incidents which resulted in 6 Israeli dead and 20 wounded. Israel now began a series of retaliatory actions against fortified Jordan police posts in the area of the incidents. These culminated on Oct. 10 in an attack on the village and police post of Kalkiliya (Qalqilya); 13 Jordanians and 18 Israelis were killed. Thereupon Jordan appealed to Iraq under the 1947 treaty to send troops into Jordan, but Israel warned it would take such a move by the Iraqis as *casus belli*. Thereupon the British government informed Israel that under these circumstances Great Britain would come to the aid of its ally, Jordan. The night of Oct. 15 was decisive. On the following day the Iraqis announced that they would not enter Jordan.

Also on Oct. 16 Ben-Gurion warned members of the *knesset* that the principal danger was Egypt, not Jordan or Iraq. But at the same time the principal envoys of Israel met in Jerusalem to discuss Israel's position. On Oct. 26 it became evident that Israel had started to mobilize its reserves, and Pres. Dwight D. Eisenhower appealed to Ben-Gurion to take no forcible action.

On Oct. 29 the first Israeli units crossed into the Sinai peninsula at Elath, while three other forces moved on the main Egyptian concentrations at Rafa and Abu Ageila in the north. Three main engagements were fought at Kusseima, Rafa and Abu Ageila, and a fourth of a different kind was fought by an Israeli parachute battalion which had been dropped on the road to Mailia. Israeli army headquarters later announced that all Egyptians in the peninsula had laid down their arms by the morning of Nov. 5. The entire peninsula except for a ten-mile Jordan along the canal had been occupied, as well as the whole of the Gaza strip. (See also SUEZ CANAL CONFLICT.)

On Nov. 7 Ben-Gurion told the *knesset* that Israel would stay out of Sinai and in Gaza until a satisfactory settlement had been reached, but in a dramatic midnight broadcast the following day, he told the nation that all Israeli troops would be withdrawn from Sinai. The future of Gaza he left still open.

Home Front.—The domestic situation developed mainly in the shadow of foreign affairs. Development and new building were devoted to essentials, as the demands of the armed forces increased. Inflationary pressure continued despite severe financial measures against credit expansion; exports remained low and imports were materially reduced. The adverse balance of payments was covered again by income from German reparations and from institutional funds. The hopes of extensive oil fields were not fulfilled though it was hoped that sufficient oil had been tapped to supply Israel with a quarter of its oil requirements. Between May 1955 and May 1956 a total of 42,888 immigrants arrived, while 6,646 Jews left the country. In 1954-55, 23,670 persons emigrated.

(See also RELIGIOUS EDUCATION; UNITED NATIONS.) (J. K.)

Education.—Schools (1954-55): primary 929, pupils 232,205, teachers 1,000; secondary 79, pupils 22,400, teachers 1,250; vocational and agricultural (1953-54) 69, pupils 8,229, teachers 1,028; teacher training colleges 24, students 3,394, teachers 420. Institutions of higher education (1955-56) students 6,500.

Finance and Banking.—Monetary unit: Israeli pound, divided into 1,000 mils with a principal exchange rate of IL 1.80 to the U.S. dollar (other rate, IL 1.50 = U.S. \$1). Budget (1955-56 actual): revenue IL 775,000,000, expenditure IL 778,200,000; (1956-57 est.) balanced at IL 775,000,000; additional receipts for defense fund under Defence Tax law (est.) IL 54,000,000-55,000,000. Currency circulation (Jan. 1955) IL 1,500,000,000, (Jan. 1956) IL 1,777,100,000. Deposit money (Jan. 1955) IL 1,800,000,000, (Jan. 1956) IL 2,240,000,000. Gold and foreign exchange (Jan. 1955) U.S. \$69,000,000, (Jan. 1956) U.S. \$80,500,000.

Foreign Trade.—(1955) Valued at U.S. dollar 0.56 = 1 Israeli pound. Exports IL 585,970,000; imports IL 1,538,690,000. Main sources of imports: U.S. and Canada 30%; U.K. 10%; continental E.P.U. (European Economic Union countries) 36% (mainly Turkey, Finland). Main destinations of exports: U.K. 19%; U.S. and Canada 20%; continental E.P.U. 36%. Main exports: citrus fruits 36%; industrial diamonds 23%.

Transport and Communications.—Motor vehicles in use (1954): passenger

16,085, commercial (including buses) 20,669. Railways (1955): 400 km.; passenger-km. (1954) 200,000,000; freight ton-km. (1955) 140,400,000. Shipping: merchant vessels of 100 gross tons and over (July 1955) 38; total tonnage 122,235. Air transport (1955): passenger-km. 141,432,000; freight ton-km. 3,528,000. Telephones (Jan. 1955) 57,178. Radio receiving sets (1954) 234,274.

Agriculture.—Cereal production (metric tons, 1953-54): wheat 34,000; barley 89,000; oats 13,260. Miscellaneous production (metric tons, 1955; 1954 in parentheses): olives 4,000 (22,000); bananas 17,000 (11,000); (1955): wines 3,843 kl.; figs 6,000; (1954): olive oil 4,000; peanuts 16,660; oranges and tangerines 395,000; grapefruit 62,000; lemons, limes, etc. 13,000. Livestock (1954-55): cattle 79,167; sheep 98,000; goats (1954) 47,000; chickens (1954) 3,659,000. Fish landings (1955) 9,002 metric tons (of which 5,606 metric tons for breeding).

Industry.—Production (metric tons, 1955): salt 20,290; superphosphates 101,309; cement 663,000; electricity 1,258,000,000 kw.hr. Index of production (Dec. 1955; 1954 = 100) 107. New buildings completed (1955) 1,786,800 sq.m. ground area; industrial diamonds (exports, value 1954) IL 5,607,000.

ENCYCLOPEDIA BRITANNICA FILMS.—*Israel* (1955); *Jerusalem—The Holy City* (1951); *Major Religions of the World* (Development and Rituals) (1954); *Planning Our Foreign Policy* (Problems of the Middle East) (1955).

Italian Literature. One of the most striking aspects of post-World War II Italian culture is the literature of protest. Mindful of the moral experiences undergone during the Fascist dictatorship and the war, young writers in particular have felt an impelling need to establish a concrete relationship between culture and labour, to penetrate into and become part of the primitive world of the peasant, to be man and brother among men and brothers in order to become the voice of the underprivileged multitude who have neither the means nor the time to express themselves. And this with the purpose of correcting the squandering of wealth on the one hand and the horrors of poverty on the other, in the firm belief that without the democratic progress of the have-nots there can be no real democratic progress of the nation as a whole.

Following the early trends established by Ignazio Silone, Elio Vittorini and Carlo Levi, writers turned more and more for subject matter to the Italian south with its teeming contemporary humanity still living under primordial conditions.

Ten of the 25 books awarded literary prizes in 1956 dealt with the south and of these 9 were written by southerners. The most conspicuous contribution, E. Vittorini's *Erica e i suoi fratelli. La Garibaldina* (Bompiani), consisted of two short novels composed at a 14-year interval and offering a two-dimensional aspect of his art. The first tells of the moral sacrifice of an abandoned 15-year-old girl for her younger brothers, and the second reports the eventful train conversation in Sicily between a belligerent old "baroness" and a soldier on leave who both develop into symbolic and legendary figures. In *Le parole sono pietre* (Viareggio prize, Einaudi) Carlo Levi gave pictorial and poetical substance to the plight of the population of a Sicilian district terrorized by the mafia while government authorities look with olympian indifference upon hunger, wretchedness and crime. L. Rèpaci won the newly-instituted Crotona prize for a social novel (*Un riccone torna alla sua terra*, Ceschina) which lays bare some of the endemic, unsolved problems that plague the people of Calabria. In a humorous and mordant chronicle of a typical Sicilian provincial town (*Le parrocchie di Regalpetra*, Crotona prize, Laterza), L. Sciascia reveals what a far cry are its civic life and mores from the world of justice, freedom and human reason to which all aspire. S. Strati, a former self-educated Calabrian mason who, with the financial help of an American uncle, became a school teacher, made his literary début with *La Marchesina* (Villa San Giovanni prize, Mondadori), a vigorous and spontaneous picture of the primitive living conditions of his home town stagnating on the margin of national life. Two amusing and dramatic tableaux of the precarious existence of the white-collar class with its privations, pretensions, ambitions and office gossip and politics were storied by C. Montella (*Incendio al catasto*, Vallecchi) and N. Palumbo (*L'impiegato d'imposte*, Deledda prize, Mondadori). The most striking liter-

ary, psycho-sociological monographs on the harsh realities of the southern way of life were *Il cafone all'inferno* (Laterza) by the humanist T. Fiore, which deals with conditions in Apulia, and *Banditi a Partinico* (Laterza), a well-documented first-hand report on the inconceivable poverty, squalor and backwardness of one of Sicily's worst sore spots, by D. Dolci.

The same genuine and deep-seated interest in the lot of those living "on the wrong side of the track" prompted another group of writers to turn for inspiration to other sections of Italy. S. Giannini exposes the trials and tribulations which stalk the plain folk of the Po valley in *Prati di fieno* (Firenze prize, Mondadori), and the problems of the Carrara marble quarriers in *La valle bianca* (Hemingway prize, Mondadori); while L. Bianciardi and C. Cassola in *I minatori della Maremma* (Laterza) probed into the past and present social conditions of the miners in the rapidly developing industrial sections of southern Tuscany. In five dramatic and facetious stories, all of them set in his native Ferrara (*Cinque storie ferraresi*, Strega prize, Einaudi), G. Bassani skilfully linked the individual story of each character with national political events of the last half-century. E. Pea in *Peccati in piazza* (Napoli prize, Sansoni), set forth the absorbing if harrowing experiences of a young Tuscan woman living in an egotistic and narrow-minded milieu who, through sin, finds her own redemption. Focusing not on a primitive southern Italian village but on Rome, capital of Italy and centre of the Roman Catholic church, as her field of investigation, A. Garofalo, in her thought-provoking *Cittadini si e no* (Nuova Italia) gives a fair-minded and accurate appraisal of the staggering major social problems facing Italy today.

A considerable number of major and minor writers concerned themselves with higher and more restricted aspects of modern life. G. Manzini orchestrated on a theme of life and death her romantic, "crepuscolare" love story whose real protagonist is the racking cough, "la sparviera" which, hawklike, preys upon the existence of a tubercular young artist (*La sparviera*, Viareggio prize, Mondadori). A. de Céspedes turned out, if not her best, her most significant novel (*Prima e dopo*, Mondadori) which presents a solution to the dilemma of home or career with its freedom from family bonds and promise of happiness in the world of art, on which were impaled the women characters of her earlier novels. The anguish of the humble as they endeavour to understand the true reasons behind man's actions was the subject of a profound novel (*Il testimone*, Massimo, Milano) by M. Pomilio.

Ten lively and urban stories by N. Tucci based on his personal Italian and American experiences (*Il segreto*, Garzanti) were awarded the Viareggio prize for first works. *Minuetto all'Inferno* (Einaudi) by E. Zolla, a bizarre satirical and allegorical novel which strikes a note against so-called "absolute principles" and "eternal values," also won the first-work Strega prize. A witty and wry commentary on prevailing contemporary life and customs, particularly those of café society gravitating on Via Veneto, was contributed by E. Flaiano in *Diario Notturno* (Bompiani), a collection of ironic, well-limned essays, reflections, anecdotes, *tranches-de-vie* and profiles.

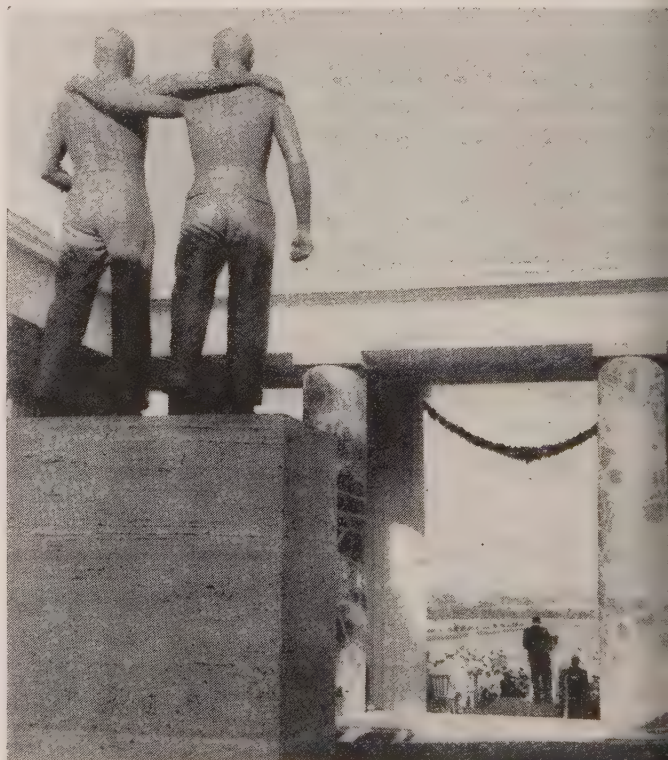
The field of poetry yielded a rich harvest. E. Montale took the Marzotto prize for *La bufera e altro* (Neri Pozza), a collection of austere, grieving poems of consummate metric and rhythmic skill, allusive and elusive in nature, re-evocations of past, present and future swathed in an atmosphere of reality and unreality. L. Sinisgalli, scientist and poet of the hermetic school, in *La vigna vecchia* (Mondadori) transforms his family into household gods and his native Lucania into a legendary land. G. Sbarbaro collected his early poems (*Rimanenze*, Pesce d'Oro, Milano) motivated by an unswerving conviction that life is poverty and sorrow comforted only by bits and splinters of hopes

past. G. Noventa's *Versi e poesie* (Comunità), poems in Venetian dialect in a political and philosophical vein inspired by the contemporary scene, were granted the Viareggio prize. The Salento award went to the philosopher, A. Capitini, for his unconventional lyrics, *Canto corale* (Pacini Mariotti, Pisa) animated by a profound universal religious feeling.

One of the editorial feats of the year was the publication by Laterza of the first two volumes of Benedetto Croce's history of Italian literature (*La letteratura italiana*) edited by Mario Sansone, which consists of a careful selection of Croce's literary and historical essays on each literary period and figure of importance. (M. F. C.)

Italy. A republic of southern Europe, Italy is bounded on land northwest by France, north by Switzerland and Austria and northeast by Yugoslavia. The country includes the whole of the Apennine peninsula, the large Mediterranean islands of Sicily and Sardinia and a number of smaller islands. Area: 116,294 sq.mi. Pop.: (1951 census) 47,218,534; (1956 est.) 48,951,000. Language: mainly Italian, but in Venezia Tridentina there were about 210,000 German-speaking Tyrolese and about 10,000 speaking Rhaeto-Romance dialects; in the area east of Udine there were about 11,200 Slovenes and the population of Val d'Aosta (about 6,600) was French-speaking. Religion: mainly Roman Catholic (99.6%). Chief towns (pop., 1951 census): Rome (cap.) 1,555,773; Milan 1,260,609; Naples 887,327; Turin 717,245; Genoa 648,078; Palermo 434,502; Florence 342,300; Bologna 316,074; Venice 174,632; Catania 294,199; Bari 250,189; Messina 168,497; 13 towns with a pop. of from 100,000 to 200,000. President in 1956, Giovanni Gronchi; prime minister, Antonio Segni.

History.—The political history of Italy during 1956 was dominated by the problem of Pietro Nenni, the leader of that branch of the Italian Socialist party which had remained in alliance with the Communists. On May 27 both provincial and communal elections were held all over Italy according to a changed elec-



"THE BUDDIES," a bronze monument erected as a memorial to U.S. servicemen who fought at Anzio, It., during World War II. The monument is located in the centre of a cemetery, inaugurated in 1956, in which more than 7,000 U.S. servicemen are buried

oral law which abolished the system by which groups of parties had gained extra seats on administrative bodies if they were supported by more than 50% of the voters. This bonus plan, although more practical than strict proportional representation, had outraged the Italian sense of justice. Hence proportional representation was restored for the communes of more than 10,000 inhabitants, while for the smaller ones the straight majority system was adopted. At the same time, and by agreement with the smaller parties within the government coalition, the same principles were established for the next general election to be held in 1958, the senate finally passing the necessary law on May 8.

The changed system of voting made the local elections on May 27 more indeterminate than usual. In the provincial elections, approximately 9,300,000 votes went to the Christian Democrats and 8,300,000 to the Communists and the followers of Nenni; about 3,000,000 votes went to the moderate secular parties and 2,600,000 to the Monarchists and neo-Fascists on the right. The Communists lost ground and Nenni gained it; at the same time the Social Democratic followers of Giuseppe Saragat, the deputy premier, and even the conservative Liberal party, made gains, while the extreme right did poorly.

When it came to the setting up of the new municipal administrations a stalemate threatened in nearly all the major towns except Naples where the local shipowner, Achille Lauro, gained an absolute majority for his dissident Monarchist party. Elsewhere it was not until late in the summer that the mayors and city councils could be finally established. In Milan, for instance, Virgilio Ferrari, a Social Democrat, was elected mayor with support from the extreme left; pressure from the right then drove him to resign but he was reinstated early in September. Similarly

Rome the left objected to the new mayor, Umberto Tupini, a Christian Democrat, because he depended upon the support of the extreme right, but after lengthy disputes he too was accepted. In spite of much talk of superimposing administrators nominated by the central government recourse was had to this expedient only in a few smaller communes.

With the Communists, in the shadow of de-Stalinization, declining and both brands of Socialists gaining, the pressure in favour of the reunion of the Socialists strengthened. There was much talk about bringing Nenni back into the democratic fold. The Christian Democratic leaders felt very much concerned. On the one hand the party secretary, Amintore Fanfani, who stood for ending the coalition and trying to govern with a purely Christian Democratic cabinet, disliked the more dangerous competition promised from a reunited Socialist party. On the other hand Guido Gonella, whose views were more conservative, was in favour not only of Socialist reunion but also of Christian Democratic collaboration with Nenni-cum-Saragat because he believed that the extreme left might otherwise prove irresistible in the long run. Even so late as October, when the Christian Democratic party congress was held at Trento, at a time when the U.S.S.R. was in retreat in Poland and for the moment in Hungary, Fanfani and Gonella still disputed along these lines.

After all kinds of feelers had been tried, Nenni and Saragat met to discuss their problem at Pralognan in Savoy on Aug. 26. The chief stumbling block was Nenni's traditional alliance with the Communist leader, Palmiro Togliatti, which he at one moment seemed ready to sacrifice only at the next to announce that his links with the Communist party could never be broken. It was observed that the Communist trade union leader, Giuseppe Vittorio, seemed to favour Socialist reunion at his own party's expense. With the re-emergence of Wladyslaw Gomulka in Poland and with the popular uprising in Hungary in October, Nenni's reaction of approval was found to be directly opposed to Togliatti's pro-Soviet sympathies, but, in condemning the



POLITICAL POKE delivered during a heated session of the Rome, It., city council in 1956 as Umberto Tupini was elected mayor of Rome

Anglo-French attack on Egypt, Togliatti, Nenni and Saragat were all in agreement. In November Togliatti's approval of the Russian occupation of Hungary once again divided his party from that of Nenni.

Economic Position.—Economically the discomfiture of the Communists became increasingly evident as the year passed. The index of industrial production rose from less than 200 (1938 = 100) in 1955 to 207 for the first eight months of 1956. This fact, together with a modest but perceptible rise in the standard of living, combined with the news from the U.S.S.R. to loosen the Communist hold. On Jan. 11, after a long period of dispute, all state employees (about 1,200,000 persons) were promised an increase in their pay; in June it was reckoned that the cost of living had risen by 4.6% as compared with June 1955, but the pay of state employees was up by 6%, that of industrial workers by 6.9%, that of transport workers by 7.1% and of agricultural workers by 5.2%.

On Feb. 2 the large typewriter manufacturer Olivetti of Ivrea offered to reduce hours of work without reducing pay. By the time this promise came into operation in May Fiat had offered the same thing to its employees; after negotiations with the factory committees an agreement was signed on May 22 according to which, from June 4, all Fiat workers were to work two hours less every week for the same pay. In October all the E.N.I. (Ente Nazionale Idrocarburi) factories made even bigger concessions, reducing their hours of work from 48 to 44 hours per week.

It was not surprising in the circumstances that in the elections to the Fiat works committees in March the votes for the Communist-dominated Confederation of Labour fell from 36.7% of the whole to 28.8%; at the same time the vote for the Catholic trade union representatives increased from 40.5% to 47.2% and that for the anti-Communist Socialists from 22.5% to 23.7%. The relatively prosperous Fiat workers had been deserting the Communist leaders for some time, but the Christian and other trade unions increased their support in other factories throughout the year; their representatives were in a stronger position to negotiate with the employers, and this fact, in conjunction with rising production, accounted for the improvement

in working conditions.

In spite of a seasonal improvement in the summer the solid body of 2,000,000 unemployed still remained, but there was a more serious feeling than before that this need not always be so. Although the minister of the budget, Ezio Vanoni, collapsed and died on Feb. 16, the Segni government determined to carry out his ten-year plan. A ministerial committee was set up for this purpose toward the end of July; it consisted of Saragat and the ministers of the treasury, of industry and trade, agriculture, labour and the minister for the south. Vanoni had allowed for an annual increase of 5% in the gross national product, but already in 1955 this increase had reached 7.2% and it rose still further during 1956.

Vanoni's plan was based above all upon the development of southern Italy. By the summer of 1956 the progress made in the "crusade" for the south was outstanding, for instance, in the irrigation and settlement at Metaponto in Lucania, and also in Sicily and Sardinia. The government decided to prolong the life of the Cassa per il Mezzogiorno, the organization through which the south was aided, for a further three years to 1966, and an additional 590,000,000,000 lire were voted for the purpose. The whole position encouraged the International Bank for Reconstruction and Development to agree on Oct. 11 to another loan of \$7,462,800 for the development of southern Italy, making a total of more than \$160,000,000 which had been lent to Italy for this purpose. During 1956 the Italian economy was appreciably helped by a state Swiss loan to the Italian railways on condition that certain improvements should be carried out, and by considerable private borrowing on the Swiss money market. On July 15 it was announced that an Italian group called Impresit, which was backed by Fiat, Falk and other big Italian firms, had obtained the contract to erect the new dam at Kariba in Rhodesia; the value of this contract was estimated at about 60,000,000,000 lire. It proved possible also to increase the export of Italian labour.

The production of methane gas continued to expand; on the other hand the history of Italian oil production during 1956 was unsatisfactory. Pending legislation on the distribution of profits the oil wells were not exploited, and during the summer those discovered in 1955 in the Abruzzi dried up. At last on July 12 the chamber of deputies agreed to a new bill which, while reducing the 60% share which had been intended for the state and its protégé, the E.N.I., still preserved unusual advantages for them both. Until such time as the senate should ratify this bill, the minister for industry and trade, Guido Cortese, issued provisional permits for those who wished to exploit oil wells or prospect for them. Foreign companies remained discontented with this state of affairs on the Italian mainland, whereas Sicilian law provided the Gulf Oil corporation with the facilities normally offered to foreigners; indeed the corporation hoped to bring its production of oil in Sicily up to a level of 800,000 tons a year by the end of 1956. Meanwhile Italian imports of oil and coal continued to increase.

Foreign Policy.—Good relations between Italy and the United States were emphasized by the visit paid by the president of the republic, Giovanni Gronchi, to North America, from Feb. 27 to March 15. From Feb. 6 to 10 the prime minister, Antonio Segni, and foreign minister, Gaetano Martino, visited Bonn, Ger., and the visit was returned by the leaders of the German Federal Republic from July 1 to 6; among the questions discussed was that of stimulating the flow of Italian labour to western Germany.

When Pres. Gamal Abdel Nasser of Egypt repudiated international control of the Suez canal at the end of July, Italy, ranked fourth among the users of the canal in 1955, felt greatly concerned; 90% of Italy's oil imports had come from the middle

east. Since the Italians hoped to maintain friendly relations with the Arab world they behaved with caution, even contemplating some kind of mediation. Toward the end of September their policy was bitterly attacked by the French because they had paid canal dues to Egypt. Later, and particularly after the Anglo-French attack upon Egypt, Italy followed the policy of the United States.

(E. W.)

Education.—Schools (1953-54): primary 41,119, pupils 4,554,422, teachers 176,687; secondary (intermediate) 2,293, pupils 456,513, teachers 38,122; secondary (higher classical and scientific) 982, pupils 172,166, teachers 15,684; vocational 1,971, pupils 440,350, teachers 39,229; teachers training 503, students 100,362. Institutions of higher education (1954-55) (including fine arts and music schools), of which 28 were universities; students 211,100.

Finance and Banking.—Monetary unit: lira (pl. lire), with an exchange rate of 625 lire to the U.S. dollar. Budget: (1955-56 actual) revenue 2,751,537,000,000 lire; expenditure 2,900,880,000,000 lire; (1956-57 est.) revenue 2,671,000,000,000 lire; expenditure 2,990,900,000,000 lire. Public debt (Jan. 1956) 4,499,882,000,000 lire. Currency circulation (Dec. 1954) 1,507,000,000,000 lire, (Dec. 1955) 1,632,000,000,000 lire. Deposit money (Dec. 1954) 2,529,000,000,000 lire, (Dec. 1955) 2,818,000,000,000 lire. Gold and foreign exchange (Dec. 1954) U.S. \$1,041,000,000, (Dec. 1955) U.S. \$1,237,000,000.

Foreign Trade.—(1955) Imports 1,691,164,000,000 lire; exports 1,160,668,000,000 lire. Main sources of imports: continental E.P.U. (European Payments union countries) 38%; U.S. and Canada 16%; U.K. 5%; other sterling area 19%; Latin America 7%. Main destinations of exports: continental E.P.U. 44%; Latin America 10%; U.S. and Canada 9%; U.K. 7%; other sterling area 8%.

Transport and Communications.—Roads (1954) 171,202 km. Motor vehicles in use (1954): passenger 744,299, commercial 329,588. State railways (1954) 16,966 km.; passenger-km. (1955) 22,636,000,000; freight, ton-km. (1955) 14,568,000,000. Shipping: merchant vessels, 100 gross tons and over (July 1955) 1,149; total tonnage 3,910,658. Air transport (1955): 369,132,000 passenger-km.; freight, 8,388,000 ton-km. Telephones (Jan. 1955) 2,036,788. Licensed radio sets (1954) 5,536,000.

Agriculture.—Production (metric tons, 1955; 1954 in parentheses): wheat 9,505,000 (7,251,000); maize 3,194,000 (2,954,000); barley 292,000 (278,000); oats 528,000 (546,000); rye 125,000 (115,000); potatoes 3,398,000 (3,183,000); rice 859,000 (859,000); broad beans 464,000 (534,000); dry beans 144,000 (163,000); tomatoes 1,350,000 (1,534,000); tobacco 58,000 (66,000); olives 1,170,000 (1,720,000); citrus fruit 964,000 (1,005,900); grapes 8,000,000 (8,027,400); hemp 34,100 (41,800); figs 274,000 (335,600); beef 339,600; pork 200,400; lamb (1954) 45,000; cheese 348,000; beet sugar, raw 1,111,000; olive oil (mechanically processed) 180,000; wine (1955 est.) 50,000,000 hl. Livestock (1954): cattle 9,032,600; sheep 9,746,400; pigs 3,744,800; goats 1,797,500; horses 669,300; mules 401,900; asses 724,100.

Industry.—Fuel and power (metric tons, 1955): coal 1,135,200; lignite 416,400; crude oil 204,720; gas (natural) 3,624,000 cu.m., (manufactured) 2,136,000,000 cu.m.; electricity 37,260,000,000 kw.hr. Production (metric tons, 1955): iron ore (50% metal content) 1,382,400; pig iron 1,734,000; crude steel 5,400,000; zinc, smelter 41,760; lead, smelter 41,760; aluminum, smelter 61,440; cement 10,584,000; cotton yarn 147,600; rayon filament yarn 64,200; rayon staple fibre 66,960; nitrogenous fertilizers (1954-55) 311,200; sulphuric acid (1954) 2,936,211; shoes and slippers (1954) 33,465,000 pairs; passenger cars (units 1955) 230,880; commercial vehicles (units 1955) 38,520. Merchant vessels launched (100 gross tons and over, 1955) 167,200 gross tons. New dwelling units completed (1954) 177,432. Unemployment (1955) 9.8%; (1954) 10.0%.

ENCYCLOPÆDIA BRITANNICA FILMS.—Italy (1955); Italy—Peninsula of Contrasts (1952); Pompeii and Vesuvius (1951); Rome — City Eternal (1951); Venice — Queen City of the Adriatic (1951).

Ivory Coast: see FRENCH UNION; FRENCH WEST AFRICA.

Jamaica. Jamaica is a British colony in the Caribbean. Dependencies: Cayman Islands (93 sq.mi., pop., 1955 est., 8,052) and Turks and Caicos Islands (202 sq.mi., pop., 1955 est., 6,315); also Pedro and Morant Cays (2 sq.mi.). Area (colony): 4,411 sq.mi. Pop.: (1943 census) 1,237,063 (77% Negro, 18% mixed, less than 2% white); (mid-1955 est.) 1,550,000. Language: English. Religion: Christian. Chief towns (pop., 1943 census): Kingston (cap.) 109,056 (1955 est., 145,418); Spanish Town 12,007 (1953 est., 12,300); Montego Bay 11,547 (1953 est., 12,000). Governor in 1956, Sir Hugh Foot; chief minister, Norman Manley. Commissioners: A. M. Gerrard (Caymans), E. G. Lewis (Turks).

History.—The most important event of 1956 was the decision that Jamaica would join the British Caribbean federation. The federal capital site commissioners visited Jamaica in August and on Sept. 2 N. W. Manley, chief minister, was elected president of a newly formed Caribbean Federal Labour party. By a minor change in the constitution the official nominated mem-

rs of the legislative council were replaced by unofficial nominees, and a new constitution before the end of the year wasreshadowed by the governor. A bill to raise a £10,000,000 loan for development was passed in August.

Bauxite companies announced plans for extension, running to many millions of pounds, while in agriculture the prospect for sugar was eased by the selling of accumulated surpluses. Banana exports for the year were expected to exceed 12,000,000 lbs. Coffee exports for 1955 constituted a record, and £294,750 was allocated from the Colonial Development and Welfare fund for the expansion of the cocoa industry.

A start was made in building a new hotel near St. Ann's bay and the oldest and best-known hotel, the Casa Blanca in Montego Bay, was transferred to U.S. ownership. Outward migration to the United Kingdom continued, and bills to control travel and employment agencies were passed. (H. D. Hs.)

Education.—*Colony* (1955): Schools, public primary 704, pupils 225,000, teachers 4,400; secondary 28, pupils 8,645, teachers 488; vocational 7, pupils 1,655, teachers 71; teacher-training colleges 4, pupils 355, teachers 11. *University college of the West Indies*, students 453, teaching staff 111. *Dependencies* (1954): Schools, primary 25, pupils 1,900; private second-

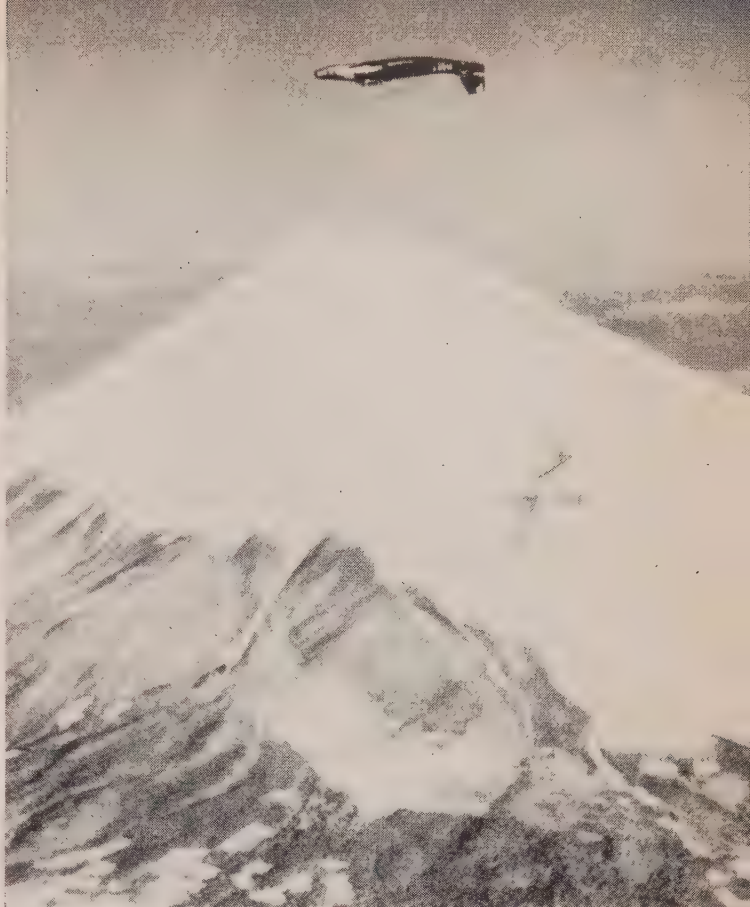
Finance and Trade.—Monetary unit: pound sterling (with local notes). *Assets: Colony* (1954-55): revenue £17,096,245, expenditure £16,866,411. *Dependencies* (1954-55): Cayman, revenue £92,428, expenditure £64,711; Turks and Caicos Islands (1954-55 revised), revenue £84,857, expenditure £89,279. Foreign trade (*colony*, 1955): imports £45,700,000; exports £34,300,000. Principal exports: (*colony*), sugar, bananas, rum, coffee, copra, cocoa, pimento, citrus fruits, ginger, bauxite, alumina; (*dependencies*), turtles, rope, salt, conchs, crawfish. Principal imports: food, ink, tobacco, cotton. Production: (1955) sugar 396,550 metric tons; bananas 13,550,000 stems; rum 1,507,400 gal.

ENCYCLOPÆDIA BRITANNICA FILMS.—*Caribbean* (1955); *Caribbean Skywise* (1955).

Japan. A constitutional monarchy in the northwestern Pacific, Japan is made up of four main islands, Hokkaido, Honshu, Kyushu and Shikoku, with minor adjacent islands (total area, 142,801 sq.mi.; pop., 1950 census, 83,199,637). Population reached an estimated total of 90,017,000 on July 1, 1956. Six largest cities contain 15.9% of the total population (pop., 1950 census, 1956 est. in parentheses): Tokyo, 5,385,071 (urban areas, 6,966,499); Osaka, 1,956,136 (2,547,321); Nagoya, 1,330,635 (1,336,779); Kyotō, 1,101,854 (1,204,017); Yokohama, 951,189 (1,143,287); Kobe, 765,435 (979,290). Principal religions: Buddhism; Shinto. Emperor: Hirohito. Prime minister: 1956: Ichiro Hatoyama until Dec. 20; thereafter Tanzan Ishibashi.

History.—*Foreign Affairs.*—The year 1956 saw the Hatoyama government, spurred by rising strength of opposition parties, striving for greater freedom of action within the framework of Japan's alliance with the U.S. and the free world. The presence even a decreasing number of U.S. forces continued to cause dissatisfaction, to give rise to popular demonstrations, to hamper U.S.-Japanese co-operation and to serve as an obstacle to the Japanese rearmament prerequisite to the withdrawal of U.S. troops. The most serious issue during 1956 concerned continued U.S. requisition for U.S. forces in Okinawa, which was under U.S. occupation. The total amount of land already requisitioned in Okinawa amounted to 42,000 ac., or 12% of the total area. In June, when a U.S. house of representatives subcommittee under Rep. Melvin Price released a report recommending requisition of an additional 12,000 ac. (for the marine corps) and the payment of blanket rents, the issue was brought to a head. In Okinawa a five-man committee representing the legislative assembly, the administrative government, landowners and towns and villages demanded that the U.S. cease the use of land, that adequate compensation be paid for land and for damages resulting from use, and that land no longer needed be promptly turned back to owners.

During 1956 the U.S. continued various efforts to assist Japan in becoming economically self-sufficient and in expanding its



UPSIDE-DOWN OVER MT. FUJIYAMA, a U.S. navy fighter-bomber flying over the Japanese volcano in Aug. 1956

foreign trade. An agreement was signed in Tokyo on Feb. 10 by Foreign Minister Mamoru Shigemitsu and U.S. Ambassador John M. Allison, whereby Japan was to pay \$65,800,000 in yen for surplus agricultural commodities. About 75% of the yen fund was promptly lent back to Japan for development of agriculture, electric power and industrial modernization; the remainder was to be spent in Japan by the U.S.

With regard to its Asian neighbours, Japan made little progress in ameliorating bad relations with South Korea, and only unofficial contacts continued with Communist China, despite continuous pressure by various groups on the government. On May 9 an agreement was reached with the Philippines on reparations and loans, under which Japan agreed to pay the yen equivalent of \$550,000,000 in capital goods and services; an additional agreement provided for the encouragement of private lending from Japan. Meanwhile, reparations payments to Burma during the fiscal year ended March 31 amounted to the equivalent of \$15,700,000.

Following overtures from the Soviet Union and Prime Minister Hatoyama's promise to "normalize" relations with the U.S.S.R., conversations were held in London throughout 1955; by March 1956 they had completely stalled over questions of territory and the repatriation of Japanese prisoners. On July 28, 1956, Foreign Minister Shigemitsu headed a delegation which arrived in Moscow to resume the suspended conversations. He cogently presented the Japanese territorial case: Japan, under the San Francisco treaty, renounced all title to South Sakhalin and the Kuriles (the Russians had refused, however, to sign that treaty, and therefore no beneficiary to these territories had been named); Etorofu, Kunashiri, as well as Shikotan and the Habomais—all off the coast of Hokkaido—were Japan's inherent territory and were never mentioned as part of the Kuriles; finally, these territories should be returned to Japan, following principles laid down in the Atlantic charter, in the Cairo declaration, the Potsdam proclamation and the UN charter, to all of

which the U.S.S.R. had adhered. On the issue of Japanese prisoners of war (the Japanese said they numbered 13,000), Shigemitsu pleaded for a "psychological rapprochement" involving settlement prior to "normalization" of relations.

In reply, Soviet officials flatly refused to discuss the southern Kuriles and offered to return only the Habomais and Shikotan. The Soviet Union applied the "German formula" to the issue of the prisoners (the Russians said they numbered 1,100) and offered to solve the problem only after relations had returned to normal. The entire Japanese press reacted strongly to the Russian refusal, and for a time the negotiations hung in delicate balance. On Sept. 28 Japan and the Soviet Union, sidestepping territorial issues, finally agreed on a formula which would end the state of war and restore diplomatic relations. On Oct. 12 Premier Hatoyama himself arrived in Moscow to arrange the resumption of relations.

Domestic Affairs.—In late 1955, after the merger of left-wing and right-wing Socialists, the coalition of conservative parties into Liberal-Democrats and the installation of the third Hatoyama cabinet, the line-up of lower house seats appeared as follows: Liberal-Democrat, 300 (64%); Socialist, 154 (33%); Farmer-Labour, 4; Communists, 2; minor and vacancies, 7. After the new year recess, the 24th ordinary session of the diet opened on Jan. 26 and from then until the eve of the upper house elections in July handled such important bills as the public office election law, Constitution Research council establishment bill, National Defense council organization law and the new education board bill. All except the constitution bill encountered rough sailing.

Blocked in the previous session of the upper house, the bill for a constitutional review passed the lower house on March 29 and the upper house in the last days before the summer election, and provided for a cabinet council "to carry out a complete examination of the [so-called MacArthur] Constitution of Japan from a national viewpoint." When the council got down to work, these were the changes most often mentioned: conversion of the emperor from the "symbol" to the "chief" of state; re-drafting of article 9, the constitutional bar to full rearmament; clarification of rights and duties of citizens; and re-examination of the role of the upper house.

Both constitutional review and rearmament were dealt severe blows in the upper house elections of July 8, Japan's first national ballot since the recasting of party lines. In the election for half the upper house seats, the results as announced July 10 showed that: the Liberal-Democrats held their own, taking exactly the number of seats previously held, 122; the Socialists gained 12 seats for a total of 80 (68 in previous house); the *Ryokufukai*, usually counted on for government support, lost 12 to total 31 (43); and thus the conservatives did not gain the two-thirds necessary to pass a constitutional amendment (required, two-thirds in both houses and a majority in a national referendum).

In December the Liberal-Democratic party elected Tanzan Ishibashi, minister of international trade and industry, as president of the party to succeed Hatoyama, who was retiring because of failing health. On Dec. 20 Hatoyama and his cabinet resigned, and Ishibashi was elected prime minister by vote of the house of representatives.

Economic Affairs.—Partly as a result of a tight money policy and a trimmed budget, Japan's export prices fell between 1953 and 1955 and exports rose \$800,000,000 (69%); with an expanding world trade and a record rice crop, which cut the level of imports, Japan at the end of 1955 attained its best postwar trade and payments position. Although U.S. special procurement fell off to \$557,000,000 (\$40,000,000 less than 1954), Japan's surplus rose to \$494,000,000 and its foreign exchange reserves

to a new high of \$1,447,000,000 (Dec. 31, 1955). Compared with a dollar gap of \$514,000,000 in 1951 and \$469,000,000 in 1954, the 1955 figure was narrowed to \$103,000,000.

Despite these gains, in 1955 Japan was still spending \$524,000,000 on food, \$492,000,000 on textile raw materials, \$214,000,000 on petroleum and \$192,000,000 on minerals, metals and coal. The foreign exchange budget for fiscal 1956-57 allocated a further increase to about \$3,000,000,000 in imports, from which \$300,000,000 would go for food and \$327,000,000 for textile raw materials.

Education.—In 1954 Japan had 22,036 primary schools, 15,906 secondary schools and 528 colleges and universities, with a total of 20,525,698 students and 725,845 teachers.

Finance.—The monetary unit is the yen, with an official value in 1956 of 360 yen to the U.S. dollar. See Tables I, II and III for budgetary, banking and other financial data. Japan's national income during the calendar year 1955 totalled 6,574,500,000,000 yen (\$18,263,000,000), a rise of 8.4% over the previous year.

Foreign Trade.—Traditionally, Japan built its export drives on textiles which, even in 1955, accounted for 37% of exports. The U.S. absorbed (by value) 22% of the exports, northern Asia (China, Korea, Formosa, Ryu-

Table I.—Japan: Fiscal Year Budgets

(In millions of yen)			
Item	1956-57	1955-56	1954-55
Revenue, general account	1,034,922	991,457	999,588
Expenditure, general account	1,034,922	991,457	999,588

Table II.—Japan: Selected Financial Indicators

Indicators	Dec. 1955	March 1956	June 1956
Bank notes (000,000 yen)	673,890	568,561	596,909
Wholesale price index (1952 average = 100)	97.9	99.3*	101.4
Industrial production index (1934-36 average = 100)	198.0	190.9†	216.4*
Exports (000 U.S. dollars)	249,180	185,703‡	210,742‡
Imports (000 U.S. dollars)	233,345	220,381‡	280,403‡

*Tentative. †Revised. ‡Preliminary customs: excluding special procurement.

Table III.—Japan: Principal Accounts of All Banks

(In millions of yen)			
	May 1955	Feb. 1956	May 1956*
Assets			
Cash	46,800	46,900	51,700
Deposits (other banks)	40,800	47,900	29,800
Loans	2,937,300	3,181,800	3,290,100
Securities	442,300	535,800	596,100
Call loans	30,500	53,300	58,600
Liabilities			
Deposits‡	2,758,900	3,140,000	3,347,800
Debentures	261,300	294,800	306,200
Borrowings	197,300	70,800	54,100
Due Bank of Japan	181,000	20,500	22,100
Call money	72,000	106,500	94,800

*Tentative. †Excluding checks and bills. ‡Excluding checks, bills and deposits in foreign currencies.

Table IV.—Japan: Foreign Trade

(In millions of U.S. dollars)					
Item	1934-36 average*	1950	1953	1954	1955
Exports	906	828	1,275	1,629	2,010
Imports	941	974	2,410	2,399	2,471

*Partly estimated.

Table V.—Japan: Chief Agricultural Products

	Area (In thousand acres)			Production (In thousand bushels)		
	1955*	1954	1953	1955*	1954	1953
Rice (rough)	7,500	7,507	7,367	640,000†	555,284	502,004
Wheat	1,639	1,660	1,693	53,976	55,700	50,500
Barley	1,070	1,105	1,000	52,680	57,920	50,480
Naked barley	1,390	1,400	1,275	46,300	48,575	36,449
Oats	205†	217	215	10,500†	11,230	10,060
Millet	220†	227	245	4,000†	3,650	5,550
Sweet potatoes . . . . .	...	876	894	264,552	213,285	216,091

*Preliminary. †Unofficial.

Table VI.—Japan: Production of Essential Commodities

(Monthly averages)				
Commodity	1954	1955	June 1956	
Coal (000 metric tons)	3,560	3,535	3,915	
Pig iron (000 metric tons)	384	435	477	
Steel (000 metric tons)	466	578	642	
Electrolytic copper (metric tons)	8,874	9,443	11,331	
Zinc (metric tons)	8,489	9,377	11,350	
Aluminum (metric tons)	4,426	4,792	5,603	
Sulphur (metric tons)	15,642	16,868	20,000	
Cement (000 metric tons)	890	880	1,068	
Ammonium sulphate (000 metric tons)	173	177	207	
Raw silk (bale-132 lb.)	21,493	24,123	20,903	
Cotton yarn (000,000 lb.)	85	77	93	
Cotton fabric (000,000 sq. yd.)	265	252	301	
Rayon fabric (000,000 sq. yd.)	55	65	78	

Source: Ministry of International Trade and Industry; raw silk, Ministry of Agriculture and Forestry.

bus) 10%, southern Asia and middle east 32%, Europe 10%, Latin America 9%, others 17%. Food and food products accounted for 29% of exports, textile fibres 24%, coal and petroleum 12%; the U.S. supplied 1% of Japan's imports, northern Asia 8%, southern Asia and middle east 9%, Europe 7%, Latin America 10%, others 15%.

Agriculture.—After two years of poor crops, unusually good weather in the 1955 season produced a bumper rice crop, raising farm income about 5% over the previous year and considerably easing the pressure for food imports.

Manufacturing.—Manufacturing output (1953=100), which had been 115 in 1950, rose to 80 in 1952, to 108 in 1954, to 115 in the second quarter of 1955, to 216 in the fourth quarter of 1955, fell off to 119 in Jan. 1956 and rose to 123 in Feb. 1956. See Table VI for other data. Peak unemployment was 840,000 in March 1955; a low point of 570,000 was reached in Nov.—Dec. 1955. (A. W. Bs.)

ENCYCLOPEDIA BRITANNICA FILMS.—*Japan* (1955); *Japan, 80,000,000 Mouths to Feed* (1954).

Java: see INDONESIA.

Javelin Throw: see TRACK AND FIELD SPORTS.

Jehovah's Witnesses. Jehovah's Witnesses were organized internationally as a society of Christian ministers under the Watch Tower Bible and Tract Society (a U.S. nonprofit corporation) in 1884. Growth of the organization was again the marked feature of 1956 activity. Preaching was expanded into Madagascar and Iran with a new branch office opened in west Berlin to total 160 countries under 100 branches where the membership of 642,929 Christian ministers preached "the kingdom of heaven has come."

Circulation of the *Watchtower* and *Awake!* magazines each showed a gain of more than 25% in 1956, reaching 2,800,000 and 1,000,000 copies respectively. Peak circulation of the *Watchtower* was attained in April with 7,905,688 copies of a special issue distributed in 44 languages.

During 1956 a resolution and petition was addressed to Premier Nikolai A. Bulganin of the U.S.S.R. requesting the release of the 9,000 ministers of the society known to be imprisoned in more than 50 Soviet penal camps. The petition further requested that a delegation be permitted to proceed to Moscow to present additional information about Jehovah's Witnesses and request permission to organize the Witnesses into congregations with responsible ministers, and to publish Bible literature. An incomplete report for the year showed that the resolution was unanimously adopted by 290,298 Witnesses assembled in 72 district conventions throughout North America, the British Isles and northern Europe. (N. H. K.)

Jet Propulsion. Turbojets.—The year 1956 marked the debut of one of the most promising engines in the arsenal of the western democracies, when General Electric's J-79 took to the air in the Lockheed F-104 jet fighter, a aeroplane capable of speeds in the 1,500-1,600-m.p.h. range. The J-79, turning out about 15,000 lb. thrust and slated for further development to higher ratings, was placed on production status in 1956. It was also to be the power plant for the Convair F-105 Hustler, the U.S. air force's first supersonic bomber, which started taxi tests late in 1956.

Pratt & Whitney Aircraft continued development of its J-75 engine, basically rated at 15,000 lb. thrust, and indicated plans to develop it to 18,000 lb. in the near future.

In Great Britain, Bristol Aero-Engines Ltd. announced a new engine in the high-thrust category, the Olympus BO1.6, a split-compressor type turning out 16,000 lb. thrust without aid of afterburner. The de Havilland Engine Co., Ltd., successfully tested its Gyron at the 16,000-lb. mark. Also the Gyron Junior, low-weight, small frontal area engine designed for high supersonic aircraft, and weighing only 1,500 lb., successfully passed thrust-rating tests in the 8,000-11,000-lb. category.

In a different thrust category, two new U.S. engines were announced: General Electric's J-83 and General Electric's J-85, both

rated at about 2,000 lb. Designed for missile application, the major feature of both engines was a very high thrust-to-weight ratio (about 10 to 1).

Pratt & Whitney's J-57 (10,000-13,000 lb. thrust) continued to rank first in production in the United States. Already installed in several aircraft, it seemed to be the most likely engine for use in the commercial jet transports which were being developed. Pratt & Whitney was working on a commercial version of the J-57, rated at 11,000 lb. and known as the JT3C-4. Similarly, the company was developing a commercial J-75, designated JT4A-3 and rated at 15,000 lb. In production as a replacement engine was the old 7,200-lb.-thrust J-48 centrifugal-flow turbojet.

General Electric's production effort, in addition to the J-79, was centred on various versions of the 7,000-to-8,000-lb. J-47 engine, ten years old in 1956 but still in wide service use in the Boeing B-47 jet bomber and the North American F-86 series of fighters. In addition, the company was producing in quantity the 9,000-lb.-thrust J-73 for a late version of the F-86.

Allison division of General Motors Corp. continued to produce the relatively low-powered (4,600 lb. thrust) J-33 turbojet, used in missiles and trainers, and the 10,000-lb.-thrust J-71, used in a navy fighter and an air force bomber.

Westinghouse (Aviation Gas Turbine division) turned out a limited number of its 4,000-lb.-thrust J-46 engine, and also received a contract for an experimental power plant designated XJ-81, about which no data were released.

Wright Aeronautical division of Curtiss-Wright corporation was in production with its J-65 (7,200-7,700 lb. thrust) and continued developing the 15,000-lb. J-67 Olympus.

In Great Britain Bristol was producing two other versions of the Olympus, the Olympus 101, rated at 11,000 lb., and the Olympus 102, rated at 12,000 lb. Bristol was also developing a low-rated engine, the 4,000-lb.-thrust Orpheus, for use in lightweight fighters.

Production at Armstrong Siddeley Motors Ltd. consisted of several versions of the Sapphire, rated from 8,000 to 11,000 lb. thrust, and the low-powered Viper in four versions of from 1,650 to 2,000 lb. thrust. Rolls-Royce Ltd. continued development of its low-powered low-weight Soar Mark 101 (1,800 lb. thrust) and its 13,000-lb. bypass engine, the Conway. In production were six versions of the Avon, rated from 7,000 to 10,000 lb. (with a 10,500-lb. low specific fuel consumption Mark 29 Avon in test status) and the 5,000-lb. Nene.

Although developmental effort concentrated on the Gyron and Gyron Junior, de Havilland was producing two versions of its 5,000-lb.-thrust Ghost, the Mark 103 and Mark 104.

In Canada, Orenda Engines Ltd. was developing an Orenda PS-13 engine, reportedly in the 20,000-lb.-thrust category, and had in production three lesser Orendas rated from 6,500 to 7,200 lb. thrust.

In France, Société Nationale d'Étude et de Construction de Moteurs d'Aviation (SNECMA) was producing its Atar axial-flow jet, top rated at 9,200 lb. without afterburner, and was working on a new lightweight engine, the 3,000-lb.-thrust Vesta. Société Rateau continued development of its 8,800-lb.-thrust axial, the SRA-101, while in Spain Hispano-Suiza pursued its 7,700-lb.-thrust Verdon R450.

Although information about Soviet engines continued to be scarce, one Russian engine, credited to P. F. Zubets (no designation), powered both the Tupolev 104 twin-jet transport plane and the Badger bomber. It revealed a thrust rating of 16,000 lb. in the former and more than 17,000 lb. in the latter, and was in line with the Russian plan of designing high-power single units rather than lower-powered engines in combination.

Turboprops.—In Great Britain the newest engine to make its

appearance in 1956 in the turbine-propeller category was Bristol's B.E.25, a 5,000-h.p. unit in early development and slated for 1959 production. Bristol was also turning out a limited number of the 4,000-h.p. Proteus. Rolls-Royce disclosed the existence of the Tyne, a 4,500-h.p. axial-flow turboprop, and had in production several versions of the Dart, rated from 1,500 to 2,000 h.p.

Armstrong Siddeley was in production with the 1,500-h.p. Mamba and the 3,000-h.p. Double Mamba. D. Napier & Son Ltd., turboprop specialist, developed five versions of its Eland axial-flow turboprop, rated from 3,000 to 4,200-h.p., and continued development of the low-powered Oryx 750-950-h.p. gas generator, and Gazelle, a 1,300-h.p. free turbine for helicopter use.

In the United States Allison division of General Motors placed more and more emphasis on its line of turboprop engines, particularly the T-56, a 3,750-h.p. engine which powered the Lockheed C-130 transport, and the model 501-D13, commercial version of the T-56, planned to be the power plant for Lockheed's turboprop airliner, the Electra. Pratt & Whitney was developing two large turboprops, the 6,000-h.p. PT2G-3 and the 16,000-h.p. T-57.

In lower power categories, General Electric announced development and plans for production of the 1,000-h.p. T-58, designed primarily for helicopter use; and Lycoming division of Avco Manufacturing Corp. was working on an 800-h.p. helicopter engine, the XT-53. Two other helicopter engines under development were the small Boeing T-50 and its commercial counterpart, the 502-10B, rated at 200-275 h.p., and Continental Aviation and Engineering Corp.'s T-51, with several models rated from 280 to 425 h.p.

Miscellaneous.—Although ramjet engines ("flying stovepipes"), which compress air through speed of motion rather than by a mechanical compressor, had been under development for many years, 1956 saw the first order for a production ramjet—a 28-in. supersonic engine for missile use designed and built by Marquardt Aircraft Co. The thrust rating, in turbojet equivalent, was about 10,000 lb.

The 15,000-lb.-thrust Curtiss-Wright XLR-25, first throttleable, double-barrelled rocket engine, demonstrated the capabilities of small-package, high-thrust, liquid-fuel rockets when it powered the Bell X-2 to a new speed record of 1,900 m.p.h. and also drove the same plane to a new altitude mark of 126,000 ft. Unfortunately, the X-2, including the engine, was lost in a crash. In the United States, development of a number of extremely high-thrust rocket engines was under way, but details were withheld because of the secret guided missile programs involved.

The British government announced development of a new rocket engine, the Screamer, a liquid oxygen-paraffin burning engine built by Armstrong Siddeley. Its thrust was 8,000-9,500 lb. depending upon operating altitude. Napier was working on a rocket, the Scorpion NSC.1, a liquid-propellant engine designed for auxiliary thrust for take-off.

No new information was released on the progress of nuclear power plants for aircraft, although both Pratt & Whitney and General Electric were engaged in such projects in the United States. The air force disclosed that it was testing a low-powered reactor of unidentified design in a B-36; the reactor, however, was not the power source for the engines and was being used only for engineering studies of radiation.

(See also AIRCRAFT MANUFACTURE; AVIATION, CIVIL; AVIATION, MILITARY; MUNITIONS.)

(J. J. Hy.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Jet Propulsion* (1952).

Jewels: see DIAMONDS; GEM STONES.

Jewish Literature. Hebrew Literature.—In spite of hardly favourable economic and political conditions, Hebrew literature for the year 1956 again displayed considerable vitality. Numerous works of poetry and prose were published.

A leading Hebrew novelist, Hayim Hazaz, depicted colourfully and with insight the life of Jews in a small Ukrainian town, following the downfall of the czar, in *Daltot Nehoshet* ("Brass Doors"). There appeared *Mivhar Sippurai Dov Kimhi* ("Selected Stories by Dov Kimhi") whose realism is softened by lyricism, while *Kol ha-Adam Aino Kovev* ("All Men Do No Deceive"), by Yakov Horowitz, exemplified more modern story telling. A first novel, *Shaul ve-Yohanna*, by Naomi Frankel, about Jewish life in pre-Hitler Germany, manifested a canny perceptiveness. Somehow related to this was Joseph Arikha's *Tzeadim ba-Esh* ("Steps in the Fire") which described forcefully the tribulations of a Jewish woman in Nazi-occupied Poland and her subsequent life in Israel.

Shelomo Zemah's volume of incisive literary evaluations *Massa u-Vikoret* ("Essays and Criticism") wears its erudition gracefully. Zevi Wayslavsky, in his book *Yehidim Birshut ha-Rabim* ("Individuals in the Public Domain"), discerningly contemplated some sociological aspects of the contemporary scene, while David Canaani approached modern Hebrew authors in *Bainam le-Vain Zemanam* ("Between Them and Their Time") from a Marxian viewpoint.

The achievements of the "Father of Spiritual Zionism," the centennial of whose birth was celebrated in 1956, were reviewed in a comprehensive biography and study, *Ahad ha-Am, Hayav, Poalo ve-Torato* ("Ahad ha-Am, His Life, Work and Teachings") by Aryeh (Leon) Simon and Joseph E. Heller. There appeared the weighty, third, concluding volume of N. H. Tur Sinai's *ha-lashon ve-Hasefer* ("The Language and the Book") which bears on basic, varied problems of Hebrew philology. In a lighter vein were the learned, attractively written disquisitions by Dov Sdan, *Avnai Sefa* ("Touchstones of Language"). The publication of revealing letters by the national Hebrew poet to his wife, entitled *Igrot H. N. Bialik le-Ishto Manyu*, confirmed his warm-hearted humanity. Named after him, the national Hebrew publishing house Mosad Bialik marked its 20th anniversary.

A work of surpassing significance was Yigael Yadin's publication, with notes, emendations and commentaries, of *Megilat Milhemet B'nai or Bivnai Hoshekh* ("The Scroll of the War of the Sons of Light Against the Sons of Darkness"). Part of the Dead Sea Scrolls, it is a manual of military operations, patterned after Roman tactical planning, which aimed at the final victory of God over the forces of Evil.

In poetry, another volume by a leading elder Hebrew poet, Yaakov Cahan, testified to his continued vigour of expression along traditional lines. During the year appeared the selected abstract, yet concretely realized, poems of Sh. Shalom, as well as the collection *be-Ailem Kol* ("With Muted Voice") by Mordecai Temkin, distinguished by straightforwardness and nobility of tone, and Abraham Braudes' "Roots in the Rock," *Shoroshim ba-Sela*, intimate, cleanly wrought poems inspired by Israel. Yitzhak Shalev's verse in *Kol Anot* ("Voice in Song") holds a new note, while *be-Hatzrot Yareah* ("In the Courts of the Moon"), by Yitzhak Ogen, is reflective and pictorial.

The shadow of tragedy is cast upon *Ketavim Aharonim* ("Last Writings") of Yitzhak Katzenelson. The poet was murdered by the Nazis; yet some of his poems, unearthed at war's end, possess a characteristically playful touch. As if complementing this book, were "Songs of Radiant Sadness," *Shirai ha-Etzev ha-Koren* by Shelomo Shenhud, which deal with the heroism of Israeli youth during the war of liberation, and project fresh

agery and inherent hope tinged with resignation.

In the United States, Hebrew literary activity was at a relative standstill. Nevertheless, some volumes deserve attention. *Shvilai ha-Mahashava ve-Hasifrut ha-Ivrit* ("On the Pathways of Hebrew Thought and Letters"), by the prominent literary historian Meyer Waxman, is a selection of diverse, learned essays. Sarah Heller-Wilensky's *Rabbi Yitzhak Arama u-Mishnato* ("The Philosophy of Isaac Arama") is an exhaustive analysis, with reference to Philonic doctrine, of the theories of the renowned mediaeval exegete. *Haye ha-Yehudim be-Italia tikufat ha-Renesans* ("Life of Italian Jewry During the Renaissance") by A. M. Shulvass represents a serious study. Finally to be mentioned is Simon Bernstein's collation of old Lamentations, *Al Naharot Sfarad* ("Upon the Rivers of Spain"), painstakingly reconstructed from the only extant manuscript.

(G. P.)

Yiddish Literature.—Commemoration of the past, so prominent in recent Jewish literature, was still the dominant trend of Yiddish literature in 1956. The "old country," its characters, ideals and values, occupied the most prominent place in Yiddish fiction. Some novelists portrayed traditional Jewish life romantically, as Pinkhos Shteynvaks in *Yidn tsum gedenken* ("Jews Remember"), and Borukh Hager in *Malkhus Khshides* ("The Kingdom of Hasidism"), awarded the S. Stolar prize in Buenos Aires, Arg. Other works, treating the subject realistically but with a great deal of sentiment, included Khayim Grade's *Der mames shabosim* ("The Mother's Sabbaths"), an autobiographical novel, awarded the Louis Lamed prize for Yiddish fiction in 1956.

An approach to the recent past from the point of view of class struggle was attempted in the novels of B. Shlevin, *Di bider Khaykin* ("The Brothers Khaykin"), and L. Olitski, *Yaye Koval*, published respectively in Paris and Warsaw, and written in the tradition of the communist school of "socialistic realism." The contemporary scene was the subject of two novels, *Rebelia* by Itskhok Perlov, describing life in Israel and the clash of the old and the new generations, and *Di shpete yorshim* ("The Late Heirs") by S. Izbán, a novel of American Jewish

Historical novels about Jewish life included *In a nayer velt in a New World*) by S. Apter, a story about the life of the first Jewish settlers in America, and *Georemt mitn vint* ("Arm with the Wind") by M. Shtrigler, a broad panorama of 19th-century Jewish life in Poland.

A few lengthy poetical works also appeared in 1956, among them *Amerike* ("America") by Berish Vaynshteyn, awarded the Bimko prize for poetry. Collections of shorter poems included from Zak's *Fun ale navenadn* ("From all my Wanderings"), an expression of loneliness of a Jewish poet lost in a strange world. Contributions to the history of Jewish settlements were made by L. Feldman in his book *Yidn in Johannesburg* ("Jews in Johannesburg"), and by M. Kahan in *Yidn in der antshteyung in Brazil* ("Jews in the Origins of Brazil"). *Fun kheyder un shools biz Tsisho* ("From the Traditional Heder and Russian Schools to Tsisho") by C. S. Kazdan told of the rise and growth of the Yiddishist movement, while the demographic and sociocultural study of Jacob Lestshinsky, *Dos natsionale ponim fun uns yidntum* ("The National Characteristics of the Jews in the Diaspora"), showed the decline of national consciousness among temporary Jews outside Israel.

Among noteworthy books on the Jewish persecutions were M. Twicz's *Oyf arishe papirn* ("With Aryan Identification Papers"), a collection of eye-witness reports of Jews hiding from Nazi persecution, and Eliezer Vizl's *Un di velt hot geshvign and the World Kept Silent*), an account of the destruction of Jews in the Marmarosh province of Hungary.

Continuing the commemorative trend, several biographical works were produced: *Fun beyde zaytn ployt* ("On Both Sides of the Fence") by Max Weinreich; *Di lererin Esther* ("The Teacher Esther") by Jacob Pat; and a two-volume biographical dictionary, *Doyres bundistn* ("Generations of Bundists"), edited by Sholem Hertz. Yiddish literary criticism suffered a heavy loss by the death of its most distinguished representative, S. Niger; nevertheless a number of books and essays on Yiddish writers and letters were produced in 1956. Two publications in the field of literary history may be noted: an anonymous 18th-century comedy *Als der sof iz gut, iz ales gut* ("All Is Well What Ends Well"), edited by L. Fuchs from a newly discovered manuscript, and letters of Morris Rosenfeld, the great Jewish poet of the late 19th century, edited by I. Lifshutz. (D. Az.)

Jewish Religious Life: see JUDAISM; RELIGIOUS EDUCATION.

Jewish Welfare Board, National: see SOCIETIES AND ASSOCIATIONS, U.S.

Jiménez, Juan Ramón (1881–), Spanish poet, was born at Palos de Moguer, on the Atlantic coast of Andalusia, Dec. 24. He was awarded the 1956 Nobel prize for literature, after a life more exclusively devoted to poetry than perhaps any other in the annals of literature. He was taught by Jesuits and later attended the University of Seville. From 1909 to 1916 he lived in the Residencia de Estudiantes in Madrid. In 1916 he married Zenobia Cambrubí Aymar, translator of Rabindranath Tagore; she died of cancer a few days after his prize had been announced.

Jiménez cultivated an extraordinary sensitivity with an aristocratic, almost an imperial, disdain of other expressions of the human personality. Though he lived in several countries (since the Spanish Civil War in the United States and other parts of America), and absorbed the best European, English and American poetry, as much of his writing reveals, the ultimate inspiration always came from within himself. In a new golden age of Spanish poetry the total dedication of Jiménez to creation for the enjoyment of the *inmensa minoría* was a perpetual inspiration, however indirectly later generations imitated his work. Some representative titles are: *Jardines lejanos* (1904); *Olvidanzas* (1907); *Laberinto* (1913); *Platero y yo* (prose, 1914); *Diario de un poeta recién casado* (1917); *Sonetos espirituales* (1917); *Segunda antología poética* (1922); *Unidad* (1925); *Canción* (1936); *Españoles de tres mundos* (1942); *La estación total* (1946); a complete *Obra* was being published in Madrid.

John Simon Guggenheim Memorial Foundation: see SOCIETIES AND ASSOCIATIONS, U.S.

Johnson, Lyndon Baines (1908–), U.S. senator, was born near Stonewall, Tex., on Aug. 27. He took a bachelor's degree from Southwest Texas State Teachers college at San Marcos in 1930 and later (1935) studied law at Georgetown university in Washington, D.C. From 1930 to 1932 he taught in public schools of Houston, Tex., and during the next three years was secretary to Texas Congressman R. M. Kleberg in Washington, D.C. He then was Texas state director of the National Youth administration (1935–37). Johnson was elected as a Democrat to fill a vacancy from the 10th Texas district in the 75th U.S. congress (1937–39) and was re-elected for five successive terms (1939–49), broken only by service as a U.S. naval officer during 1941 and 1942 in Australia and New Zealand. Elected senator from Texas on the Democratic ticket in 1948 for the term 1949–55, he was named chairman of the defense "watchdog" subcommittee of the senate

armed services committee in 1950 and devoted most of his time during his first term to spurring the U.S. defense program. In Jan. 1951 he was elected majority whip of the senate. Re-elected senator in 1954 for the term 1955-61, Johnson continued as senate Democratic leader in the 84th congress until a heart attack suffered July 2, 1955, prevented him from attending the closing weeks of the session. After his re-election in 1954 Johnson pledged his party's co-operation with the Eisenhower administration's program in congress. On June 29, 1955, however, he declared that the Democrats would not "carry out instructions like a bunch of second lieutenants taking orders." He was prominently mentioned for the Democratic presidential nomination in 1956, but disclaimed any ambition for the office. Nevertheless he received 80 votes on the first and only ballot at Chicago, Ill., on Aug. 16 that nominated Adlai E. Stevenson.

Joint Chiefs of Staff: see GOVERNMENT DEPARTMENTS AND BUREAUS, U.S.

Jordan. An Arab kingdom, Jordan is bounded west by Israel, north by Syria, east by Iraq and southeast by Saudi Arabia. Area (including Arab Palestine): 37,264 sq.mi. Pop.: (1952 census), 1,329,174; (1956 est.) 1,471,000, including (1953 est.) 745,786 in west Jordan (Arab Palestine). Capital: Amman, pop. (1954 est.) 202,213. Language: mainly Arabic. Religion: Moslem (chiefly Sunni); Christian, about 8% (mainly Arab-speaking Greek Orthodox). King, Hussein I. Prime ministers in 1956: Ibrahim Hashem (Dec. 21, 1955-Jan. 7, 1956); Samir el-Rifai (Jan. 9-May 20); Said el-Mufti (May 22-Oct. 29); Suleiman Nabulsi (from Oct. 29).

History.—The year 1956 was one of disquiet and instability in Jordan, whether in regard to the internal regime of the country, its orientation between the other Arab countries, its relations with Great Britain or the perennial conflict with Israel. The principal crisis had indeed developed in Dec. 1955 with the attempt made by Great Britain to bring Jordan into membership of the

Baghdad pact. The extreme violence of the opposition to the pact, which was largely inspired by Egypt, compelled King Hussein to reject it, and a new government was formed on Jan. 9 under Samir el-Rifai. An acute state of tension, however, remained, and in March King Hussein summarily dismissed Lieut. Gen. John Bagot Glubb, commander of the Arab legion. The king was persuaded to take this step in deference to nationalist opinion and particularly to the wishes of a group of young Arab officers in the legion, one of whose leaders was the 33-year-old Lieut. Col. Ali Abu Nawar, who had been educated in England.

For some time the gravest uncertainty prevailed about the whole question of Jordan's treaty relations with Great Britain, its receipt of British subsidies and the position of the remaining British officers in the Arab legion. Gradually, however, the situation was clarified and stabilized. Both King Hussein and the prime minister affirmed Jordan's wish to preserve its treaty with Great Britain, to continue to receive the British subsidy and to retain in the Arab legion a number of British officers for training and technical purposes. Great Britain, for its part, declared that it would respect the treaty and continue to pay Jordan the agreed subsidies.

It was thought at the time that Colonel Abu Nawar (promoted major general and appointed commander of the Arab legion on May 24) and his colleagues would follow up Jordan's rejection of the Baghdad pact with a policy of definite alignment with Egypt, Syria and Saudi Arabia. This, however, was not the case. Indeed, after the events of March, the Jordanian pendulum swung back quite markedly toward Iraq, though not toward the Baghdad pact. King Hussein and his cousin King Faisal met during the spring and, more significant still, General Abu Nawar himself paid a cordial visit to Iraq, after which there were repeated staff talks and military exchanges between the two countries. This development reached its peak when a severe Israeli attack was launched against a Jordanian frontier post in September, at the height of the Suez crisis. It was to Iraq that the Jordanians turned, rather than to Egypt or Syria, and plans were suggested for the stationing of Iraqi troops in Jordan to strengthen the country's defenses. (See IRAQ.)

The Israeli attack was the culmination of nearly a year of border tension and clashes between the Jordanians and the Israelis. The United Nations armistice commission pronounced now Israel and now Jordan to be the guilty party in these incidents. However, the Jordanian attacks were for the most part in the nature of sniping and small ambushes, whereas the Israeli raid in September was a full-scale military operation in which heavy weapons were used and about 50 Jordanians killed.

In the second half of October Iraqi troops were on the frontier ready to enter Jordan. Pro-Egyptian and Communist elements in the country staged demonstrations against this move. The Israelis also opposed it with threats of "reserving their freedom of action." Finally it was agreed between the governments of

JORDAN TROOPS, members of the Arab legion, on guard in the Jordan section of Jerusalem in Jan. 1956 after rioting followed the signing of the Baghdad alliance



Jordan and Iraq that the troops should not enter but should remain at the frontier ready to come in if wanted by Jordan.

Elections were held a few days later and resulted in a victory for the parties opposed to Great Britain and in favour of Egypt. A government was formed under Suleiman Nabulsi, which brought Jordan into the unified command agreement concluded earlier in the year between Egypt and Syria.

After the Israeli attack on Egypt on Oct. 29 Iraqi and Syrian troops were called in. On Nov. 20 Jordan decided to abrogate the Anglo-Jordanian treaty and to establish diplomatic relations with the U.S.S.R. and the People's Republic of China.

Economically, Jordan took a step toward integration with Syria when the two countries concluded a customs union in August. They decided to have a common currency, to share customs revenue on the basis of comparative figures in the past, and to abolish passports between the two countries. (E. S. AH.)

Education.—Government schools (1953–54) 964, pupils 180,015, teachers 581. Vocational (1952) 3, pupils 193, teachers 13. Teacher-training 1, students 46.

Finance and Banking.—Monetary unit: Jordan dinar at par with the pound sterling (=U.S. \$2.80). Budget: (1955–56 est.) revenue 17,300,000 dinars, expenditure 17,900,000 dinars; (1956–57 est.) revenue 21,500,000 dinars, expenditure 23,400,000 dinars.

Foreign Trade.—(1955) Imports 27,058,453 dinars, exports 2,868,175 dinars (re-exports 1953, 200,000 dinars). Main sources of imports (1954): U.K. 15.4%; U.S. 9.6%; German Federal Republic 5.5%; France 5%; Syria 0.23%; Lebanon 0.1%. Main destinations of exports (1954): Lebanon 42.5%; Syria 24%; Iraq 14%; Saudi Arabia 2.6%.

Transport and Communications.—All-weather roads (1956) 3,520 km., of which 1,520 km. were asphalted. Motor vehicles in use (Dec. 1954): passenger 3,209, commercial 3,710. Railways (1954) 400 km. Air Transport: Arab Airways and Air Jordan; scheduled routes (1955) 9,222 km. Telephones (Jan. 1955) 9,300. Licensed radio receivers (1954) 14,000.

Agriculture.—Production (metric tons, 1954; 1953 in parentheses): wheat 233,000 (105,000); barley 104,000 (43,000); sorghum 18,000 (16,000); oats (2,000); chick peas 4,000 (3,000); lentils 17,000 (5,000 in 1955); figs 18,500 (61,200); olive oil 15,000 (9,000); maize (1952) 4,000; kersennah (1950) 8,200; tobacco (1948) 400; dry beans (1948–9) 1,000. Livestock (Sept. 1954): cattle 52,000; sheep 364,000; goats 15,000; camels 19,000; horses (1953) 2,576; mules (1953) 7,165; asses (1953) 56,510. Phosphates: exports (1955) 150,621 tons, (1954) 43,495 tons.

ENCYCLOPÆDIA BRITANNICA FILMS.—*The Middle East* (1955); *Planning Our Foreign Policy* (Problems of the Middle East) (1955).

Judaism. American Jewry was agitated during 1956 by the growing discrimination by Arab states against Americans of Jewish faith. This discrimination was manifest in the denial by the Arab states of entry or transit visas to Jews, the boycott of American Jewish businesses and the refusal to permit Jews to hold United States government civilian and military posts in Arab countries.

Protests against tampering with the rights of United States citizens by foreign governments were voiced by the American Jewish congress, American Jewish committee, B'nai B'rith and Jewish War Veterans as well as non-Jewish organizations. These expressions of protest culminated in a unanimous resolution by the United States senate on July 25, which read in part:

Whereas it is a primary principle of our Nation that there shall be no distinction among United States citizens based on their individual religious affiliations and since any attempt by foreign nations to create such distinctions among our citizens in the granting of personal or commercial access or any other rights otherwise available to United States citizens generally is inconsistent with our principles: Now, therefore, be it Resolved, That it is the sense of the Senate that it regards any such distinctions directed against United States citizens as incompatible with relations that should exist among friendly nations, and that in all negotiations between the United States and any foreign state every reasonable effort should be made to maintain this principle.

The 24th World Zionist congress, originally scheduled to meet in Israel in the summer, convened in May to focus world attention on the gravity of the situation created by communist support to Egypt. The congress also reaffirmed the spiritual and cultural ties that bind Diaspora Jewry to Israel, and resolved to intensify religious and educational activities throughout the Jewish world. Nahum Goldmann was elected president of the world Zionist organization, a post that had been kept vacant since the death in 1952 of its former president, Chaim Weizmann. During 1956 considerable progress was made in historical and

archaeological investigations and explorations in the Holy Land. Hebrew university scholars deciphered part of the Book of Lemach, one of seven ancient biblical scrolls discovered by shepherds in a cave near the Dead sea in 1947. It is an Aramaic version of several chapters of the Book of Genesis and includes a detailed description of Sarah's beauty, a narrative of Abraham's "walk through the land in the length of it and in the breadth of it," the story of the war of the Five Kings, and names and places not found in other translations.

Among the more ambitious archaeological enterprises of recent years were the excavations at Hazor in upper Galilee under the direction of Yigal Yadin, former chief of staff of the Israel army. Hazor was one of the largest and most important cities of ancient Palestine. According to the Bible, it played a significant role during the period of the Hebrew conquest and served as one of Solomon's royal cities in the north. Hazor is also mentioned several times in Egyptian sources from the 19th to the 13th centuries B.C.

Excavations by scholars from the Hebrew university and other institutions of higher learning continued in the north at the catacombs of Beth Shearim, where the graves of leading rabbinic personalities of the Talmud were found; the ancient Jewish fortress Masada near the Dead sea; the Negev; and other points of historic interest.

Reports on antiquity studies since the rise of Israel were made at the annual conference of the Israel Exploration society in Oct. 1955. It was attended by biblical scholars and archaeologists, and was addressed by I. ben Zvi, president of Israel and a distinguished historian of oriental Jewish communities.

The Jewish cultural world took note of the 850th anniversary of the death of Rashi (initials of Rabbi Solomon ben Isaac) of Troyes, northern France, whose commentaries on the Bible and the Talmud are still recognized as valuable aids in the study of Judaism. A series of educational programs and publications was also undertaken in observance of the 100th anniversaries of the birth of Louis D. Brandeis, member of the supreme court of the United States and illustrious liberal and Zionist spokesman, and of Ahad Haam (Asher Ginsburg), Hebrew essayist and philosopher of the Jewish Renaissance.

(See also ISRAEL; RELIGIOUS EDUCATION.) (S. M. B.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Israel* (1955); *Jerusalem—The Holy City* (1951); *Major Religions of the World* (Development and Rituals) (1954).

Judo: see WRESTLING.

Jugoslavia: see YUGOSLAVIA.

Jumping: see TRACK AND FIELD SPORTS.

Junior Colleges: see UNIVERSITIES AND COLLEGES.

Justice, U.S. Department of: see GOVERNMENT DEPARTMENTS AND BUREAUS, U.S.

Juvenile Delinquency. The reporting of crime and juvenile delinquency statistics in the United States during 1956 was neither uniform nor complete. In spite of the efforts of the federal children's bureau to secure reliable reports from juvenile courts, they covered no more than 29% of the total child population. The latest reports supplied data from only 585 courts in 29 states, and the highly urban and industrialized states of New York and Massachusetts were not included. Students of delinquency therefore exercised caution in drawing conclusions about trends and volume. In 1952 an estimated 385,000 children, or about 2% of all children in the U.S. aged 10–17, appeared in juvenile courts. By 1956 the total child population had increased by about 22%, yet taking the country as a whole the number of juveniles committed to state institutions for reform or correction decreased about 10%. This information was based on returns from a ques-

tionnaire submitted to every state correctional institution for juveniles in the United States. Boy offenders outnumbered girls five to one, a trend which appeared to hold for 1956.

The majority of delinquencies continued to occur in large urban centres. Delinquent children in rural areas were frequently cared for by relatives or friends, or by a priest or minister, or were under quasi-official supervision by the local police. In the cities, the focus of delinquency had passed from the native-born children of European immigrants to the children of the Mexican, Puerto Rican and Negro minorities. Much of the delinquency still seemed to be related to rejection of minority groups.

Conspicuous among the events of the year was the work of Anna Kross, commissioner of the department of correction of New York city, where a program of education and guidance for adolescents had been set up in all the city prisons dealing with youth. Citizen participation, in the form of friendly visitors, "a friend for every prisoner," was in process of development.

A remarkable experiment in treatment was that of Chief Justice Irving Ben Cooper of New York city. He placed a group of young lawbreakers on probation to a group of "graduates"—former probationers who had successfully solved the problems of rehabilitation. This use of a major principle of group therapy attracted favourable attention from the National Probation and Parole association.

Important trends in the study of motivation and personality research were summarized by Herbert A. Bloch and Frank T. Flynn in their book *Delinquency: The Juvenile Offender in America Today* (1956). It was noteworthy that more importance was now being given, in the study of delinquency, to the inter-human relationships than to the environmental factors.

(See also CHILD LABOUR; CHILD WELFARE.) (M. V. W.)

ENCYCLOPEDIA BRITANNICA FILMS.—*Why Vandalism?* (1955).

Kansas. Located in the geographical centre of the continental United States, Kansas was admitted to the union as the 34th state on Jan. 29, 1861. It is frequently referred to as the "Sunflower state," but it is known also as the "Jayhawker state," a name of mysterious source. The total area of the state is 82,276 sq.mi., of which 82,113 sq.mi. is land. Kansas is the geodetic centre of the North American continent from which point all geodetic surveys are made. Population of the state: (1950 federal census) 1,905,299; (March 1, 1956, est.) 2,077,711. For the three largest cities (Topeka being the state capital) the 1956 population was: Topeka, 85,687; Wichita 240,106; Kansas City, 127,437 (1956 state census). According to the 1950 federal census, Kansas population was 50.3% rural and 49.7% urban.

History.—The principal state officials in 1956 were: Fred Hall, governor; John McCuish, lieutenant governor; Paul R. Shanahan, secretary of state; George Robb, auditor; Adel F. Throckmorton, superintendent of public instruction; Frank Sullivan, commissioner of insurance; John Anderson, Jr., attorney general; Ferdinand Voiland, state printer; Richard T. Fadely, treasurer.

In Jan. 1956 the first budget session of the Kansas legislature convened for a 30-day session. The budget session, the purpose of which is to consider the governor's budget for the ensuing fiscal year, was authorized by a referendum on a constitutional amendment submitted to a vote of the people in the general election of 1954. The budget session was to convene on even-numbered years and the regular session of the legislature would meet in odd-numbered years. Prior to the authorization of the budget session, the legislature had convened each two years and fiscal matters were considered along with other legislation.

During 1956 the Governor's Advisory Committee on Penal and Correctional Institutions, composed of penal and medical

authorities, completed a study of the state's penal system and made recommendations for long-range improvements, including establishment of a state correctional authority and an improved probationary system. An extensive program of improvement in penal facilities already had been under way for many months, anticipating many of the needs to be pointed out in the study.

In 1956 Kansas experienced the worst of four consecutive years of drought. In some areas of the state the shortage of rainfall was the worst on record.

In the Nov. 6 election, Pres. Dwight D. Eisenhower drew about 270,000 more votes in Kansas than his Democratic opponent, Adlai E. Stevenson. Elected to state offices were the following: George Docking, governor; Joseph Henkle, lieutenant governor; Paul R. Shanahan, secretary of state; George Robb, auditor; John Anderson, Jr., attorney general; Richard T. Fadely, treasurer; Adel F. Throckmorton, superintendent of public instruction.

Education.—In Sept. 1956 there were about 425,753 primary and secondary pupils enrolled in Kansas schools. There were 21 four-year colleges and 22 two-year colleges which had a combined enrolment of 42,538 students. The combined enrolment of the four state colleges and one university was 22,731. The populations of the other state institutions were as follows: school for the blind, 104; school for the deaf, 227.

Social Insurance and Assistance, Public Welfare and Related Programs.—The populations of the state's institutions in Sept. 1956 were as follows: state training schools, 2,008; hospitals for tuberculars, 258; children's homes, 80; industrial school for girls, 72; industrial farm for women, 39; mental hospitals, 4,366; state penitentiary, 1,492; reformatory for boys, 435; industrial school for boys, 126.

As of Aug. 1956 there were 62,093 persons receiving public assistance: old-age assistance, 34,423 persons with an average monthly payment of \$64.86; aid to dependent children, 17,711 at an average of \$29.30; general assistance, 4,947, average \$25.43; aid to blind, 721, average \$64.15; aid to disabled, 4,291, average \$66.05.

Communications.—As of June 30, 1956, the total length of primary and secondary county, and township roads in the state of Kansas was 137,000 mi., of which 9,786 mi. were state-maintained. There were 534 mi. of urban state highways. The remainder of the highways were controlled by the respective municipalities. Highway maintenance and construction contracts in 1955 totalled \$43,989,157. Highway building and maintenance contracts let during the first six months of 1956 amounted to \$26,182,879.

Kansas had 8,732 mi. of railroads and there were (according to CAA classifications) 70 public airports, 96 limited airports and 7 military air bases. Cities owned 94 airports in Kansas.

Banking and Finance.—Total state expenditures authorized for the 1957 fiscal year amounted to \$258,127,747, a slight increase over estimated expenditures of \$253,063,113 for fiscal 1956. The amount of sales tax (2%) and compensating tax collected for the fiscal year 1956 was \$51,592,841. The total income tax for the fiscal year 1956 was \$17,207,645. There were (1956) 170 national banks, 430 state banks. Total deposits of all Kansas banks reached a total of \$2,028,543,959 as of Jan. 1, 1956.

Agriculture.—The effect of the most severe year of drought on record was reflected in the state's farm economy. The cumulative 12-month total of cash income from farm marketings for the period ending in July dropped to \$798,275,000, largely because cash farm income each month except July decreased from the level of the preceding year for the 12th consecutive month. The aggregate figure was 13% below the total for the like 12-month period a year earlier.

The number of cattle and calves on Kansas farms decreased 1% to total

Table I.—Principal Crops of Kansas

Crop	Indicated 1956	1955	Average 1945-54
Wheat, bu.	144,600,000	128,385,000	202,873,000
Corn, bu.	35,024,000	34,104,000	61,628,000
Sorghum grain, bu.	23,341,000	33,246,000	30,323,000
Oats, bu.	24,990,000	30,882,000	24,623,000
Barley, bu.	9,350,000	12,728,000	4,769,000
Soybeans, bu.	3,480,000	3,350,000	3,859,000
Hay, tons	2,680,000	3,435,000	3,053,000
Potatoes, bu.	130,000	216,000	287,000
Apples, bu.	50,000	230,000	352,000
Grapes, tons	150	500	1,300

Source: U.S. Department of Agriculture.

Table II.—Principal Manufacturing Industries in Kansas

	All employees 1954	Salaries and wages (in 000s)	Value added by manu- facture 1954 (in 000s)	Value added by manu- facture 1953 (in 000s)
Transportation equipment	49,465	\$226,570	\$365,876	\$335,434
Food and kindred products	23,519	89,675	174,945	172,919
Machinery (except electrical)	8,161	34,833	62,236	...
Printing and publishing	7,855	28,437	54,196	...
Chemicals and allied products	9,353	41,125	108,799	137,118
Fabricated metal products	5,690	24,394	42,492	36,256
Stone, clay and glass products	5,299	20,922	56,001	43,130
Petroleum and coal products	4,311	21,640	50,915	63,093

Source: U.S. Department of Commerce, 1954 Census of Manufactures, preliminary report.

298,000 on Jan. 1, 1956. The number of hogs and pigs increased 3% to 9,000 head. All sheep and lambs decreased 2%. The number of chickens on farms decreased 12%. Horses and mules continued to decline with a 9% decrease from Jan. 1, 1955.

Cash receipts from farm marketings during the first seven months of 1956 were \$411,876,000, down 10.1% from the corresponding period of 1955.

Manufacturing and Industry.—Data on manufacturing industries in Kansas for 1954, based on preliminary reports of the 1954 U.S. census of manufactures which were issued in July 1956, are shown in Table II. (F. H.)

Table III.—Mineral Production of Kansas

(Short tons, except as noted)

Mineral	1953		1954*	
	Quantity	Value	Quantity	Value
Total		\$413,231,000		\$449,587,000†
Crude oil (bbl.)	8,546,000	21,429,000	9,076,000	23,874,000
Gas (cu. ft.)	671,000	750,000	?	?
Coal	1,715,000	7,101,000	1,372,000	5,603,000
Lead	3,000	877,000	4,000	1,105,000
Uranium (cu. ft.)	42,783,000	564,000	37,530,000	593,000
Natural gas (100 cu. ft.)	420,607,000	36,172,000	412,369,000	43,711,000
Petroleum gasoline (100 gal.)	?	?	?	?
Petroleum (bbl.)	114,566,000	308,180,000	119,317,000	335,280,000
Petroleum gases (100 gal.)	?	?	?	?
Iron	905,000	7,481,000	877,000	7,778,000
Sand and gravel	8,728,000	5,668,000	10,422,000	7,194,000
Clay	8,769,000	11,304,000	10,377,000	12,942,000
Lime	16,000	3,568,000	19,000	4,128,000
Other minerals	...	10,137,000	...	9,815,000

*Preliminary. †Total has been adjusted to eliminate duplication in the value of clays and stone. ‡Value included with other minerals.

Source: U.S. Bureau of Mines.

Mineral Production.—Table III shows the tonnage and value of the minerals produced in Kansas in 1953 and 1954 whose value exceeded \$100,000. In 1954, Kansas was fifth among the states in crude petroleum output and eighth in natural gas output. It ranked eighth in the value of its minerals, with 3.22% of the U.S. total.

ENCYCLOPEDIA BRITANNICA FILMS.—*Northwestern States*, 2nd ed. (1956).

Kashmir: see INDIA; PAKISTAN.

Kefauver, Estes (1903–), U.S. senator, was born on July 26 in Madisonville, Tenn. He studied at the University of Tennessee, Knoxville (B.A., 1924), and the Yale university law school (LL.B., 1927), was admitted to the Tennessee bar and practised at Chattanooga before his appointment in 1939 as Tennessee state commissioner of finance and taxation. A few months later he was elected to fill an unexpired term in the U.S. house of representatives. He was re-elected several times and served until 1949, when he took office as U.S. senator from Tennessee. In the senate Kefauver gained national attention during 1951 as chairman of the upper house's crime investigation committee, whose televised hearings drew large audiences of viewers.

Kefauver was a prominent candidate for the Democratic presidential nomination at the 1952 convention at Chicago, Ill., where he led on the first and second ballots before yielding to Adlai E. Stevenson. Re-elected to the senate in Nov. 1954 for his second term, Kefauver became, on both domestic and foreign issues, one of the most vocal Democratic critics of the Eisenhower administration.

Late in 1955 he again set out on an intensive campaign for the Democratic presidential nomination. After winning an upset victory in the Minnesota primary in March 1956 he seemed to be the front-running candidate. However, Adlai E. Stevenson's drive for the nomination gradually gathered momentum and on July 31, 1956, Kefauver (who had exchanged rather bitter oratorical remarks with Stevenson during their respective primary campaigns) withdrew from the race and endorsed Stevenson.

When Stevenson, following his own nomination, declared the vice-presidential nomination at Chicago open to the free choice of the Democratic convention's delegates, Kefauver and Sen. John F. Kennedy of Massachusetts became the principal contenders. Kefauver won on the second ballot in a close contest, 55½ to 589 for Kennedy, but he and Stevenson lost to the Eisenhower-Nixon ticket in the national election of Nov. 6, 1956. They polled 44% of the popular vote, but carried only 7 states.



THE OUTSTRETCHED HAND of Estes Kefauver was the symbol of the senator from Tennessee as he made a whirlwind tour of the U.S., greeting hundreds of persons daily, in an effort to win the Democratic nomination for president in 1956.

Kellogg Foundation: see SOCIETIES AND ASSOCIATIONS, U.S.

Kentucky. An east south-central state of the United States, admitted to the union on June 1, 1792, Kentucky is popularly called the "Blue Grass state." Area: 40,395 sq.mi., of which 531 sq.mi. are water. The population by the 1950 official census was 2,944,806. The foreign-born population was 16,068, of whom 11,022 were in the cities. The capital, Frankfort, had a population of 11,916. The three largest cities were Louisville (369,129), Covington (64,452), and Lexington (55,534). The school census of April 1, 1956, estimated the state population as 3,211,092. As in immediately preceding years, population had shifted from coal mining counties in eastern Kentucky and marginal farming regions to counties along the Ohio river, especially the Louisville and Covington-Newport areas. The U.S. bureau of the census provisional estimate of the state's population as of July 1, 1956, was 3,017,000.

History.—The chief events of the year 1956 related to school support, desegregation and social legislation. The assembly strengthened the minimum foundation program of education by voting at least \$80 per pupil in average daily attendance. This law took the place of the per capita and equalization fund and became effective July 1, 1956. In early August, school districts in all but a score of counties were expected to start desegregation. In mid-September, 29 of 40 Kentucky colleges were desegregated. They were expected to have about seven-eighths of the college students. Of the ten United Mine Workers' hospitals dedicated in June, six are in Kentucky, namely, Harlam, Pikeville, Middlesboro, McDowell, Hazard and Whitesburg. They provide free medical service for member miners and their families and are open to others. Assessments levied on coal mined

support the system.

The repeal of the lien law which gave the state a claim on the recipient's property for the money spent in his support increased the recipients by about 2,000 in August. The legislation of 1956, among other provisions, provided for increased benefits effective in October.

In the Nov. 1956 general election, Kentucky voters gave Pres. Dwight D. Eisenhower 572,000 votes for re-election, as against 476,000 votes to Adlai E. Stevenson. Both senatorships went to Republicans, Thruston B. Morton winning out over the incumbent Earle C. Clements by a narrow margin, and John Sherman Cooper defeating former Gov. Lawrence W. Wetherby in the race for the four years remaining of Alben W. Barkley's term. Two Republicans and six Democrats, all incumbents, were re-elected to the U.S. house of representatives. The highway improvement bond measure of \$100,000,000 won by an overwhelming vote.

The state officers in 1956 were: governor, A. B. Chandler; lieutenant governor, Harry Lee Waterfield; secretary of state, Thelma Stovall; auditor, Mary Louise Foust; attorney general, Jo M. Ferguson; treasurer, Henry H. Carter; superintendent of public instruction, Robert R. Martin; commissioner of agriculture, Ben J. Butler; and clerk, court of appeals, Charles K. O'Connell.

Education.—According to a report from the office of the superintendent of public instruction, public schools in 1955-56 included 3,572 elementary schools, 143 high schools and 353 combined elementary and high schools. Total public-school pupils, grades 1-12, numbered 605,488, and full-time teachers, exclusive of principals, supervisors, helping teachers, etc., numbered 20,189.19. The state per capita fund was \$26,212.500 and the equalization fund was \$8,573,000. Negro high schools (public), grades 8-12, had 11,007 pupils enrolled. The per capita pupil cost, 1955-56, was \$160 for current expenses. In 1955-56 the median annual salary of all 21,361.51 teachers, principals, supervisors and vocational teachers was \$2,500. The new education program with an extra \$20,000,000 for 1956-57 was keeping more teachers in the state, 63% of the 1956 graduates in comparison with 43% in 1955. The reason, of course, was higher salaries, an average of about \$2,900 for teachers with degrees, \$300 to \$800 in excess of 1955 salaries, yet still far below the 1954-55 average of Illinois teachers at approximately \$4,350, Michigan at \$4,300, Indiana at \$4,100, Ohio at \$3,975, and Florida at \$3,725.

Social Insurance and Assistance, Public Welfare and Related Programs.—For the fiscal year 1955-56 the department of economic security provided unemployment insurance benefits of \$25,504,574 to a weekly average of 23,312 persons, of whom veterans averaged 1,828 and federal employees 649. The department of economic security paid out \$39,223,125 in the public assistance program. Old-age assistance to the amount of \$23,539,528 went to a monthly average of 55,129 persons. Aid to 50,700 children in 18,744 families amounted to \$14,325,570. Aid to the needy blind came to \$1,358,027 for a monthly average of 3,054 persons. In calendar 1955 adoption petitions were filed for 997 children as compared with 908 in 1954. On Aug. 31, 1956, the tuberculosis hospitals contained 846 patients. The population of the correctional institutions on June 30, 1956 was: reformatory, 2,299; penitentiary, 1,130; women's prison, 68; houses of reform, boys, 255, girls, 93.

Communication.—As of June 30, 1956, the Kentucky department of highways had under maintenance 18,700 mi. of road. Two public toll and 3 private toll bridges over the Ohio river then served traffic. Road fund receipts for the fiscal year amounted to \$95,784,767.35; expenditures amounted to \$81,249,867.18. On June 30, 1956, the state had registered 768,201 passenger cars, 112,468 commercial trucks, 78,998 farm trucks, and 4,185 motorcycles. Thirty-six airports in 1956 were valued at approximately \$22,886,000. Nineteen railroad companies on Dec. 31, 1955, owned 3,708.6 mi. of line; 5 switching companies increased the mileage to 3,827.41.

Banking and Finance.—National banks in Kentucky, on June 30, 1956, numbered 89 and had total assets of \$789,589,000. On the same date state banks and trust companies numbered 279 and had resources amounting to \$1,220,534,082.10. For fiscal 1955-56 the state's total income, including borrowing of \$4,849,504.30, amounted to \$242,483,021.76 according to preliminary returns. Selected sales and gross receipts taxes amounted to \$87,080,331.13; taxes on motor fuels yielded \$51,121,364.44 of that amount. Income taxes contributed \$42,242,649.98, nearly three-fourths being from individual incomes. Licence and privilege taxes yielded \$22,038,682.10. Property taxes amounted to \$14,388,183.62. Inheritance and estate taxes yielded \$3,254,015.97. Nontax receipts contributed \$67,839,551.59. Federal grants amounted to \$52,039,794.28, including \$31,931,000.96 for welfare and health and \$14,634,443.82 for roads. Alcoholic beverage taxes contributed one-seventh of the \$99,377,813 of general fund revenue. Taxes on cigarettes contributed \$8,347,939.01, or slightly more than the \$8,069,459.08 derived from motor vehicle registration taxes. Of all expenditures, those for welfare, education and roads took about 85% of the 1955-56 budget.

Agriculture.—The number of milk cows on Kentucky farms in June 1956, was estimated at 595,000, 2% above the previous year and about 1% above the 1945-54 average. An estimated lamb crop of 556,000 was 6,000 in excess of the previous year, but 13% below the 1945-54 average. Total farm marketings for the first seven months of 1956 yielded \$210,651,000, a

Table I.—Principal Crops of Kentucky

Crop	Indicated 1956	1955	Average, 1945-54
Corn, all, bu.	83,520,000	79,253,000	76,049,000
Wheat, all, bu.	5,538,000	4,020,000	4,849,000
Oats, bu.	2,673,000	2,610,000	1,989,000
Barley, bu.	3,379,000	2,944,000	1,700,000
Soybeans (for beans), bu.	2,665,000	2,412,000	1,906,000
Hay, all, tons	2,487,000	2,472,000	2,263,000
Potatoes, cwt.	880,000	1,088,000	1,097,000
Potatoes, sweet, cwt.	275,000	324,000	305,000
Tobacco, all types, lb.	363,405,000	351,226,000	445,548,000
Apples, commercial crop, bu.	377,000	60,000	321,000
Peaches, bu.	147,000	20,000	400,000
Pears, bu.	33,000	10,000	90,000

Source: U.S. Department of Agriculture.

Table II.—Principal Industries of Kentucky

	All employees 1954	Salaries and wages 1954 (in 000s)	Value added by manu- facture 1954 (in 000s)	Value added by manu- facture 1953 (in 000s)
Food and kindred products	26,884	\$101,488	\$299,735	\$287,552
Tobacco manufactures	10,409	33,236	164,224	146,776
Textile mill products	2,773	7,268	11,080	*
Apparel and related products	17,128	37,104	56,653	56,436
Lumber and products (except furniture)	8,581	20,378	31,115	37,450
Furniture and fixtures	5,359	17,688	25,257	28,304
Printing and publishing	7,100	30,028	46,611	*
Chemicals and allied products	9,798	46,242	148,659	137,719
Primary metal industries	6,293	29,732	59,752	66,849
Fabricated metal products	12,621	52,482	92,750	73,563
Machinery (except electrical)	13,213	59,825	112,768	127,783
Electrical machinery	9,703	33,420	61,008	55,844

*Withheld because the estimate did not meet publication standards, either on the basis of the associated standard error of estimate or on the basis of a consistency review.
Source: U.S. Department of Commerce, 1954 Census of Manufactures, preliminary report.

decrease of \$33,884,000 from the yield of the corresponding months of the previous year.

Manufactures and Commerce.—Between Jan. 1 and June 30, 1956, 47 new industrial plants began operation or announced plans to locate in Kentucky. In June 1956, nonagricultural employment, exclusive of construction, was about 571,400, a decrease of about 5,300 from the previous month but about 6,300 above June 1955. Employees in government, chemicals, metals, retail trade and the service industries accounted for most of the increase over 1955.

In May 1956, about 120,000 people were employed in the wholesale and retail trade, but the number was down to about 128,400 the next month. That figure was in excess of the previous June. Employment in the whole sale trade in June 1956, was about 27,200 as compared with 28,700 a year earlier. In 1954, 2,720 wholesale establishments were credited with a total trade of \$2,188,582,000. In the retail trade employment had increased from 99,500 to 101,200 during the fiscal year 1955-56. In 1954 the state had 26,472 stores with sales of \$2,201,101,000; food stores numbered 7,430 and had sales of \$527,409,000. (W. W. Js.)

Table III.—Mineral Production of Kentucky

Mineral	1953		1954	
	Quantity	Value	Quantity	Value
Total		\$381,742,000		\$327,528,000*
Clays	711,000	3,118,000	571,000	2,995,000
Coal	65,060,000	302,872,000	56,964,000	236,737,000
Fluorspar	47,000	2,100,000	36,000	1,510,000
Iron, pig	790,000	?	592,000	?
Natural gas (000 cu. ft.)	71,405,000	15,638,000	72,713,000	16,579,000
Natural gasoline (000 gal.)	35,000	2,394,000	28,000	1,552,000
Petroleum (bbl.)	11,518,000	33,520,000	190,000	5,066,000
Petroleum gases (000 gal.)	176,000	4,993,000	13,791,000	40,270,000
Sand and gravel	3,052,000	2,900,000	4,730,000	4,402,000
Stone	7,430,000	9,268,000	10,130,000	13,286,000
Zinc	489	112,000	458	99,000
Other minerals . . . . .	...	4,827,000	...	5,647,000

*Total has been adjusted to eliminate duplication in the value of clays and stone.
†Values for processed materials are not included in the totals.
Source: U.S. Bureau of Mines.

Mineral Production.—Table III shows the tonnage and value of those mineral commodities produced in Kentucky in 1953 and 1954 whose value was \$100,000 or more. In 1954 Kentucky was second among the states in output of ball clay and third in bituminous coal and fluorspar. It ranked 11th in value of mineral output, with 2.35% of the U.S. total.

ENCYCLOPEDIA BRITANNICA FILMS.—*Kentucky* (1955); *Southeastern States*, 2nd ed. (1956).

(1894-), Soviet political leader, was born at Kalinovka, Kursk province, April 17, the son of a coal miner. He joined the Communist party in 1918. In 1929 he was sent to study at the Industrial academy in Moscow, and in 1932 was a secretary of the Moscow city committee of the party. In 1934 he was elected to the central committee of the All-Union Communist party and the following year succeeded L. M. Kaganovich as first secretary of the Moscow regional committee. At the beginning of 1938 he was sent to Kharkov as secretary-general of the Ukrainian Communist party with the task of eradicating all Nationalist Ukrainian



"PCHA—CAPITALISTS! And with us they won't even share atom secrets!" 1956 cartoon by Scott of the London Daily Sketch (Eng.)

tendencies. He was so successful that on March 23, 1939, V. Stalin promoted him full member of the Politburo. During the German occupation of the Ukraine he co-ordinated, as lieutenant general, the guerrilla movement there. After the return of the Soviet army in 1943 he also became chairman of the Ukrainian council of people's commissars in Kiev. In 1949 he was made responsible for enlarging the collective farms (*kolkhozy*) by amalgamation.

Ten days after Stalin's death (March 5, 1953) Khrushchev succeeded G. M. Malenkov as party first secretary and soon turned his attention to the declining agricultural production. In Feb. 1954 he proposed an entirely new remedy; namely that the main source of additional supplies of grain should be new state farms to be set up in Kazakhstan and western Siberia.

On the night of Feb. 24–25, 1956, at a private session of the 20th congress of the Communist Party of the Soviet Union, Khrushchev made a memorable and startling speech. In this session—not published in the U.S.S.R., but revealed on June 4 by the U.S. state department—he bitterly attacked Stalin's cruelty, megalomania and self-glorification, deriding his military capacities and his leadership during World War II. On Sept. 19 Khrushchev arrived in Belgrade, Yugos., eight days later he flew to Sevastopol, with Marshal Tito of Yugoslavia. On Oct. 19, together with three other Soviet leaders, he flew to Warsaw, Poland, returning to Moscow the following day.

Kimpton, Lawrence Alpheus (1910–), chancellor of The University of Chicago, was born on Oct. 7 in Kansas City, Mo. He graduated from Stanford university, Stanford, Calif., in 1931 and took his Ph.D. degree at Cornell university, Ithaca, N.Y., in 1935. That year he was appointed a teacher at Deep Springs school and in 1936 was named dean and director. In the autumn of 1942 Kimpton became dean of the college of liberal arts and professor of mathematics and philosophy at the University of Kansas City. He joined the metallurgical laboratory, atomic bomb project, at the University of Chicago, as associate chief administrative officer in 1943, and shortly thereafter became chief. In 1944 he became dean and professor of philosophy and education at The University of Chicago, and on July 1, 1946, was elected vice-president and dean of faculties. He accepted an appointment as dean of students at Stanford university in 1947, returning to The University of Chicago in 1950 as vice-president in charge of de-

velopment, the position he held when elected chancellor on April 12, 1951.

Kimpton's administrative program advanced notably during the year 1956. The campaign for \$32,700,000 announced in June 1955 produced \$20,300,000 by the end of the first year. Among other objectives, the campaign permitted increases in faculty salaries. In addition, \$6,300,000 was received for support of regular university activities and an estate tentatively estimated at \$15,000,000 was bequeathed the university in the will of Louis Block, of Joliet, Ill. Undergraduate enrolment increased substantially for the third consecutive year. The plan to conserve the university neighbourhood approached the state of construction. Five bids were received by the Chicago Land Clearance commission in September for the \$20,000,000 rebuilding of the 47.3-ac. area in which demolition was largely completed.

(W. V. M.)

Kiwanis International: see SOCIETIES AND ASSOCIATIONS, U.S.

Knights of Columbus: see SOCIETIES AND ASSOCIATIONS, U.S.

Knowland, William Fife (1908–), U.S. senator, was born on June 26 at Alameda, Calif. After taking his bachelor's degree at the University of California, Berkeley, in 1929, he entered the newspaper business, becoming assistant publisher of the *Oakland Tribune* (Calif.) in 1933. He was a member of the California state assembly from 1933 to 1935 and of the state senate from 1935 to 1939; in 1941–42 he was chairman of the executive committee of the Republican national committee. In 1945 Gov. Earl Warren of California appointed him to the U.S. senate to fill the unexpired term of Hiram W. Johnson. He was elected on the Republican ticket in 1946 for the full term 1947–53 and was re-elected in 1952 for the term 1953–59. On Jan. 2, 1953, Knowland was elected Republican policy committee chairman of the U.S. senate. On Aug. 4, 1953, after the death of Robert A. Taft, he became majority leader of the senate.

Knowland's strong views on foreign policy led him into disagreement with the administration and Secretary of State John F. Dulles as, for example, on April 14, 1954, when he criticized Dulles' plan for a southeast Asia security alliance as "weak" and "unrealistic" without the participation of both Nationalist China and South Korea. On July 1, 1954, he declared flatly that if Red China were granted admission to the United Nations he would resign his majority leadership and devote full time to bringing about U.S. withdrawal from the UN.

Following the Democratic victory in the congressional elections of Nov. 1954, Knowland became senate minority leader in the 84th congress when it convened Jan. 5, 1955. He continued to criticize the Eisenhower administration's foreign policy on specific issues, but supported the administration's domestic legislative program almost without reservation. He announced in late 1955 that he would run for the Republican presidential nomination if Pres. Dwight D. Eisenhower delayed his second-term decision unduly. On March 1, 1956—the day after President Eisenhower agreed to run again—he withdrew his candidacy. On July 13 Knowland was appointed a delegate to the UN general assembly session convening in Nov. 1956.

Korea. Korea is a peninsula extending southward from Manchuria and the U.S.S.R., 525 mi. long and from 125 to 200 mi. wide. It is bounded north by the Yalu and Tumen rivers, south by the Straits of Korea, west by the Yellow sea and east by the Sea of Japan. Area: 85,266 sq.mi. Total pop.: (1944 census) 25,120,174; (1955 est.) 28,600,000. Religions: Buddhism, Confucianism, shamanism and a unique eclectic religion, Chondokyo. In 1939 there were about 500,000 Korean Christians.

The country is divided into two parts. In the south is the Republic of Korea, area about 36,152 sq.mi. Pop. (1955 est.) 21,526,000. Chief cities (pop., 1955 est.): Seoul (cap.) 1,520,000; Pusan 840,000; Taegu (1949 est.) 313,705. President of the republic in 1956, Syngman Rhee.

In the north is the Democratic People's Republic of Korea, area about 49,114 sq.mi. Pop. (1955 est.) 6,474,000. Chief city, Pyongyang, pop. (1952 est.) 500,000. Prime minister in 1956, Marshal Kim Il Sung.

History.—On May 31, 1956, the United Nations command informed the Communist command in Korea and the Neutral Nations Supervisory commission that, because of violations of the provisions of the armistice agreement of 1953 by the Communists and because of the obstruction of the tasks of the commission by the Communists and by the Polish and Czech members, the United Nations command was provisionally suspending, during the time that the Communist side continued in default, performance on its part of those provisions of the armistice agreement governing the operations of the commission and the inspection teams. The United Nations command made it clear that it continued to regard the armistice agreement as in force. In June the Neutral Nations Supervisory commission teams in the Republic of Korea withdrew to Panmunjom in the demilitarized zone, and the teams in North Korea returned to Panmunjom.

The army of the Republic of Korea had 650,000 men in 1956, making it the fourth largest in the world. In June 1956 the Chinese Communists were reported to have 300,000 soldiers in North Korea, and the North Koreans were reported to have a somewhat larger number of men under arms.

At the Republic of Korea's third presidential election on May 15, 1956, Syngman Rhee was re-elected as president. His strongest and long-time opponent, P. H. Shinicky, a member of

the house of representatives and candidate of the Democratic party, died ten days before the election. The vice-presidential candidate of the Democratic party, John M. Chang, former ambassador to the U.S., was elected over Syngman Rhee's running mate, Lee Ki Poong, speaker of the house of representatives. The chief constitutional duty of the vice-president is to preside over the upper house of the legislature, the house of councillors. The house of councillors, however, had never been created, and upon taking office on Aug. 15, 1956, Vice-President Chang announced that his first task would be its establishment.

Marshal Kim Il Sung, chairman of the council of ministers of the Democratic People's Republic of Korea, was re-elected chairman of the central committee of the Korean Labour party in April 1956.

Education.—In 1954 there were in the Republic of Korea 3,954 elementary schools with 2,342,065 pupils and 36,353 teachers; 621 middle schools with 324,114 pupils and 6,785 teachers; 398 high schools with 160,266 pupils and 4,401 teachers; 48 colleges with 40,520 pupils and 3,685 teachers; and 18 normal schools with 12,190 pupils and 305 teachers. In 1952, 65% of the population of the Republic of Korea was believed to be literate.

The north Korean regime claimed in 1955 to have 4,800 elementary and junior high schools, 72 technical and other vocational schools and 16 colleges and universities. School enrolment in 1956 was claimed to total 1,942,000 students.

Finance.—The budget of the Republic of Korea for the 18 months ending Dec. 31, 1956, amounted to estimated revenues of 580,100,000,000 hwan and expenditures of 598,500,000,000 hwan. The 1955-56 budget ran for 18 months because of the change made in June 1956 to have the 1957 fiscal year correspond with calendar year 1957.

The official exchange rate, which had been 180 hwan to U.S. \$1 since Dec. 1953, was changed to 500 hwan to U.S. \$1 in Aug. 1955 and remained at that level in 1956. The unofficial free-market rate at the end of June 1956 was 1,040 hwan to U.S. \$1, although it changed to 920 hwan by Oct. 1956. By the end of June 1956 the currency in circulation totalled 58,920,000,000 hwan. The retail price index (1947=100) in the Republic of Korea rose to a peak of 21,087 in May 1956, and still was climbing moderately thereafter. The balance sheet of the Bank of Korea, the central bank of the Republic of Korea, showed assets and liabilities of 243,807,635,000 hwan at the end of May 1956.

The United States government made available to the Republic of Korea during the 1955-56 fiscal year \$327,000,000 in economic assistance.

Trade.—The Republic of Korea's trade deficit continued into 1955. In calendar year 1955, commodity imports, excluding U.S.-UN-financed imports, totalled \$82,500,000 and exports \$17,600,000. In the first seven months of 1956 imports totalled \$27,000,000 and exports \$14,400,000. U.S.-UN-financed imports totalled \$244,000,000 in 1955 and \$50,700,000 during the first three months of 1956. Japan, the U.S. and Hong Kong were the major sources and destinations of South Korea's imports and exports. Chief imports, including aid imports, were raw cotton, fertilizer, coal, petroleum and some manufactured goods and foodstuffs, and chief exports were minerals and marine products.

North Korea's trade continued to be chiefly with Communist China and the Soviet Union. Communist China claimed to have undertaken to contribute about 8,000,000,000 yuan and the Soviet Union 1,000,000,000 roubles in economic assistance for four-year and three-year periods, respectively, beginning in 1954.

Transportation.—In March 1956 there were in operation in the Republic of Korea 2,904 km. of railroad track and 40 km. of streetcar track. As of May 1956, there were 522 locomotives, 11,410 freight cars and 1,097 passenger cars in the Republic of Korea. The railroads handled 2,060,000,000 ton-km. of freight and 3,712,000,000 passenger-km. during 1955. There were an estimated 1,000 km. of railroad track in North Korea.

There are about 21,000 mi. of roads, of which 9,500 mi. are in South Korea. At the end of 1955, the Republic of Korea had 8,103 trucks, 2,953 buses and 6,556 automobiles. Korean National Airlines, Northwest Airlines and Civil Air Transport, a Nationalist China air line, provided domestic and international air service for the Republic of Korea in 1956. In 1956 Korea had a merchant fleet of 7,671 vessels with a gross tonnage of 268,358 tons, of which 237 vessels were more than 100 tons each and had a gross tonnage of 145,922 tons.

Agriculture, Fishing and Forestry.—Agricultural production in the Republic of Korea in the 1955-56 crop year included, in metric tons: rice, 2,315,690; fall grains (millet, corn, oats and buckwheat), 92,180; summer grains (barley, naked barley, wheat and rye), 725,580; pulses, 168,310; potatoes and sweet potatoes, 212,180; fruit, 116,900; and vegetables, 1,185,000. In 1955 the Republic of Korea had 867,000 cattle; 334 milk cows, 17,000 horses; 775 sheep; 38,000 goats; 168,000 rabbits; 1,262,000 pigs; 8,924,000 chickens; and 622,000 ducks. Marine landings in 1955 totalled 257,300 metric tons. Lumber production in the Republic of Korea in 1953 totalled 301,000 cu.m.; firewood production 148,215 metric tons; and charcoal production 15,337 tons. There were reports of food shortages in Communist-held North Korea in 1955 because of cold weather and floods. These reports continued into 1956 as fertilizer, seed and farm manpower were inadequate.

Manufacturing.—Industrial production in the Republic of Korea in 1955 included: cotton yarn, 58,576,000 lb.; cotton cloth, 121,523,000 sq.yd.; woollen yarn, 244,032 lb.; woollen and worsted cloth, 4,153,293 yd.; rayon cloth, 80,514,000 sq.yd.; silk cloth, 1,800,000 sq.yd.; all-rubber shoes, 23,422,000 pairs; paper, 33,017 metric tons; cement, 56,257 metric tons; bicycles, 24,048; and soap, 21,798 metric tons. The Republic of Korea has a state monopoly on salt, tobacco and ginseng. Production in 1955 included, in metric tons: salt, 353,919; cigarettes, 12,605; and cut tobacco, 5,179. Electric power production in 1955 totalled 880,000,000 kw.hr.



FUNERAL PROCESSION in Seoul, Korea, following the death of P. H. Shinicky in May 1956. Shinicky was campaigning for election as president of the Republic of Korea

The North Korean regime announced that it had embarked on a three-year economic plan in Jan. 1954. By the end of 1956, North Korea hoped to be producing 4,000,000 metric tons of coal as compared with 700,000 tons in 1953 and rehabilitation of a 600,000-kw. hydroelectric plant was expected to be completed in 1956. By the end of 1955, 236 factories were reported to have been rehabilitated and 71 new factories established. The five-year People's Economic plan was reported to be scheduled to begin in 1957 with emphasis to be on the development of heavy industry. Unconfirmed reports indicated that North Korea expected to increase its steel production by 3 to 3.5 times in 1961 over 1956 levels; increase pig iron production by 2.8 times; increase coal production by 1.6 times; and increase chemical fertilizer output to 400,000 tons.

Mining.—Most of the major mineral resources of Korea are in the northern area held by the Communists, with important iron ore, copper, lead, zinc, pyrites, coal and magnesite deposits. Mineral production in the Republic of Korea in 1955 included (in metric tons): copper ore, 12,704; tungsten, 3,146; amorphous graphite, 90,018; kaolin, 14,143; fluorspar, 1,081; anthracite coal, 1,308,232; gold, 1.5; silver, 2.5; iron ore, 28,616; manganese, 3,482; talc, 6,201; lead ore, 1,366; electrolytic copper, 327; bismuth, 20,541; monazite, 498; bismuth, 433. (S. Nr.)

Kubitschek, Juscelino (1902—), inaugurated president of Brazil Jan. 31, 1956, was born at Diamantina in the state of Minas Gerais, Braz., on Sept. 12. He graduated with high honours from the medical school of the University of Minas Gerais at Belo Horizonte in 1927, served two years of internship in Paris, Berlin and Vienna, and then returned to Brazil, where he became a successful surgeon. In 1933 Kubitschek was appointed to his first political post, as a government secretary, and the following year was elected to the federal chamber of deputies. In 1940 he took office as mayor of Belo Horizonte, attracting national attention for an extensive city planning project. In 1946 he was returned to the federal chamber of deputies for a four-year term and in 1950 was elected governor of the state of Minas Gerais.

The Brazilian Social Democratic party nominated Kubitschek for the presidency in Feb. 1955, and despite considerable opposition from top army officers he was elected president of Brazil on Oct. 3, and took office on Jan. 31, 1956, for a five-year term. Prior he had flown to Key West, Fla., where he met Pres. Dwight D. Eisenhower on Jan. 5, and then to Europe to enlist financial and technical assistance in the development of Brazil's natural resources. The day after his inauguration Kubitschek announced a new five-year economic plan for Brazil.

Wait: see PERSIAN GULF STATES.

Labour, U.S. Department of: see GOVERNMENT DEPARTMENTS AND BUREAUS, U.S.

Labour: see AGRICULTURE; CHILD LABOUR; EMPLOYMENT; INTERNATIONAL LABOUR ORGANIZATION; LABOUR UNIONS; NATIONAL LABOR RELATIONS BOARD; STRIKES; UNITED STATES; WAGES AND HOURS. See also under various states.

Labour Unions. United States.—Wages kept pace in 1956 with general economic growth in the United States. More than half of the collective bargaining agreements signed during the year called for wage boosts of 10 to 12 cents an hour, and four out of five of the negotiated contracts called for increases of 7 cents or more. Wage increases were generally several cents higher than they had been during the previous year. In addition to the wage increases, most of the contracts provided for improved fringe benefits. The trend toward employer-financed health and welfare benefits continued. The number of paid holidays tended to increase, more than half of the contracts signed in 1956 providing for seven paid holidays more a year.

A significant aspect of the 1956 labour agreements was the trend toward lengthening the duration of contracts to two, three or even five years. These contracts normally called for automatic annual wage boosts during the life of the agreement as well as "escalator" clauses to provide wage adjustments proportionate to increases in cost of living.

A rise in the number of long-term agreements and increases

Table I.—A.F. of L.-C.I.O. and Independent National and International Unions With Reported U.S. Membership in Excess of 100,000

Union	Membership	Union	Membership
Total	16,824,000	Oil, chemical and atomic.	173,000
American Federation of Labor-Congress of Industrial Organizations	15,233,000	Packhouse	120,000
Allied industrial	120,000	Painters	214,000
Automobile	1,169,000	Plumbing	224,000
Bakery	154,000	Post office clerks	102,000
Boilermakers	140,000	Printing pressmen	100,000
Building services	202,000	Pulp and paper	120,000
Bricklayers	143,000	Railway carmen	152,000
Carpenters	764,000	Railway and steamship clerks	272,000
Clothing, men's	370,000	Retail and wholesale (former C.I.O.)	126,000
Communication	297,000	Retail clerks (former A.F. of L.)	262,000
Electrical (former A.F. of L.)	606,000	Rubber	165,000
Electrical (former C.I.O.)	335,000	State, county and municipal	115,000
Engineers, operating	190,000	Steelworkers	1,119,000
Garment, ladies'	426,000	Street, electric railway	178,000
Had carriers	424,000	Teamsters	1,208,000
Hotel	401,000	Textile (former C.I.O.)	276,000
Iron	133,000	Other (100 unions)	2,766,000
Letter carriers	103,000	Unaffiliated unions	1,591,000
Machinists	808,000	Mine, coal	400,000
Maintenance of way	193,000	Railroad trainmen	182,000
Meat	326,000	Telephone union alliance	110,000
Musicians	237,000	Other (54 unions)	899,000

Source: "Directory of National and International Labor Unions in the United States," U.S. Department of Labor, Bureau of Labor Statistics Bulletin No. 1185 (Washington, D.C., 1955).

in the consumer price index during the summer months revived interest in automatic pay raises to keep pace with increased living costs. The steel, electrical machinery and aluminum workers were the largest groups to be covered under the so-called "escalator" clause. The general practice in these contracts was to provide for adjustments in wage rates proportionate to fluctuations in cost of living, but wages could not drop below the level agreed upon when the contract was signed.

The supplementary unemployment compensation provisions which were adopted in the automobile industry in 1955 became effective during 1956, when a sufficient number of states allowed the payment of supplementary benefits in addition to the payments made by state unemployment insurance. Supplementary unemployment compensation was extended to the steel, aluminum, rubber and glass industries in 1956.

There was little change in total union membership during 1956, but some significant developments took place within the trade union movement. One major independent union, the Brotherhood of Locomotive Enginemen and Firemen, with a membership of 96,000 railroad workers, joined the A.F. of L.-C.I.O. Large defections in membership occurred in the United Electrical Workers, the largest of the unions which were expelled from the C.I.O. in 1949 because of Communist domination. Eighteen thousand members of the union in the New York metropolitan area left the United Electrical Workers and joined the International Electrical union, an affiliate of the A.F. of L.-C.I.O., and another 10,000 members in upstate New York deserted the United Electrical Workers in favour of the Machinists. Attempts by the International Longshoremen's association, previously expelled from the A.F. of L. because of alleged racketeer domination, to join the A.F. of L.-C.I.O. were rejected.

About half of the former A.F. of L. and C.I.O. state organizations had merged in the first year since the union of the A.F. of L. and C.I.O. on Dec. 4, 1955.

A major development within the A.F. of L.-C.I.O. was the formation of the Industrial Union department. Seventy-two unions, whose membership was organized wholly or partially on an industrial basis, joined together to form this department with a membership of about 7,000,000 persons. The function of the Industrial Union department was to co-ordinate the bargaining of unions which dealt with the same companies. Therefore, the department was organized along industry groups having common economic and collective bargaining problems.

Two important extensions of federal legislation in the interests of labour became effective in 1956. Unemployment insurance benefits were extended to 1,400,000 new workers under a law



JAMES C. PETRILLO (right), president of the American Federation of Musicians, awaiting his turn to speak as George Meany, president of the A.F. of L.-C.I.O. unions, addressed the platform committee of the Democratic national convention at Chicago in 1956

which brought employers of four or more workers under the unemployment insurance program. Only employers of eight or more employees had previously been covered by federal law, though the majority of states had already passed more liberal coverage provisions of their own. On March 1, 1956, the minimum hourly wage rate under the Fair Labor Standards act was raised from 75 cents to \$1. Out of about 24,000,000 workers covered by the law, about 2,000,000, most of whom were in the south, were directly affected by the increase.

The right of states to pass legislation prohibiting union shops, the so-called right to work laws, remained a central point of contention in a number of states. Louisiana was the first southern

Table II.—U.S. Membership in Trade Unions and Per Cent of Nonagricultural Employment by State, 1953

State	Membership (000s)	% of Non-agricultural employment	State	Membership (000s)	% of Non-agricultural employment
United States . .	16,217.3	32.6	Montana	72.5	47.0
Alabama	168.3	24.9	Nebraska	68.6	19.7
Arizona	55.7	27.7	Nevada	21.8	30.4
Arkansas	67.9	21.5	New Hampshire .	43.1	24.6
California	1,392.5	35.7	New Jersey . . .	645.4	35.2
Colorado	114.2	27.8	New Mexico . . .	25.8	14.2
Connecticut . . .	232.1	26.5	New York	2,051.8	34.4
Delaware	25.8	18.4	North Carolina .	83.8	8.3
District of Columbia .	107.8	21.2	North Dakota . .	17.3	15.6
Florida	135.9	16.2	Ohio	1,162.6	38.0
Georgia	135.8	15.0	Oklahoma	86.7	16.1
Idaho	29.1	21.5	Oregon	201.5	43.1
Illinois	1,358.7	39.7	Pennsylvania . .	1,540.7	39.9
Indiana	569.6	40.0	Rhode Island . .	82.8	27.4
Iowa	159.2	25.0	South Carolina .	49.7	9.3
Kansas	130.8	23.9	South Dakota . .	17.4	14.4
Kentucky	155.1	25.0	Tennessee	187.3	22.6
Louisiana	135.8	19.5	Texas	374.8	16.7
Maine	58.9	21.4	Utah	56.9	26.3
Maryland	203.6	25.2	Vermont	19.6	18.9
Massachusetts . .	546.1	30.1	Virginia	156.1	17.4
Michigan	1,062.0	43.3	Washington . . .	393.6	53.3
Minnesota	327.6	38.1	West Virginia . .	223.9	44.1
Mississippi	50.0	14.7	Wisconsin	418.7	38.3
Missouri	510.5	39.7	Wyoming	24.2	28.6
			Not distributed .	458.5	....

Sources: National Bureau of Economic Research, Inc., 36th Annual Report, pp. 45-46 (New York, May 1956).

state to repeal its right to work law affecting nonagricultural employees. In addition to Louisiana there were 17 other states in the United States which had passed legislation prohibiting union shops.

(S. A. LN.)

Canada.—The outstanding event in the Canadian labour movement in 1956 was the merger convention held at Toronto, Ont., in April, when the Trades and Labour Congress of Canada and the Canadian Congress of Labour joined forces to form the Canadian Labour congress. The membership of the Trades and

Labour congress was estimated at approximately 600,000, and the Canadian Congress of Labour at 400,000.

Nine departments were established by the Canadian Labour Congress convention, dealing with organization, legislation, education, research, international affairs, government employees, provincial federations of labour and labour councils, political education and public relations. The official journal of the new congress was known as *Canadian Labour*.

Before the convention had concluded, an independent group known as the One Big union, with headquarters at Winnipeg, Man., and a membership of approximately 5,000, was accepted as an affiliate of the new congress; and, in July, the General Policy committee of the Brotherhood of Locomotive Firemen and Enginemen authorized an application for affiliation of its Canadian membership of 12,000.

A further step toward labour unity was taken in Sept. 1956 when the Canadian and Catholic Confederation of Labour (membership 100,000) authorized a nine-member committee to continue discussions with Canadian Labour congress representatives, with a view to reaching a basis of affiliation, which would be placed before a special convention in June 1957 for ratification.

In Dec. 1955 the Trades and Labour congress and the Canadian Congress of Labour, as well as the Canadian and Catholic Confederation of Labour and the national legislative committee of the international railway brotherhoods, made representations to the federal government. Considerable unanimity was indicated in the requests for legislative and administrative policies. While employment in Canada continued at a fairly high level, emphasis was laid on the adoption of measures which would lessen the effect of seasonal unemployment. Amendments to the Unemployment Insurance act were requested, particularly the provision of benefits to insured workers who became idle because of illness. All four organizations stressed the desirability of a national health insurance plan and the control of immigration. Other representations dealt with a national labour code, a national minimum wage, equal pay for equal work for men and women, housing, taxation, etc. Strong opposition was expressed to compulsory arbitration, which had been threatened in connection with a nationwide railway strike.

The total membership of labour organizations in Canada as of Jan. 1, 1956, was reported by the federal department of labour to be 1,351,652, or 6½% above the corresponding figure for 1955.

(N. S. D.)

International.—The International Confederation of Free Trade unions reported that on June 1, 1956, it had a membership of 54,000,000 in 114 organizations in 81 countries. The I.C.F.T.U. European Regional organization held its biennial conference in Frankfurt-on-Main, Ger., May 22-24. The conference considered reports on automation, the European common market and Euratom. Resolutions were adopted which stressed the importance of strengthening these European agencies.

A special conference was convened by the European Regional organization of the I.C.F.T.U. in Brussels, Belg., during Aug. 25-27, 1956, to consider the "Revival of the European Idea." The conference adopted a policy statement in favour of a progressive reduction of tariff barriers and the creation of a European common market; it recommended the establishment of a European investment fund to assist the underdeveloped regions in Europe. It was also suggested that closer integration in the field of transport would bring considerable benefits, and the conference proposed the immediate setting up of a European Transport authority. Approval was given to the Euratom proposals, but it was strongly emphasized that the production of atomic energy should be undertaken by public authorities. Finally the conference expressed approval of the recognition, by the conference of ministers of the European Coal and Steel community, of the prin-

iple of levelling up social conditions in Europe and it urged practical measures to bring about a progressive upward adjustment as soon as possible.

Great Britain.—Little change had occurred in total trade union membership during the past few years. During 1955 the affiliated membership of the Trades Union congress rose by 56,783 to 8,263,741. The main increases were recorded by the general unions and unions in the engineering and printing industries.

Since the end of World War II the Trades Union congress had generally adopted a cautious, moderate policy on economic, political and industrial matters. In 1956 the congress did not heed the warnings of the chancellor of the exchequer and it passed resolutions in favour of a militant wages policy and a 40-hr. week.

On the surface the 1956 Trades Union congress was more united than any congress for many years. For the first time since World War II there was no sharp cleavage between the left and right wings of the trade union movement on either domestic or foreign policy issues, but the sharp differences of opinion that separated the Communists and their sympathizers from the rest could not be hidden. The unity that prevailed was purely tactical and was likely to be temporary.

Another important feature of the congress was the markedly political tone of the debates. The government was assailed far more vigorously than the employers, and there were many references to the desirability of securing the return of a Labour government at the earliest opportunity. It was, however, doubted whether the unions would be prepared to accept the implications of the planned economy for which they called, if a Labour government were returned at the next election.

(See also EMPLOYMENT; NATIONAL LABOR RELATIONS BOARD; STRIKES; WAGES AND HOURS.) (B. C. R.)

ENCYCLOPEDIA BRITANNICA FILMS.—*Working Together* (1952).

Labrador: see NEWFOUNDLAND AND LABRADOR.

Labuan: see BRITISH BORNEO.

Lacrosse. The University of Maryland, College Park, swept through its second consecutive campaign unbeaten and tied to retain the Wingate cup, symbol of national intercollegiate supremacy in the sport. When the Terrapins routed Johns Hopkins, 13-6, at Baltimore, Md., on May 19, 1956, they won their all-winning streak through 23 games to again clinch laurels in the Cy Miller division of the United States Intercollegiate Lacrosse association and carry off national honours at the same time. Rensselaer Polytechnic institute, Troy, N.Y., was runner-up in the point standing for competition against other squads of the Cy Miller division. The University of Baltimore tied the Laurie Cox group with 35 points while Colgate university, Hamilton, N.Y., captured the championship trophy in the Roy Taylor division with 28 points. Oberlin college of Gambier, O., carried off the McCormick trophy, symbol of Midwest league laurels.

Maryland's star attack man, Charles Wicker, along with teammates James Kappler, goalie, John Simmons, defense, and James Keating, midfield, gained places on the official first team chosen by the U.S.I.L.A. Rounding out the first ten were John Pendergast, Yale, and Peter Wagner, Rensselaer Polytechnic institute, defense; Robert Kelley, Rutgers, and Arlyn Marshall, Johns Hopkins, midfield; and Stuart Lindsay, Syracuse, and John Howland, Washington college, attack.

In the annual battle between the north and south all-stars, played at Geneva, N.Y., on June 9, the south triumphed by 20-

Yale, with five victories and no defeats, won the champion-

ship in the first official season of the Ivy league. Following the Elis in the final standing were Dartmouth (3-2), Princeton (3-2), Cornell (2-3), Harvard (2-3) and Pennsylvania (0-5).

The Washington and Lee university squad of Lexington, Va., made a 26-day exhibition tour of England and compiled the brilliant record of eight victories in nine contests. A high point of the Americans' trip was a triumph over a combined Oxford-Cambridge team. The Generals' only setback was to an All-England team, by 5-4.

Women's lacrosse continued to gain in interest among college and preparatory schools during the year. The United States Women's Lacrosse association season was climaxed by the group's annual tournament at Waltham, Mass., late in May.

(T. V. H.)

Lamb: see MEAT.

Laos. A landlocked kingdom, a member of the French union, situated in the Indochinese peninsula, Laos is bounded north by China, northeast by the Democratic Republic of Vietnam, east by the National Republic of Vietnam and south by Cambodia. Area: 91,506 sq.mi. Pop. (1955 est.) 1,425,000. The Laotians are Thais and speak a Thai dialect. Religion: Buddhist. Chief towns (pop., 1953 est.): Luang-Prabang (royal capital) 15,000; Vientiane (administrative capital) 20,000. Ruler, King Sisavang Vong; premier in 1956, Prince Suvanna Phuma.

History.—In the elections to the French national assembly held on Jan. 7, 1956, the Progressive party secured 21 seats, Independents (supporters of the government) 8 and other parties 10. In spite of the instructions issued by the Communist-controlled Pathet Lao, 80% of the electorate went to the polls. After a long parliamentary crisis, Prince Suvanna Phuma was able to form a government. Laotian representation in the assembly of the French union was increased from three to five delegates, but the prime minister nevertheless expressed a wish to see modifications in the constitution of the union. On coming to power, the Progressives changed their name to Nationalists.

On Aug. 6 the government reached an agreement with Prince Suphanu Vong, the leader of the rebel Pathet Lao movement: hostilities were to cease; the two dissident provinces of Sam Neua and Phong Saly and the armed forces of Pathet Lao were to acknowledge the royal authority; mixed commissions were to settle the details of unification; further elections were to be held to increase the number of deputies; and a united government was to be formed.

(HU. DE.)

Education.—Schools (1954): primary 677, pupils 35,042 (excluding 100 primary schools closed in areas affected by war); secondary (including 1 teachers' training) 7, pupils 1,126.

Finance.—Monetary unit: 1 kip=10 metropolitan French francs. U.S. \$1=350 metropolitan francs.

Lard: see VEGETABLE OILS AND ANIMAL FATS.

Latin America: see ARGENTINA; BOLIVIA; BRAZIL; BRITISH GUIANA; BRITISH HONDURAS; CHILE; COLOMBIA; COSTA RICA; ECUADOR; FRENCH UNION; GUATEMALA; HONDURAS; MEXICO; NICARAGUA; PANAMÁ; PARAGUAY; PERU; SALVADOR, EL; SURINAM; URUGUAY; VENEZUELA.

Literary Events.—A more revealing demonstration of the vitality of Latin-American letters than the prizes, celebrations and commemorations of 1956 was the increasing number of translations of this corpus of literature into other languages. Such a novel as *Los pasos perdidos* of the Cuban Alejo Carpentier provided stimulating reading for the vast English- and French-speaking public, being read by the latter group as the prize-winning *Partage des eaux*. Thanks to an agreement between UNESCO (the United Nations Educational, Scientific and

Cultural organization) and the Organization of American States, a series of French translations of Latin-American literary works was begun. Additional authors translated during the year in Paris, Fr., were Picón Salas, Rafael Pineda, Domingo F. Sarmiento, Luiz Machado de Arnao and Roberto Ganzo of Caracas, whose complete works were put into French. Italians were given opportunity to read *Il figlio del ladro* (Manuel Rojas) and *Tutto il verde perirà* (Eduardo Mallea), among other translations. An anthology of Latin-American poets appeared in Munich, Ger., under the title of *Schwann im Schatten*.

New literary journals which appeared were *Estaciones*, *Revista literaria* (Mexico), *Ficción* (Buenos Aires), *La Revista Dominicana de Cultura*, and *Cordillera*, announced as a project sponsored by the Bolivian government. In Seville, Sp., the *Anuario de Estudios Americanos* devoted much space to a new section, *Historiografía y Bibliografía Americanista*. The coveted Emecé prize for the novel, awarded in Argentina, went to Federico J. Peltzer for his *Tierra de nadie*, the tragedy of a young lover's guilt and suicide. The corresponding Zig-Zag prize of Chile was awarded to the novelist and story writer Luis Merino Reyes for his novel in manuscript *Regazo amargo*. Brazil's Carmen Dolores Barbosa prize and the Monteiro Lobato award were granted respectively to Origenes Lessa for his novel *Rua do sol* and to Osman Lins for his tales collected under the title of *Os gestos*. Venezuela's highest literary award went to Miguel Otero Silva for his *Casas muertas*, and to the essayist Augusto Mijares for his *La luz y el espejo*.

Poetry.—Mexico's Fondo de Cultura Economica published several important collections of verse, including Alí Chumicero's elegiac and amatory *Palabras en reposo*, Carlos Pellicer's *Práctica de vuelo*, and Octavio Paz's *El arco y la lira*. Brazil produced the complete works of Carlos Drummond de Andrade in a volume of 600 pages entitled *Fazendeiro do ar e poesia até agora*. Lêdo Ivo maintained his position as one of Brazil's important poets with *Um Brasileiro em Paris*, demonstrating again his technical prowess and his gift for selecting poetic themes. A notable member of the so-called Generation of 1945, João Cabral de Melo Neto, made clear once more in his *Duas Aguas* that poetry cast in prosaic form can be highly lyrical. The Venezuelan César Lizardo's *Eternidad del júbilo* (Caracas) is informed with his humanistic credo: "I place over Poetry and Beauty my faith in Man, my unshakable passion for friendship even over Justice." Sensitive impressions and Lorquian metaphor abound in the Peruvian César Miró's *Alto sueño*. The Chilean-American Arturo Torres-Rioseco again showed his diversified talents by publishing in Mexico his *Cautiverio*, a collection of poems from 1940 to 1955; the collection carries a prologue by Gabriela Mistral.

Prose.—Although some critics see the Latin-American novel as evolving from a realistic chronicling of regionalism, emphasizing *costumbrismo* and *indigenismo* toward a more artistic analysis of a broader world, the wealth of national *milieus* was once again exploited to good advantage by the novelists. Such a regionalist novel was *Chão bruto* of the Brazilian Hernani Donato, which treats of plantation life with realism and even sociological polemic. Another such novel was *Casas muertas*, by the Venezuelan Miguel Otero Silva, published in Buenos Aires, Arg.; this story deals with the plain-city of Ortiz, gradually becoming a ghost town as its plague-ridden inhabitants flee it for a safer life elsewhere. *Açoite*, a novel by Armindo Pereira, takes place in the northeast of Brazil and exploits the theme of the famous "Essa Negra Fulô" of Jorge de Lima's poem; the beautiful and pure mulatto daughter of a plantation owner and a slave girl is persecuted unto death in a tragic atmosphere of jealousy and hatred.

Several of the better novels abandon the richness of regionalism to emphasize psychological problems in the absolute. Enrique Lafourcade's *Pena de morte* deals with a disturbed per-

sonality, a painter who has abandoned his art in the quest for an absorbing and perfect love; happiness is denied him by the very unattainability of his standards and his desires, and he proves the familiar theory that man creates his own hell. *Chão de espinhos*, by the Brazilian Ondina Ferreira, treats of the insoluble problem of a woman unable to obtain a divorce and who traverses a "field of thorns" by entering into a forbidden love. Psychological and emotional problems are incessant in José de Barros Pinto's *Jangada*, which brings two former lovers back together into a lifeboat when their ship has been torpedoed off the coast of Brazil. This unusual treatment of a novel theme won this new author fame and a literary prize. The Fondo de Cultura Económica brought out an unpublished novel of Mariano Azuela; *Esa sangre* treats of the tragedy of a man who is unable to reclaim the position and fortune he held before the agrarian revolution. Second prize of Emecé's competition for novelists went to Eliseo Montaine's *El viaje*, a study of evolving emotions and fortunes of a group of travellers thrown together in a coach travelling toward Tandil, Arg. V. Botella Pastor set his psychological novel *Por qué callaron las campanas* in the turmoil of the Spanish civil war, although there is no connection between this story of a triangle and Ernest Hemingway's novel of kindred title. Last but by far from least was Silvina Bullrich's *Teléfono ocupado*, the vivid portrayal of the intimate character of a woman in Buenos Aires through the medium of the telephone, an unusual device of composition which succeeds in maintaining suspense until the end.

In Mexico Julio Jiménez Rueda edited for university students a collection of short stories and prose of José María Roa Barcena, a neglected *cuentero* of the 19th century. The Brazilian diplomat João Guimarães, whose *Sagarana* met with success a decade earlier, published the tales *Corpo de baile*, again recording the dramas, superstitions, joys and passions of the cowboys of his native Minas Gerais. The well-known Brazilian journalist and essayist, Rubem Braga, published a collection of mood-pieces *A Barboleta amarela* ("The Yellow Butterfly"). One final collection of stories worthy of note was the *Historias de Tata Mundo* of the Costa Rican Fabián Dobles.

Anthologies, Literary History.—An important vehicle for the diffusion of Latin-American letters was the *Anthologie de la poésie Ibéro-américaine*, issued in Paris under the editorship of Federico de Onís. The year marked the publication of volume ii of Alfonso Reyes's complete works, constituting three pieces composed by the gray eminence of Mexico in Spain between 1914 and 1924. Also from Mexico came a two-volume anthology of *Poesía gauchesca*, compiled and edited by Argentinians Jorge Luis Borges and Adolfo Bioy Casares. In Havana appeared the *Obra poética* of Emilio Ballagas, arranged by the poet's friends and including verses written from 1925 to the year of his death (1954).

The year was rich in literary scholarship, history and criticism. At least three histories of Chilean literature became available. Raúl Silva Castro's *Panorama de la literatura chilena* (Mexico City) is a scrupulous chronological register of Chilean novelists from José Victorino Lastarria down to the present. From the same city came Arturo Torres-Rioseco's *Breve historia de la literatura chilena*, which justifies the author's claim of objectivity and completeness. These volumes followed in the wake of Montes and Orlandi's *Historia de la literatura chilena*, criticized as being insufficiently complete. From La Paz came the six *Estudios de literatura boliviana* by Gabriel René Moreno. Pinto de Carmo's study of new directions in Brazilian letters was translated and published by the American House of Montevideo. Luis Leal's *Breve historia del cuento mexicano* was hailed as a model of thoroughness and scholarship; its ten chapters trace the genre's evolution from the pre-Hispanic tale to the expres-

nistic pieces of recent date. A companion publication was large Adalberto Vázquez's brief *Perfil y Esencia de la poesía mexicana*. Important as the first broad study of the essay genre is Robert Mead's *Breve historia del ensayo hispanoamericano*. Studies on individual authors varied from familiar to unfamiliar figures. Nobel prize winner Gabriela Mistral was the object of a study probing the motifs of her lyrics, published in Munich by Hans Rheinfelder. Alfredo Cardona Pená's collection *Pablo Neruda y otros ensayos* consists of appreciations of eight contemporary poets, including four Spanish exiles: Guila, Garfias, Moreno Villa and León Felipe. The stature of Bra's Machado de Assis continued to grow. Not only did the National Ministry of Education sponsor a complete bibliography of his works edited by Galante de Sousa, but a new study on him was published by R. Magalhães Junior and a fifth edition appeared of the basic *Machado de Assis* by Lúcia Miguel Pereira. In Mexico Manuel Pedro González published a long essay viewing José María Heredia as the "primogénito del romanticismo hispano." Jorge Luis Borges devoted a volume to Leopoldo Lugones, describing this Cordoban writer as "a man who unconsciously denied himself all passion and laboriously erected lofty and illustrious verbal edifices until coldness and loneliness overtook him." Another serious study of *Lugones Escritor* was published in Buenos Aires by Juan Carlos Ghiano. From Caracas came a keen and lively biography of Pedro Maria Morantes (Pio) by José Carrillo Moreno, including an *ineditum* of that writer, *El Capitán Tricófero*.

(O. Br.; R. J. Cs.)

Latter Day Saints: see MORMONS.

Latvia. A Soviet Socialist republic, Latvia is bounded north by Estonia, east by the Russian S.F.S.R., southeast by Byelorussia, south by Lithuania and west by the Baltic sea. Area: 24,600 sq.mi. Pop.: (1935 census) 1,950,502; (1956 est.) 2,000,000. Nationalities (1935): Latvian 75.5%; Russian 15.6%; Jewish 4.8%; German 3.2%; Polish 2.5%. Religions (1935): Lutheran 56.1%; Roman Catholic 24.5%; Greek Orthodox 8.9%; Old Believers (Russians) 5.5%; Jewish 4.8%. Chief towns (pop., 1935 census; 1956 est. in parentheses): Riga (pp.) 385,100 (565,000); Liepaja 57,100 (80,000); Daugavpils 2200 (55,000). First secretary of the Latvian Communist party in 1956, Janis Kalnberzins; chairman of the presidium of the Supreme Soviet, Karlis Ozolins; chairman of the council of ministers, Vilis Lacis.

History.—The 14th congress of the Latvian Communist party was held in Riga from Jan. 17 to 19, 1956. Kalnberzins was re-elected first secretary; a Russian, Filip Ivanovich Kashnikov, became second secretary. Colonel-General Aleksandr Gorbatov, commander in chief of the Baltic military district, was also elected a member of the new Politburo.

Under the five-year plan 1951–55, 73 new industrial enterprises had been established in Latvia. The 1956–60 plan provided, among others, for the building of a new hydroelectric power station at Plavinas, on the Daugava river.

On Aug. 3–7, a squadron of the Swedish navy paid a visit to Riga. Officers, ratings and journalists making the visit had ample opportunity to observe life in Riga, now, with suburbs, a city of about 800,000 inhabitants with a Russian majority. Living conditions were bad and the average monthly wage of an industrial worker was 800 roubles, barely the price of a suit. A fairly large number of deportees had returned lately, but nearly all were broken in health.

(See also ESTONIA; LITHUANIA.)

(K. SM.)

Education.—Schools (1939; 1950 in parentheses): primary 1,895 (1,700), pupils 229,825 (232,000); secondary 114 (96), pupils 25,225 (20,000). In 1953 Latvia had 10 institutions of higher education with a total of 15,000 students.

Finance.—Budget: (1955 est.) balanced at 1,656,421,000 roubles; (1956) balanced at 1,881,212,000 roubles.

Agriculture.—Main crops (metric tons, 1937–39 average): rye 409,700; wheat 186,900; barley 215,900; oats 433,800; potatoes 1,729,700; flax 22,300. Livestock (1938): cattle 1,224,400; pigs 813,500; sheep 1,360,500; horses 414,000; poultry 5,140,900.

Law. Since 1954 when the school segregation cases were decided, the United States supreme court has found itself the centre of controversy over the extent of its powers. During the election year 1956, many citizens who normally paid scant attention to the activities of the court were mindfully and watchfully following its work. In this climate, decisions of minor legal points that would ordinarily pass without special notice were suddenly seen by some to possess deep and enduring significance.

While the people argued and squabbled about the court, the court itself went about its business and in the process handed down some important decisions. The purpose of this article is to review the important legal developments of general interest enunciated by the supreme court in 1956. (For names of the justices, see the article SUPREME COURT OF THE UNITED STATES.)

Aliens.—The United States supreme court again demonstrated its solicitude for the rights of citizens in denaturalization proceedings in the cases of *United States v. Minker*, 350 U.S. 179, and *United States v. Zucca*, 351 U.S. 91.

The Minker case dealt with the power of an immigration officer to subpoena a naturalized citizen in an investigation aimed at determining whether or not denaturalization proceedings should be instituted against that citizen. Section 235 (a) of the Naturalization act of 1952 grants power to immigration officers to "require by subpoena the attendance and testimony of witnesses." Minker, the subject of the immigration investigation, refused to respond to a subpoena, and the government contended that his refusal was unlawful in that he was a "witness" within the meaning of the statute because he could give testimony at the hearing. The court rejected this contention and ruled that the immigration department had no authority to subpoena a putative defendant who was, himself, the subject of the investigation.

United States v. Zucca involved a denaturalization proceeding brought because Zucca allegedly had concealed his membership in the Communist party and had wilfully misrepresented his intentions and beliefs at the time he was naturalized. The denaturalization complaint was verified by the assistant United States attorney, but no affidavit showing good cause was submitted. Section 340 (a) of the Immigration and Nationality act of 1952 makes the filing of an "affidavit showing good cause" a prerequisite to maintenance of denaturalization suits. The court held that this requirement is a statutory safeguard which "must not be lightly regarded," and it ordered the complaint dismissed. A strong dissenting opinion by three judges criticized the majority position for placing an extreme burden on the government and for promulgating a rule tending to submerge the denaturalization procedure in a "morass of unintended procedural difficulties."

The thrust toward extreme protection of defendants in denaturalization proceedings, however, was checked in *Jay v. Boyd*, 351 U.S. 345. In this case an alien had been ordered to be deported because he had been a member of the Communist party. Section 244 (a) of the Immigration and Nationality act of 1952 provides for discretionary suspension of deportation. Although the deportable alien met the prerequisites to the relief outlined in section 244 (a) of the act, his application was denied on the basis of confidential information never disclosed to him. The court held that there was nothing in the statute or the federal constitution which required a hearing "with all the evidence spread upon an open record" to determine how discretion should



POLISH YOUTHS CLOSELY GUARDED in the defendant's box at the opening of the trial following the riots in Poznan, Pol., in 1956

be exercised with respect to suspension of deportation, because the grant of the suspension is a matter of grace only. Four justices dissented on the ground that the statute required a "hearing" and that any hearing under U.S. law means a full and open disclosure of all the information considered.

Business Regulation.—In an important commercial case, *United States v. McKesson and Robbins*, 351 U.S. 305, the court again showed its animosity toward what it considers price fixing. Price fixing is contrary to the policy of competition under the Sherman act. But the Miller-Tydings act exempts fair trade retail price maintenance contracts from the prohibitions of the Sherman act if such contracts are authorized by state law and if the commodity affected is in free and open competition with commodities of the same general class produced or distributed by others. Thus, while the owner of trade-marked products can sometimes establish "vertical" minimum resale prices binding on those who distribute these products, it is illegal for them to make "horizontal" price-fixing agreements with other producers or distributors who are direct competitors at the same functional level. McKesson and Robbins, the largest drug wholesaler in the United States and also a large manufacturer of drug products, distributes its own brand products directly to retailers through its own wholesale divisions, and also through independent wholesalers. It entered into fair trade agreements with these independent wholesalers respecting its own brand products. The court held that these fair trade agreements violated the Sherman act because they were made with independent wholesalers with whom McKesson and Robbins competed at the same functional level. McKesson and Robbins argued to no avail that the Sherman act, as amended by the Miller-Tydings act, only prohibits price-fixing contracts between two competing independent wholesalers regarding brand products produced by neither of them. A dissent by three judges made it clear that they regarded the majority opinion to be predicated on "lack of sympathy" with the Miller-Tydings act.

Civil Rights.—The question of bringing white and Negro students together in public schools occupied the attention of the court in two cases. Both decisions were consistent with the strong integration position which the court had assumed. In *Florida ex*

rel. Hawkins v. Board of Control, 350 U.S. 413, an action was brought to compel a state university to admit to graduate professional school an applicant who had been refused admission solely because he was a Negro. The state university took the position that the matter should be governed by the broad ruling of *Brown v. Board of Education* which, while holding segregation unconstitutional, gave the school boards time to work out solutions to the problem. The supreme court held that the admission of a Negro applicant to professional school could not be delayed by considerations applicable to desegregation of public elementary and secondary schools. The university was ordered to apply to applicant the same admission standards applicable to other candidates.

In *Lucy v. Adams*, 350 U.S. 1, the court refused to suspend an injunction in which the dean of the University of Alabama had been enjoined from denying admission to persons "solely on account of their race and color." Undaunted, the university continued its long fight to keep Miss Lucy from matriculating. She finally appeared to succeed by indefinitely expelling her for disciplinary reasons. The supreme court was not called on to review the propriety or legality of the expulsion.

Three other important civil rights cases involved the right of employers, governmental and private, to discharge employees because of subversive activities. In these cases the court seemed to adopt the position that employers have broad powers to select and discharge their employees so long as they exercise these powers fairly and consistently with due process of law. In *Slowchower v. Board of Higher Education of the City of New York*, 350 U.S. 551, the court held unconstitutional, as a denial of due process, a clause in the charter of the city of New York which requires the discharge of any employee who pleads the protection of the privilege against self-incrimination to avoid answering a question about his official conduct. Slowchower, a professor at municipally supported Brooklyn college, had refused to testify before a senate subcommittee about his alleged membership in the Communist party. Because of this he was summarily dismissed. The court said, "It is one thing for the city authorities themselves to inquire into Slowchower's fitness, but quite another for his discharge to be based entirely on events occurring before a federal committee whose inquiry was announced as not directed at the property, affairs, or government of the

city." In any event, the court concluded, the statute under which Slowchower was discharged is unconstitutionally arbitrary: "As interpreted and applied by the state courts, it operates to discharge every city employee who invokes the Fifth Amendment. In practical effect the questions asked are taken as confessed and made the basis of the discharge. No consideration is given to such factors as the subject matter of the questions, remoteness of the period to which they are directed, or justification for exercise of the privilege. It matters not whether the plea resulted from mistake, inadvertence or legal advice conscientiously given, whether wisely or unwisely. The heavy hand of the statute falls alike on all who exercise their constitutional privilege, the full enjoyment of which every person is entitled to receive. Such action falls squarely within the prohibition of [the due process clause of the fourteenth amendment]."

In *Cole v. Young*, 76 S. Ct. 861, the court held that it was improper to discharge a federal governmental employee for allegedly being friendly with and helpful to known communists, without first establishing that the employee held a position which could adversely affect the national security.

But in *Black v. Cutter Laboratories*, 76 S. Ct. 824, the court upheld a state court decision that Communist party membership constituted "just cause" for discharge of an employee in private industry under a collective bargaining agreement which authorized the employer to discharge employees for just cause only. The court pointed out that the judgment of the lower court rested on adequate state grounds and that no substantial federal question had been presented.

Criminal Law.—For many years the United States supreme court had insisted that the federal constitution was designed to give maximum protection to persons accused of crime. The decisions handed down in 1956 showed no retreat from this position.

Several cases involved questions of the procedural fairness of grand juries. In *Reece v. Georgia*, 350 U.S. 85, the court reversed a conviction based on a Georgia rule of law which provides that when "an accused has been arrested for the commission of a penal offense and is committed to jail, he is apprised of the fact that his case or the charge against him will undergo grand jury investigation, and it is incumbent upon him to raise objections to the competency of the grand jurors before they file an indictment against him." Reece, a semiliterate Negro, was arrested for rape and he was indicted by a grand jury from which Negroes allegedly had been systematically excluded. One day after the indictment, counsel was provided for Reece for the first time. Counsel objected to the make-up of the grand jury, but the state court refused the objection because it had not been made prior to the indictment. Subsequently, Reece was convicted. In reversing the conviction, the supreme court held that "it is utterly unrealistic to say that he had such opportunity to make timely objection to the composition of the grand jury) when counsel was not provided for him until the day after he was indicted."

But the case of *Michael v. Louisiana*, 350 U.S. 91, makes it clear that an accused can waive his rights to challenge the composition of a grand jury. The court simply requires that the defendant have a fair opportunity to enter his objection. In the *Michael* case three defendants, all Negroes, after being convicted of rape, challenged the make-up of the grand juries which indicted them, on the ground that Negroes had been systematically excluded from the panels. None of them made the objection within the three-day limit set by statute. In the case of two of the defendants counsel had been appointed in time to challenge the grand jury but failed to do so. The third defendant fled the state and was absent during the period in which he could have made his objection. On arraignment after

being returned to the state, he was represented by counsel of his own choosing. At arraignment counsel entered a plea of not guilty and made a motion for severance. Not until several days later did he for the first time object to the composition of the grand jury. The court held that all three defendants had waived their right to object to the composition of the grand juries.

Costello v. United States, 350 U.S. 359, involved another attack on the grand jury system. Frank Costello was indicted by a grand jury and subsequently convicted by a federal district court of the crime of income tax evasion. The grand jury was permitted to consider hearsay evidence, and Costello challenged the indictment on this ground. The court held that the indictment was proper. "The Fifth Amendment provides that federal prosecutions for capital or otherwise infamous crimes must be instituted by presentments or indictments of grand juries. But neither the Fifth Amendment nor any other constitutional provision prescribes the kind of evidence upon which grand juries must act."

Ullmann v. United States, 350 U.S. 422, upheld the constitutionality of the federally-enacted Immunity act of 1954 which requires a witness to give testimony that may be incriminatory in exchange for immunity from prosecution. By the terms of the statute, the Immunity act is applicable only to testimony in cases or investigations involving national security, and the request for immunity must originate from a United States attorney and have the approval of the attorney general. A grand jury, investigating espionage and national security in New York city, put certain germane questions to Ullmann. Ullmann invoked the protection of the self-incrimination clause of the fifth amendment. Upon application of the United States attorney, approved by the attorney general, the court directed Ullmann to answer the questions and it guaranteed him immunity from prosecution. Ullmann still refused to answer the questions, and he was convicted of contempt. On appeal Ullmann contended that the federal statute did not give him immunity from a possible prosecution in the state courts and therefore it was unconstitutional. The Supreme Court replied that the statutory language applied "in any court," which included state courts. The court pointed out that congressional power to provide for the national defense enables it to restrict the exercise of state jurisdiction in this area.

Other less dramatic, but equally important, criminal cases involved situations in which the supreme court, following its best traditions, vigorously asserted or implemented the rights of criminal defendants. *Remmer v. United States*, 350 U.S. 377, for example, showed the supreme court "bending over backwards" to see to it that the defendant got a fair trial. The defendant, convicted for income tax evasion, was here awarded a new trial because of the uncertainty of the effect on his case of an alleged attempt made on his behalf to bribe one of the jurors.

Griffin v. Illinois, 351 U.S. 12, involved the rights of indigents accused of crime. After being convicted of armed robbery, the defendants filed a motion in the trial court asking that a certified copy of the entire record, including a transcript of the proceedings, be furnished to them free of charge. They stated that they were "poor people with no means of paying the necessary fees" for the records. Under Illinois law, the defendant is required to furnish much of the lower court record in order to obtain a full direct appellate review and only indigent defendants sentenced to death are provided with free records. The trial court denied the motion. But the supreme court of the United States vacated the judgment and remanded the case. Said the court, "In criminal trials a state can no more discriminate on account of poverty than on account of religion, race, or colour. Plainly the ability to pay costs in advance bears no rational relationship

to a defendant's guilt or innocence and could not be used as an excuse to deprive a defendant of a fair trial."

Domestic Relations.—Ever since the famous decision of *Williams v. North Carolina*, 325 U.S. 226, was handed down in 1945 the supreme court had been plagued by a series of cases involving the effect of the "full faith and credit" clause of the constitution of the United States on divorce decrees granted by a state in which only one of the spouses is domiciled. Another such case, *Armstrong v. Armstrong*, 350 U.S. 568, came before the court in 1956. In this divorce case, Armstrong, a resident of Florida, obtained a divorce there. Mrs. Armstrong had separated from him and established her residence in Ohio. Service on her was constructive only. In handing down its decision, the Florida court observed that Mrs. Armstrong had made no showing of any need on her part for alimony and decreed that no alimony award be made. Subsequently, Mrs. Armstrong brought suit in Ohio for divorce and alimony. The husband asserted that Ohio was required to give faith and credit to the Florida decision. Partially accepting this contention, the Ohio court denied the divorce on the ground that the Florida decree had already dissolved the marriage. But it awarded alimony. The supreme court of the United States held that the Ohio decree of alimony was not violative of the full faith and credit clause because the Florida decree did not purport to adjudicate the absent wife's right to alimony. A concurring opinion by four judges adopted perhaps a more orthodox approach. This opinion took the position that Florida had denied alimony but Ohio was not compelled to give full faith and credit to this judgment because the wife was not personally served in Florida and could not be bound by an *in personam* judgment there.

A change of heart by natural parents after they have permitted their child to be put out for adoption has caused much sorrow and legal trouble, and it has deterred many potential adopters from taking custody of unwanted children. Adopters can take heart from the decision of *Sklaroff v. Skeadas*, 76 S. Ct. 736, handed down in 1956. Three days after the birth of a child, the mother, then unwed and living in Massachusetts, consented to the child's adoption by a couple from Rhode Island. The couple subsequently initiated appropriate adoption proceedings in Rhode Island. In the meantime, the father and mother of the child had married and had the child's name changed on the Massachusetts records from that of the mother to that of the father. The father opposed the adoption proceedings on the ground that he had never consented to adoption. The law of Rhode Island requires the consent of both parents to legal adoption, and the Rhode Island court, accordingly, ordered the child returned to its natural parents. The adopting parents filed an application to the United States supreme court for a stay of the order. They claimed in the application that "a change of custody . . . would run counter to the decencies of civilized conduct, and thereby would be violative of . . . the due process clause of the Fourteenth Amendment." Justice Felix Frankfurter said that this contention was not frivolous, and he ordered that the Rhode Island judgment be stayed pending a further consideration of the matter.

Labour.—Several important labour decisions were handed down in 1956 concerning alleged unfair labour practices, construction of collective bargaining agreements, the conduct of union officials, the right of the states to regulate labour, and the scope of social legislation enacted to further the health and welfare of the workingman.

Three cases involved alleged unfair labour practices. *N.L.R.B. v. The Warren Co.*, 350 U.S. 107, held that an employer must bargain with a union for a reasonable length of time after the National Labor Relations board has certified the union as the exclusive bargaining representative, notwithstanding the em-

ployer's contention that the union had lost its former majority status by reason of a turnover in personnel. Failure to so bargain is an unfair labour practice.

In *N.L.R.B. v. Truitt Manufacturing Co.*, 351 U.S. 149, the court found an employer guilty of an unfair labour practice in that it refused to furnish employees with information regarding its ability to pay increased wages. The union had asked for a wage increase of ten cents an hour. The company replied that it could not afford an increase of more than two and a half cents an hour, but it denied the union's request to look at its books, arguing that the union had no legal right to such information. The company made no effort whatsoever to substantiate its claim. The court held that the company had not bargained in good faith, but it added that no definitive decision was being made as to the right of the union to company records, since each case must turn upon its own particular facts as to whether the obligation to bargain in good faith has been met.

In *N.L.R.B. v. Babcock & Wilcox Co.*, 351 U.S. 105, the issue was whether or not an employer could refuse the use of company-owned parking lots for the distribution of union literature by nonemployee union organizers. The court held that the employer's refusal constituted an unfair labour practice.

One case decided in 1956 pertained to an important judicial construction of a collective bargaining agreement. In *Mastro Plastics Corporation v. N.L.R.B.*, 350 U.S. 270, the court was asked for an answer to this question: Does a no-strike clause in a collective bargaining agreement bar the employees' right to strike against their employers' unfair labour practices? The court answered the question in the negative, thus seriously limiting the efficacy to employers of a clause in the collective bargaining agreement obliging the union "to refrain from engaging in any strike or work stoppage during the term of this agreement."

Two cases decided in 1956 involved the conduct of union officials. In *United States v. Ryan*, 350 U.S. 299, Joseph Ryan, president of the International Longshoremen's association, was found guilty of violating the Labor Management Relations act by accepting \$1,500 from the president of a shipping firm whose employees were members of the association. Section 302 (b) of the act makes it unlawful "for the representative of any employees" to receive money from an employer. Ryan was president of the association and a member of the wage scale committee of the union. But he claimed he was not a "representative" of any employee within the technical meaning of the act. The court rejected his contention, saying that congress intended the word "representative" to include any person authorized by the employees to act for them in dealings with their employers.

In *N.L.R.B. v. Coca-Cola Co.*, 350 U.S. 264, an employer complained that a certain officer of the union authorized to bargain with the employer had not complied with section 9 (h) of the National Labor Relations act which requires each officer of a labour organization to file an affidavit that he is not a member of the Communist party or affiliated with any organization that seeks to overthrow the government by illegal means. The National Labor Relations board rejected the employer's complaint because "the compliance status of a union . . . is a matter for administrative determination and not one to be litigated in complaint." The supreme court reversed this ruling and held that the employer had standing to raise the question of compliance with section 9 (h) of the act.

Two cases decided in 1956 pertained to the right of the states to regulate labour matters. In *Railway Employees' Department v. Hanson*, 351 U.S. 225, the court held that states had the constitutional right to enact "right to work laws" outlawing union shop agreements only where congress had not pre-empted the field. The case arose when nonunion railroad employees succeeded in getting a Nebraska court to enjoin under its right-to-

work law the application of a union shop agreement. The supreme court of the United States reversed the decision because it said the Railroad Labor act of congress pre-empted this field and permitted union shop agreements to stand.

In *U.A.W.-C.I.O. v. Wisconsin Employment Relations Board*, 36 S. Ct. 794, the court re-affirmed the principle set out in *Railroad Employees' Department v. Hanson*, that, as a general rule, the state may not interfere in labour matters pre-empted by congress. But it held that no federal statute takes away from the states the right to prevent mass picketing, violence and overt threats of violence.

(W. D. Hd.)

(See also AGRICULTURE; BANKING; CIVIL RIGHTS; CIVIL SERVICE, U.S.; CONSUMER CREDIT; EDUCATION; INTERNATIONAL LAW; NATIONAL LABOR RELATIONS BOARD; PUBLIC UTILITIES; SELECTIVE SERVICE, U.S.; TAXATION; UNITED STATES.)

United Kingdom Legislation.—The most important piece of legislation passed through the United Kingdom parliament during the year was the Restrictive Trade Practices act. This set up a Restrictive Practices court, the basic qualification for each member being that he should be "a person appearing—to be qualified by reason of his knowledge of or experience in industry, commerce or public affairs" to hold office for such period not less than three years as might be determined at the time of his appointment. Part 1 of the act provided for the registration with the Registrar of Restrictive Trading Agreements of any agreement between two or more persons carrying on business within the United Kingdom in the production or supply of goods, or in the application to goods of any process of manufacture. Section 8 specified a number of exceptions and section 9 provided for registration which would come into force at such date as the board of trade might determine. Section 13 empowered the court to order the rectification of the register by variation or removal of particulars included thereon; and to declare whether or not an agreement was one to which that part of the act applied, while section 20, probably the most controversial of all the clauses, gave the court jurisdiction to declare whether or not any restrictions were contrary to the public interest, such an order having the effect of making such restrictions void. Section 21 specified circumstances in the absence of any of which a restriction should be deemed to be contrary to the public interest. Sections 14–16 provided for the enforcement of the sections relating to registration.

Part 2 of this act prohibited agreements for the collective enforcement of conditions as to resale prices, but enabled a supplier to enforce such conditions against any person not a party to the sale who subsequently acquired the goods sold with notice of the conditions, unless the agreement had been declared contrary to the public interest.

Part 3 amended the Monopolies and Restrictive Practices acts, 1948 and 1952, and in effect limited the functions of the Monopolies commission to fact-finding inquiries.

Other measures worthy of note were the Food and Drugs act, 1955, the principal effect of which was to provide a stricter code relating to catering premises; the Diplomatic Immunities restriction act, 1955, empowering the executive to withdraw diplomatic immunities where they exceeded those accorded to a British envoy or to those connected with him; the Magistrates' Courts (Appeals from Binding Over Orders) act, authorizing such appeals from magistrates' courts; the Hotel Proprietors act; the Small Lotteries and Gaming act, legalizing small lotteries as therein defined for charitable and similar purposes and exempting small gaming parties held to raise money (other than for private gain) from the laws as to gaming and gaming houses.

More important than these were the British Caribbean Federation act, which gave authority for the setting up of such a

federation and of the appropriate political and judicial organs; and the Clean Air act, which prohibited the emission of dark smoke from chimneys (to be modified in its application for a period of seven years). The Copyright bill, which proposed important changes in the law of copyright and had passed through the house of lords, awaited its final stages in the house of commons.

Commonwealth Legislation.—*Pakistan.*—The outstanding measure of the year was the bill to provide Pakistan with a constitution. This declared that Pakistan was to be a democratic state based on the principles of social justice, and formed a federation consisting of the territories included in or which might hereafter accede to Pakistan. It enshrined equality before the law, freedom from arrest, freedom of speech, the right of assembly, the maintenance of freedom to practise and propagate any religion, the prohibition of slavery, and the right to preserve any distinct language, culture or script. It proclaimed the strengthening of the bonds of unity among Moslem countries, and that Moslems were to order their lives according to the Koran and Sunnah, the teaching of the former being compulsory. It contained measures designed to prevent prostitution, gambling and the consumption of alcohol, to protect the legitimate rights and interests of non-Moslem communities, to promote social security and to reduce disparities in earnings.

The main constitutional provisions were that there should be a national assembly, with 150 members each from East and West Pakistan and with five women members from each. The president would appoint the prime minister. The demarcation of powers between federation and province was fixed by a schedule of subjects, containing a federal list, a provincial list and a concurrent list. Where provincial legislation affecting a subject in the concurrent list was repugnant to federal legislation, the latter was to prevail, but residuary power was to rest in the provincial assemblies. There was to be a supreme court having original jurisdiction both in disputes between the federal government and a province and in disputes between provinces. Both Urdu and Bengali were to be the official languages but English could be used for official purposes for 20 years from Constitution day.

Pakistan decided to remain within the commonwealth.

Canada.—The continuance of the Defence Production act for three years from the date when it was due to expire, namely July 21, 1956, evoked an important debate. The opposition criticized this measure and after debate amendments were agreed which placed orders made under this act subject to parliamentary control and fixed a definite date for the expiry of the "powers" sections.

United Kingdom Case Law.—*Criminal Law.*—In view of widespread public concern over the extent of commercial vice in London, there was much interest in the decision of Judge Maude at the Central Criminal court in *R. v. Silver and Others* (1956 1 W.L.R.281). Four men were alleged to have let flats to individual prostitutes, knowing that they were to be used for prostitution, and to have received rents as high as £25 a week on that account, whereas normal rents would be from £3 to £5 a week. Four other men were alleged to have conducted an estate agency, the main business of which was to let flats to individual prostitutes for the purposes of their trade. On this basis they were charged with living wholly or in part on the earnings of prostitution, contrary to the Vagrancy act, 1898. The learned judge, after speaking of such persons in comparison with shopkeepers, who may supply goods to prostitutes, and doctors, who may render their professional services, said that they were all living on their own earnings. He therefore directed the jury to return a verdict of "Not Guilty."

In *R. v. Owen and Seth-Smith* (*The Times*, Oct. 3, 1956) the

court of criminal appeal held that a conspiracy to defraud a government department in western Germany was not an indictable offense in the United Kingdom.

On the other hand, posting a forged letter in the United Kingdom was sufficient to bring the accused within section 6 (2) of the Forgery act, 1913.

Civil Cases.—In *A. V. Pound and Co. Ltd. v. M. W. Hardy and Co. Inc.* (1956 2 W.L.R. 683) which arose out of a contract made in England whereby purchasers agreed to buy a quantity of Portuguese turpentine f.a.s. buyers' ship at Lisbon, Port., the destination being to the sellers' knowledge in eastern Germany, the house of lords held that there was no general rule that where there was a prohibition on export without licence, then, on an f.o.b. or f.a.s. contract the buyer must supply a ship into or alongside which the goods could legally be placed, the importance of this decision to a large extent resting on the distinction drawn between this case and the decision of the court of appeal in *H. O. Brandt & Co. v. H. N. Morris & Co. Ltd.* (1917 2 K.B.784). Another interesting decision in the same broad field was that of Justice Sellers in *Luigi Monta of Genoa v. Czechofracht Co. Ltd.* (1956 3 W.L.R. 480). In this case a Czechoslovakian company chartered an Italian shipowner's steamship to load a cargo at ports in north China and proceed to ports in Europe. The charter party, which was governed by English law, gave the ship liberty to comply with any orders or direction by any government. The vessel was intercepted by Chinese nationalists.

The court held that the foreign office statement that the British government did not recognize the government in Formosa was not conclusive, that the latter government was a government within the meaning of the charter party, and that the shipowning company was accordingly entitled to freight.

Inland Revenue Commissioners v. Hambrook (1956 3 W.L.R. 643) was one of a series of recent cases in which employers brought actions against parties who had inflicted injuries on, and so deprived them of the services of, an employee. In this case the employee was an official in the service of the commissioners of inland revenue, and the court of appeal, affirming the lord chief justice's decision in the court below, held that an employer in such a case only had a right of action where the employee was a domestic servant.

(W. T. WE.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*The Bill of Rights of the United States* (1956); *The Congress* (1954); *The Constitution of the United States* (1956); *The Supreme Court* (1954); *Understanding the Law—Equal Justice for All* (1953).

Lawn Bowling. At Hartford, Conn., Aug. 6-10, 1956, was held the annual national tournament of the American Lawn Bowling association, as well as the annual meeting of the A.L.B.A. council. In the various contests, the winners were as follows:

Rinks (Four-Man Teams).—The Rettie Memorial trophy was won by Robert Dickson (skip), David Ferguson, Robert Barclay and Charles Quinn of Thistle Lawn Bowling club, Hartford. Winners of the Chicago cup were Robert Gray (skip), Gabriel Strathdie, Earle Hutt and Raymond Lees of New Haven (Conn.) Municipal Lawn Bowling club.

The Wisconsin cup went to Frank Murray (skip), George Plestid, William G. (Bill) Hay and Howard J. Swallow, representing combined clubs of California.

Doubles.—The California trophy was awarded to John McArthur and John Milne of Quincy (Mass.) Bowling Green club. The Lakeside trophy was won by Earle Hutt and Raymond Lees of New Haven (Conn.) Municipal Lawn Bowling club. The Western New York trophy was taken by John Forbes and Forbes Duff of Essex County Lawn Bowling club, Bloomfield, N.J.

Singles.—The National Open Singles trophy went to Peter

Campbell of Smithfield Avenue Lawn Bowling club, Pawtucket, R.I. The Metropolitan trophy was won by Bill Hay of Beverly Hills Lawn Bowling club, Beverly Hills, Calif.

The next annual A.L.B.A. tournament and meeting of the National council was to be held at Seattle, Wash., Aug. 28-Sept. 4, 1957.

Following the national tournament of the A.L.B.A., there was also held at Hartford, Aug. 11, 1956, the annual international match between six rinks teams representing the eastern division of the A.L.B.A. and six teams from the Provincial Lawn Bowling association of Toronto, Can. The U.S. players won 150-91.

In Canada, in addition to territorial and sectional tournaments in the various provinces, the principal lawn bowling event was the Lawn Bowling Championships tournament, held at Vancouver, B.C., Aug. 27-29, 1956. Following play-downs in the several provinces, the territorial champions met in a round robin competition. The singles winner was J. A. Linford of Lachine, Que.; doubles, George W. Davis and Walter L. Buchanan (skip), of Burnaby, B.C.; rinks, Sterling Shields (skip), H. C. Robertson, H. Gardler and James A. E. Gallagher of Edmonton, Alta. The 1957 Canadian championships were to be played at Montreal, Que.

A group of 19 lawn bowlers from Great Britain, under sanction of the International Bowling board, visited the United States Aug. 14-Oct. 24, 1956. Stops were made at selected points in the eastern, central, northwest and southwest divisions of the A.L.B.A., where games were played with the host lawn bowlers. A special feature of this visit was the playing of three contests for the Fox International trophy by teams of four rinks of British and four rinks of U.S. bowlers, each in the eastern, central and southwest divisions, the total combined three scores determining the winners. The outcome was plus 97 points net for the U.S. players, who retained the trophy until another such contest would be held at a later date.

(L. PR.)

Lawn Tennis: see TENNIS.

Lead. World smelter production of lead rose in 1955 as revealed in detail in Table I, based on data in reports of the U.S. bureau of mines, which also supplied data for Table II.

United States.—Despite prolonged strikes in July and August the mine output of the domestic industry increased in 1955 over 1954. Although larger in 1955, the mined lead output was well below the 1946-55 average of 372,000 tons. Of the 1955 total

Table I.—World Smelter Production of Lead

	(Thousands of short tons)						
	1949	1950	1951	1952	1953	1954	1955
Argentina . .	19.9	20.9	26.2	21.8	14.3	25.3 [†]	19.5
Australia . .	168.1	179.8	185.6	175.4	193.2	224.5	210.0
Belgium . .	87.4	68.4	80.3	87.6	84.2	79.2	89.0
Canada . .	146.2	170.4	162.7	183.4	166.4	166.4	150.0
France . .	60.0	70.7	54.0	56.8	60.4	67.7	73.0
Germany . .	71.2	86.6	102.3	122.0	143.0	154.5	151.0
Italy . .	29.0	41.3	40.2	37.8	41.9	41.2	46.0
Japan . .	8.5	11.0	11.8	16.7	19.5	28.9	31.0
Mexico . .	233.7	254.4	241.5	261.7	237.0	230.6	224.0
Peru . .	39.7	34.9	48.8	53.6	65.0	63.6	66.0
Spain . .	36.4	44.7	49.3	51.3	56.5	64.6	67.0
U.S.S.R. . .	99 [†]	123 [†]	141.5 [†]	170 [†]	202.9	228.5 [†]	255.0
U.S. . .	475.9	505.0	414.6	472.5	467.7	486.6	479.0
Yugoslavia . .	62.6	63.1	66.2	74.1	78.0	73.6	83.0
Total . .	1,648	1,810	1,780	1,950	2,020	2,150	2,160

Table II.—Data of Lead Industry in the U.S.

	(Thousands of short tons)						
	1949	1950	1951	1952	1953	1954	1955
Mine output . .	409.9	430.8	388.2	390.2	341.9	325.4	333.0
Refinery output . .	477.3	508.3	417.7	472.8	472.1	486.7	483.0
Domestic ores . .	404.4	418.8	342.6	383.4	328.0	322.3	321.0
Foreign ores . .	72.9	89.5	75.1	89.5	139.9	164.4	158.0
Imports . .	400.5	441.8	257.9	628.1	552.3	443.4	462.0
Exports . .	1.0	2.7	1.3	1.8	0.8	0.6	0.0
Secondary . .	412.2	482.3	518.1	471.3	486.7	480.9	502.0
Consumption . .	957.7	1,238.0	1,184.8	1,130.8	1,201.6	1,094.9	1,209.0
Stocks, year-end							
Producers . .	201.5	137.7	82.0	87.8	65.0	78.9	21.0
Consumers . .	97.3	139.9	102.8	122.5	113.8	124.6	117.0

177,409 tons were from 11 western states; 145,640 tons from three west central states—Kansas, Missouri and Oklahoma; and 10,379 tons from six states east of the Mississippi river.

Consumption, which had turned upward in May 1954 for the first time since Oct. 1953, continued at the higher rate through 1955 and 1956.

In the first eight months of 1956 mine output of recoverable lead was 231,415 tons; refinery lead output was 358,202 tons; and shipments were 140,335 tons.

Bolivia.—In Nov. 1955 a third furnace of the privately owned lead smelter at Tupiza was opened. Lead-bearing ores from Sud Chichas province in Potosí department supplied the chief raw material. Mines in the area produce about 2,000 tons of crude ore a month.

Mexico.—Resumption of the lead-silver-zinc mine in Michoacán state resulted in an increased total output of lead in 1956.

(F. E. H.; B. B. M.)

League of Women Voters of the United States: see SOCIETIES AND ASSOCIATIONS, U.S.

Lebanon. This Arab republic is bounded west by the Mediterranean, north and east by Syria and south and southeast by Israel. Area: 4,015 sq.mi. Pop. (1955 est.): 1,425,000 (Lebanese nationals only). Language: Arabic 90%; French, Armenian, Greek, etc., also spoken. Religion: Christian 52.8% (more than half are Maronites, in communion with Rome); Moslem 45.3%. Chief towns (pop., 1953 est.): Beirut (cap.) 600,000; Tripoli 140,000; Zahlé 30,000; Saida 60,000. President of the republic, Camille Shamun. Prime ministers in 1956: Rashid Karamah, Abdullah el-Yafi (March 20–Nov. 16) and, from Nov. 18, Sami es-Solh.

History.—In March 1956 Rashid Karamah resigned as prime minister and a new government was formed by Abdullah el-Yafi, a former prime minister. The new government declared its opposition to regional pacts and to the Johnston (U.S.) plan for utilizing the waters of the Jordan. Its Arab policy was neutral between Syria, Egypt and Iraq.

In the dispute with the Iraq Petroleum company—one of the principal issues facing the country from the previous year—the new government held rigidly to the initial demand put forward by Lebanon, namely that the annual pipeline royalties should be increased to £L. 28,000,000, whereas the company was offering about £L. 6,400,000 to be increased to about £L. 13,000,000 on the construction of a new pipeline to Tripoli. In January negotiations were broken off, and the stalemate continued under el-Yafi's government, which included Saeb Salam, minister of state especially responsible for oil affairs. In June the government passed a law, backdated to 1952, imposing various taxes on foreign companies from which they had previously been exempt, and the company subsequently announced that it would divert its new pipeline from Homs to Banias in Syria, instead of bringing it to Tripoli.

On Nov. 16 el-Yafi resigned and was succeeded on Nov. 18 by Sami es-Solh, who stated that negotiations with the Iraq Petroleum company and the U.S.-owned Trans-Arabian Pipeline (called Tapline) company would be reopened.

In March Lebanon suffered a severe earthquake which destroyed a large number of villages in the southern part of the country. Relief for the refugees and the rebuilding of demolished houses was one of the government's major internal tasks for the remainder of the year.

(E. S. AH.)

Education.—Schools (1954–55): primary 1,775, pupils 155,297; higher primary 264, pupils 21,442; secondary 92, pupils 4,572; vocational 33, pupils 1,396. Institutions of higher education (including 3 universities, 1954–55) 11, students 4,246.

Finance and Banking.—Monetary unit: Lebanese pound, with an official exchange rate of £L. 2.191 and a free rate of £L. 3.23 to the U.S. dollar.

Budget (1954 est.; 1956 est. in parentheses): balanced at £L. 123,400,000 (£L. 151,500,000). Currency circulation (Oct. 1954) £L. 246,000,000 (Oct. 1955) £L. 271,000,000. Deposit money (Oct. 1954) £L. 345,000,000, (Oct. 1955) £L. 442,000,000. Gold and foreign exchange, official: (Feb. 1955) \$77,700,000 U.S., (Feb. 1956) \$85,600,000 U.S.

Foreign Trade.—(1955) Imports £L. 476,800,000; exports £L. 108,000,000. Main sources of imports: Syria 16%; U.K. 15%; other continental E.P.U. (European Payments union countries) 21%; U.S. and Canada 14%; France 10%. Main destinations of exports: Syria 11%; U.S. and Canada 10%; U.K. 5%; France 5%; other continental E.P.U. 11%; Saudi Arabia (1953) 11%; Egypt (1953) 7%. Main exports (1954): citrus fruit, apples and bananas 15.8%; pulses 9.7%; onions 1.3%; textiles (1953) 9%.

Transport and Communications.—Roads (1954) 4,045 km. (of which 510 km. arterial). Motor vehicles in use (Dec. 1955): passenger 22,578, commercial (including buses) 5,272. Railways (1954): Syria-Lebanon routes 774 km., of which 191 km. owned by Lebanese government; passenger-km. (1955) 6,905,000; freight, ton-km. (1955) 43,850,000. Air transport (1954): passenger-km. 52,320,000; cargo, ton-km. 1,744,000. Telephones (Jan. 1955) 33,192. Radio receivers (1954) 52,021.

Agriculture.—Production (metric tons, 1954; 1953 in parentheses): wheat 60,000 (63,000 in 1955); barley 27,000 (26,000); maize 13,000; lentils 2,000 (2,000); olive oil 12,000 (10,000); grapes 70,000 (80,000); figs 20,000 (12,500); bananas (exports) 6,275 (production, 1952) 17,000; oranges, etc., 75,000 (77,000 in 1955); lemons, etc., 40,000 (25,000 in 1955); broad beans 6,000 (7,000); chickpeas 2,000 (1,000 in 1955); dry beans (1952 and 1953) 5,000; apples 30,000 (30,000); onions 28,000 (38,000); raisins (1951) 1,000. Livestock (1954): cattle 25,000; horses (September) 7,000; asses (September) 24,000; goats 500,000; camels (September) 2,000; sheep (Sept. 1955) 60,000.

Industry.—Production (metric tons): iron ore (57% metal content; 1954 est.) 100,000; cotton yarn (1955) 3,800; cement (1955) 453,600; cotton fabrics (1954) 5,220; woollen fabrics (1954) 290,000 m.; rayon fabrics (1954) 2,200,000 m.; electricity (1954) 181,000,000 kw.hr.

ENCYCLOPÆDIA BRITANNICA FILMS.—*The Middle East* (1955).

Leeward Islands. This term includes the British colonies of Antigua, St. Kitts-Nevis-Anguilla, Montserrat and British Virgin Islands, forming the northern part of the Lesser Antilles and (Virgin Islands) the eastern extremity of the Greater Antilles in the Caribbean. The colonies have in common governor and (with the Windwards) supreme court, but separate legislatures. Population, mainly Negro. Lan-

Colony	Area (sq.mi.)	Population (1946 census) (1955 est.)	Capital (pop., 1955 est.)
Antigua	170*	41,757 51,681	St. John's 11,000
St. Kitts-Nevis-Anguilla	152	46,243 54,327	Basseterre 13,500
Montserrat	33	14,333 14,436	Plymouth 2,500
British Virgin Islands	67	6,505 7,760	Road Town 1,100
	422	108,838 128,204	

*Including Barbuda (62 sq.mi.), Redonda (0.5 sq.mi.), dependencies. †Seat of government. ‡Properly St. Christopher. §Including for administrative purposes Sombro, dependency of Virgin Islands.

guage: English. Religion: Christian. Governor in 1956, A. T. Williams; administrators, Lieut. Col. A. Lovelace (Antigua), Lieut. Col. Hon. H. A. C. Howard (St. Kitts), A. F. Dawkins (Montserrat), G. P. Allsebrook (Virgin Islands).

History.—Weather conditions in 1956 were much more favourable to primary production than in 1955. In Antigua sugar output rose to 28,713 tons and in St. Kitts and Nevis to 50,371 tons. In Antigua the sea-island cotton crop amounted to 1,134,277 lb., little less than the record crop of 1955, while cotton production in Nevis increased to 574,624 lb. For technical reasons, no cotton crop was planted in Montserrat for reaping in 1956, in consequence of which production of fruits and vegetables greatly increased. Export of livestock from the Virgin Islands decreased.

There were two constitutional changes of major importance during the year. In January the ministerial system of government was introduced in Antigua and St. Kitts-Nevis-Anguilla, and on June 30 the Leeward Islands colony, a federation established in 1871 and comprising four presidencies, was abolished, the four presidencies becoming colonies. (P. D. Md.)

Education.—(1955) Antigua: primary schools 39, pupils 11,562, teachers 265; secondary 8, pupils 1,661, teachers 72. St. Kitts-Nevis-Anguilla: primary 38, pupils 10,928; secondary 4, pupils 810, teachers 17. Montserrat: primary 13, pupils 3,200, teachers 91; secondary 1, pupils 182, teachers 12. Virgin Islands (1954): primary 12, pupils 1,886; secondary 1, pupils 113. A teachers' training college for women at Antigua and the University College of the West Indies, Jamaica, serve all the Leeward Islands.

Finance and Trade.—Monetary unit: British West Indian dollar; B.W.I. \$1.70 = U.S. \$1.

	Budgets (1955 est.)	
	Revenue	Expenditure
Leeward Islands		
Antigua	£1,116,006	£1,139,000
St. Kitts-Nevis-Anguilla	£961,000	£957,000
Montserrat	£228,000	£213,000
Virgin Islands	£115,000	£113,000

Foreign Trade.—(1955) Imports £3,940,000; exports £2,640,000. Principal exports (1955): sugar, sea-island cotton, molasses, tomatoes, salt, limes, fruits; main destination of exports, U.K. Principal imports: food, drink, tobacco, timber; main source of imports, U.K. and other commonwealth countries.

Legislation: see LAW; TAXATION; UNITED STATES. See also articles on individual nations and U.S. states.

Lemons: see FRUIT.

Leukemia: see BLOOD, DISEASES OF THE.

Liberia. Liberia lies on the southwest coast of Africa and is bounded by Sierra Leone (British) and the French overseas territories of the Ivory Coast and Guinea. Having established itself as a Negro republic in 1847, Liberia is one of the oldest independent countries in Africa. It has an area of approximately 43,000 sq.mi. and a population estimated at about 1,250,000 in 1955. The capital and largest city, Monrovia (population of city and environs estimated at 45,000), has a modern port and an international airport about 50 mi. away.

English is the official language, but most of the tribes continue to speak their own languages and dialects of which there are about 25. The central government, in an effort to implement the administration's unification program, has been pursuing actively a literacy campaign. Although paganism still exists, many of the tribesmen are Christians as a result of the extensive missionary efforts. Islam has been making inroads, particularly in the north.

President in 1956: William Vacanarat Shadrach Tubman.

History.—In Jan. 1956 President Tubman, who won the May 1955 elections by a majority of 99.5% of the vote, was inaugurated for a third term; the elaborate ceremonies lasted a fortnight and 30 nations had delegations in attendance. Although

some individuals expected President Tubman to effect changes in his cabinet, he reappointed the same cabinet which served him during the previous term. President Tubman devoted considerable time and energy during the early part of the year to making visits into the hinterland where he held executive councils to settle tribal differences. He was invited to visit various European capitals, including Rome, The Hague and Bonn.

Indications were that the year 1956 would produce the highest governmental revenues ever; estimates ran between \$18,000,000 and \$20,000,000.

The government continued to push its road construction program, and sizable commitments were made against the \$15,000,000 credit the government obtained in 1955 from the Export-Import Bank of Washington. In addition, the government explored the possibility of improving other forms of communications (radio, telephone, air, etc.) between Liberia and other areas as well as within the country.

Foreign investors continued to show interest in Liberia and several significant concessionaires started or expanded their activities in 1956. Private investment by United States firms remained paramount, but private Swedish and German investments continued to be made.

(A. J. Dr.)

Education.—In 1955 there were 456 schools with (1954) 1,358 teachers and enrolment of 40,353, about 9.5% of the population of school age. The five coastal counties accounted for 72% of the enrolment. There was one university. Illiteracy was estimated at 95%.

Finance.—The monetary unit is the U.S. dollar supplemented by Liberian fractional coins. Actual government expenditure in 1955 was \$15,297,805; revenue (Jan.-Nov.), \$14,354,967. The 1956 budget estimated revenue at \$14,850,000 and expenditure at \$14,858,320. The public debt, external and internal, totalled \$7,860,554 on Nov. 30, 1955. The U.S. department of commerce estimated U.S. direct private investments in 1955 at \$261,000,000, over 75% of which represented investments in oil tankers registered under the Liberian flag.

Trade and Communications.—Exports in 1955 totalled \$42,839,300; imports, \$25,964,900. Leading exports were rubber (79%), iron ore (16%), palm kernels (2%) and diamonds (1%). Leading customers were the U.S. (87%), the Netherlands (5%), western Germany (4%) and the U.K. (2%); leading suppliers, the U.S. (62%), western Germany (11%), the U.K. (11%) and the Netherlands (7%).

There are 39 mi. of private railway and about 720 mi. of roads. On Jan. 1, 1955, there were 1,418 automobiles and 1,349 trucks. Telephones (Jan. 1, 1955) numbered 621, all in Monrovia. According to *Lloyd's Register of Shipping*, 436 vessels (100 tons and over) aggregating 3,996,904 gross tons were registered under the Liberian flag on June 30, 1955. In 1955, 1,067 vessels entered the port of Monrovia.

Production.—Agricultural exports in 1955 included rubber 86,780,800 lb.; palm kernels 21,222,900 lb.; cacao 1,048,500 lb.; coffee 735,500 lb.; piassava 5,749,600 lb. Mineral exports included iron ore 1,716,900 long tons and diamonds 203,500 carats.

(J. W. Mw.)

Libraries. Years of unremitting effort on the part of organized librarians were rewarded on June 19, 1956, when Pres. Dwight D. Eisenhower signed a bill, introduced in congress by Sen. Lister Hill of Alabama, to promote library services in rural areas. As President Eisenhower pointed out in his message accompanying the signed bill, which became the Library Services act, public law 597, the purpose of the law was to "stimulate states and local communities to increase library services available to rural Americans." It authorized the federal government for five years to make an annual appropriation of \$7,500,000 to state library extension agencies in basic and matched grants. Any state library extension agency (including those in Alaska, Puerto Rico, Hawaii and the Virgin Islands) was eligible to receive federal funds provided it had not reduced its current budget and provided it submitted a plan of administration acceptable to the U.S. commissioner of education. The basic allotment for each agency was \$40,000, except for the Virgin Islands where it was \$10,000. The balance of the appropriation would be distributed as matched grants, with the federal government contributing from 33% to 66% of the additional budget, with the federal share determined by the percentage of rural population and per capita income in the states. To qualify for assistance, extension programs had to be undertaken in incorporated or unincorporated places with populations of less than



LIBERIAN CHIEF OF PROTOCOL James Morgan checking a point of etiquette at the 1956 inauguration of Pres. William V. S. Tubman. Fans were distributed to all guests attending the ceremonies held in temperatures of more than 100° F.

9,000. Most of the 26,000,000 persons in the United States who live without library service live in such rural areas.

New Public Library Standards.—The Coordinating Committee on the Revision of Public Library Standards, headed by Lowell Martin, presented its report, *Public Library Service to America*, to the American Library association council. The report was the result of a two-year study financed by the Public Libraries division of the association and the Carnegie corporation and was a complete revision of the *Post-War Standards for Public Libraries* of 1943.

The major portion of the report presented 70 general principles of public library service and 200 implementing objective standards. A supplement analyzed 1956 costs of library service by presenting model budgets for four public libraries ranging in size from a county library serving 50,000 persons to a library serving a metropolitan population of 200,000. Throughout the report there was emphasis on the quality of library service offered and the necessity of combining into larger units of service. The committee, by its variable budgets for libraries of different sizes, suggested that in 1956 the annual per capita costs for adequate library service would range inversely from \$3.41 for the library serving only 50,000 to \$2.60 for the metropolitan library serving 200,000. However, the report extended beyond the study of costs and considered the purposes and function of the public library, the structure of service, materials, personnel, physical facilities and the organization and control of materials.

Council on Library Resources, Inc.—U.S. research libraries received important aid with the establishment of the Council on Library Resources in Sept. 1956. A nonprofit corporation established with a grant of \$5,000,000 from the Ford foundation to cover initial expenses for a period of five years, the purpose of the council was to seek solutions to the problems of research libraries. It aimed to develop the application of scientific techniques and mechanisms to library procedures, to extend inter-library co-operation, to promote developments that would enable academic libraries to serve both undergraduates and research scholars better and to promote liaison with foreign research libraries and collections.

Library Statistics.—Public library circulation in the United States continued to rise. The index of public library circulation compiled by the University of Illinois library school stood at 85 for the early part of 1956 as compared with 98 in the preceding year. Using 1939 as a base, the index had shown a steady rise following a wartime slump in 1945 to 75.

Statistics of the U.S. office of education reported in 1956 for public libraries in 108 cities of more than 100,000 population showed book holdings of 56,916,000 and a total annual circulation of 171,449,000. Total annual library expenditures in the cities was \$82,134,000. The annual per capita expense was \$1.76. The university library with the largest book collection in 1956 was that of Harvard, with more than 6,000,000 items. Harvard also spent most for books and binding, but the University of Illinois had the largest number of acquisitions reported, with 63,294.

Intellectual Freedom.—Columbia Pictures released a film, *Norm Center*, with Bette Davis in the role of a small-town librarian who refused to remove a controversial book from the shelves of the library. The film was made after consultation with officers of the American Library association, and John D. Henderson, chairman of the Intellectual Freedom committee, acted as technical consultant. The reaction of librarians to the film was favourable, and it was a shock to some of them when the Motion Picture Decency put it in a special classification, disapproving on political rather than moral grounds.

The University of Kansas (Lawrence) received the *Letter* literary award at Miami Beach for its exhibition of books from

Plato to Hemingway that had been banned. The purpose of the exhibit was to illustrate the great cultural contribution of some books that had been suppressed by censors.

In July libraries were still having difficulty with the U.S. attorney general's interpretation of the 1938 Foreign Agents Registration act. By this interpretation the post office refused to deliver some things published abroad, such as Russian newspapers and some pacifist books published in Great Britain.

Most pressures were directed against the circulation of books accused of obscenity. Librarians were presumably subject to some of these pressures, but there was no reason to believe that in large and well-supported libraries great freedom of book selection did not exist in 1956. An encouraging trend was the continued increase in full library services offered to Negroes in the south.

Notable Additions to Collections.—Described as the greatest gift of its kind ever made, the J. K. Lilly library, gathered over a period of 30 years, was presented to Indiana university. The collection is strong in books about the discovery and exploration of America, American history, American and English literature, manuscripts of Indiana authors and early science and technology.

The University of California, Berkeley, marked the acquisition of its 2,000,000th volume with a Shakespeare first folio. The University of Illinois acquired the private library of Carl Sandburg. Florida State university acquired the Olin Downes music library of 1,500 books, 1,200 scores and 1,200 long-playing recordings. Columbia university announced notable acquisitions in Chinese and Tibetan literature and the manuscripts of George Santayana. Washington university, St. Louis, Mo., acquired a 35,000-volume patent library gathered by Roy Eliers, a St. Louis patent attorney. The University of Kansas acquired the William Butler Yeats books collected by P. S. O'Hegarty. The University of Rochester added the Thomas E. Dewey papers to its collection.

Library Buildings.—The Denver Public library building, constructed at a cost of \$3,300,000, was opened in 1956. Public libraries throughout the country were constructing both main and branch buildings. The \$2,500,000 Donnell branch of the New York public library was a notable example of the latter.

Among the colleges and universities dedicating new library buildings in 1956 were Western Reserve university, DePauw university and Carleton college. Louisiana State university, Washington university of St. Louis, and City College of New York each secured an appropriation of \$3,500,000 for the construction of new library buildings. Ground was broken on a \$1,650,000 building at Colgate university.

National and State Libraries.—Congress acted to create a national library of medicine, combining in one library system the world-famous Army Medical library and the medical libraries of the navy, air force and public health service. After surveying various locations, congress decided to construct a new library building in Washington, D.C., for the institution.

Appointments.—Some large university libraries acquired new directors during the year. Wayne Yenawine became director of libraries and dean of the library school at Syracuse university. William B. Locke was appointed at Massachusetts Institute of Technology, Arthur Hamlin at the University of Cincinnati, William B. Ready at Marquette university and James V. Jones at St. Louis university. Other university library appointments were Russell S. Dozer at DePauw, Joseph Komidar at Tufts, Wyman Parker at Wesleyan and James Ranz at Wyoming. Important college library headships went to Eileen Thornton at Oberlin, Flora E. Reynolds at Mills college and Donald Thompson at Wabash college.

Louis D. Sass became dean of the library school at Pratt in-

stitute, and Janice Kee was appointed secretary of the Wisconsin Library commission. Important public library directorships went to Morton Coburn at Edmonton, Alta., and to Marjorie Donaldson at Pasadena, Calif. Henry Cummings Campbell, formerly head of the United Nations Educational, Scientific and Cultural organization Clearing House for Libraries, became director of the Toronto Public library.

Grants and Aids.—A Rockefeller foundation grant of \$116,000 provided for the establishment of an American Library association office for overseas development. The Carnegie corporation granted \$50,000 to the Western Reserve university school of librarianship to evaluate the curriculum of library schools. The U.S. Steel corporation granted the Association of College and Research Libraries \$30,000 to strengthen college and university libraries through the improvement of equipment, collections and programs supplementary to teaching. Remington Rand donated \$5,000 to make a small number of grants to four-year nontax-supported liberal arts colleges. The *New York Times* gave \$5,000 for supplying microfilm copies of back files of the *Times* to college libraries.

(See also AMERICAN LIBRARY ASSOCIATION; SOCIETIES AND ASSOCIATIONS, U.S.) (H. W. WR.)

International.—Mechanization and cataloguing, which sprang into prominence in library research in 1955, continued to attract many writers in 1956. Special attention was paid to mechanical methods of storing and sorting recorded knowledge and to mechanical translation. The issue for October of *Library Trends* and that for April of *American Documentation* surveyed recent work in this field.

The organ of the International Federation of Translators, *Babel*, devoted its number for October to machine translation; the Cambridge Language Research group initiated a scientific study of language and the potentialities of translating by machine. Interest centred on dividing the "store" or "memory" of the machine into words of common usage (about 90%) and words peculiar to the intellectual or scientific content of the job in hand (about 10%). A striking example of the use of computers for semantic research was the production by a U.S. computer in 2,000 hours of a 1,000-page concordance to a new edition of the Bible. A service known as DMS (Documentation of Molecular Spectroscopy), established in London and Weinheim, Ger., for an annual subscription of £65, proposed to issue about 2,000 cards a year, four-fifths of them carrying spectral diagrams and one-fifth literature references. The better use of libraries and the improvement of means of communicating information were the subjects of many studies; the Ford foundation established the Council on Library Resources in Washington, D.C.; and *Bibliotekar*, no. 10 (Moscow, 1956), was virtually a special issue on this topic.

The improvement of cataloguing rules also figured largely in 1956. The *UNESCO Bulletin for Libraries* continued its series of articles on the trend of revision in various countries with essays on cataloguing in Spain and France. With the assistance of UNESCO (the United Nations Educational, Scientific and Cultural organization), the International Federation of Library Associations (I.F.L.A.) had already begun a study of the principles for establishing main entries for anonymous works and works of corporate authorship; its report was published in *Libri*, vol. 6, no. 3, pp. 271-298. The *Library Quarterly*, vol. 26, no. 4 (October) contained a number of articles on the revision of cataloguing codes.

UNESCO, at a meeting of experts in Paris, Fr., on Feb. 5-10, examined the Brussels convention of 1886 on the international exchange of publications with a view to drafting a new convention. This meeting was followed on Oct. 1-5 by one in Havana, Cuba, on the international exchange of publications in Latin

America, at which it was proposed to establish a pilot national centre for exchanges, perhaps in Brazil or Chile. The Organization of American States was asked to consider drawing up an inter-American convention on exchanges. The second edition of UNESCO's *Handbook on the International Exchange of Publications* was published in Paris. Among other UNESCO publications were L. Brummel's *Union Catalogues, Their Problems and Organization*, and Frank M. Gardner's *The Delhi Public Library: an Evaluation Report*, scheduled for issue at the end of the year.

In Calcutta the UNESCO Research Centre on the Social Implications of Industrialization in South Asia began work, equipped with library and documentation services. The work of UNESCO in developing bibliography, libraries and documentation during the first ten years of its existence was summarized by Verner W. Clapp in *American Documentation*, vol. 7, no. 2, pp. 127-133 (April), and fully described in the *UNESCO Bulletin for Libraries*, vol. 10, no. 11/12 (December), which was a special anniversary issue.

The I.F.L.A. held its 22nd council meeting at Munich, Ger., on Sept. 2-4. One of the new bodies set up at the Brussels conference in 1955, the International Association of Agricultural Librarians, issued the first number of its *Quarterly Bulletin* in January. The International Federation for Documentation (F.I.D.) council met at Stuttgart, Ger., on Aug. 27-29 under the chairmanship of Alexander King (United Kingdom). Poland was admitted as the 24th national member of F.I.D. A special study was made of the development of new methods and techniques for communicating knowledge, based on King's earlier paper presented to the International Advisory Committee on Bibliography during its meeting at UNESCO house on May 24-26, when a five-year plan of work was drawn up.

The third International Congress on Archives was held in Florence and Siena, It., at the end of September.

Great Britain.—An event of unusual liturgical and typographical importance was the discovery in October of a book published by William Caxton. During the recataloguing of the library of the Collegiate Church of St. Mary, Warwick, there came to light a copy of the *Legenda secundum usum Sarum*, hitherto known only from 29 odd leaves at Cambridge and a few elsewhere. The newly found volume, of 342 leaves, was printed by Maynyal in Paris in 1488 and bore Caxton's device, showing that it must have passed through his Westminster office.



CONVEYOR BELT arching over 14th street, Denver, Colo., as books and documents were transferred from the old library into a new building, across the street, which was opened Oct. 18, 1956

British public library statistics for 1955-56, issued in Nov. 1956, showed that at least 32,000 service points and 183 mobile libraries were in operation, with a total stock of 63,400,000 volumes and a full-time staff of 12,700. Book expenditure was £3,410,000 and the total cost of the service was £13,870,000, or 5s. 5½d. per head of population.

Lending library issues were 398,700,000, or 7.8 per head, an increase of 12,400,000.

Other Countries.—The French Library association celebrated its 50th anniversary on Nov. 20-21. The Direction de la Documentation in Paris announced plans to produce, in collaboration with the Fondation Nationale des Sciences Politiques, an abstracting service on cards covering the political, economic and social sciences. The Direction des Bibliothèques replaced its own *Bulletin d'informations* and the Bibliothèque Nationale's *Bulletin de documentation bibliographique* by a new periodical called *Bulletin des bibliothèques de France*.

The Leipzig edition of the *Börsenblatt für den Deutschen Buchhandel* reported on May 12 that the library of Gotha, containing 600,000 volumes, including productions of Gutenberg's press, first editions of Cicero and Luther and many other rarities, would shortly be returned to Gotha by the Academy of Sciences at Leningrad, where it had been preserved since World War II.

Olomouc University library, Czechoslovakia, came to the fore as a producer of important bibliographies, including a catalogue of the 1,900 incunabula in the library (*Soupis Prvotisku Univerzitní Knihovny v Olomouci*) and a number of scientific and technical indexes. Statistics in *Bibliotekar*, no. 7 (Moscow, 1956), of Yugoslav libraries gave the total holdings of the six national libraries (Belgrade, Zagreb, Ljubljana, Skoplje, Sarajevo and Cetinje) as about 2,000,000 volumes. Complete figures for public and other libraries were not given. The Bulgarian National Library, Sofia, celebrated its centenary. Budapest City library had in preparation a dictionary of library terms in English, French, German, Hungarian, Italian, Rumanian, Russian, Spanish and Swedish.

(F. L. K.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*The Library Story* (1952).

Libya. A federal kingdom in North Africa, Libya is bounded north by the Mediterranean, west by Tunisia and Algeria, south by French West Africa and French Equatorial Africa and east by Egypt and Sudan. Area: 679,358 sq.mi. Pop. (1954 census): 1,091,830; Berbers, with Arab admixture; Italians; small Greek, Maltese and Jewish communities. Language: Arabic. Religion: mainly Moslem. Capitals (pop., 1954): Tripoli 130,538; Benghazi 70,533. King, Idris I; prime minister in 1956, Mustafa Ahmed ben Halim.

History.—The new house of representatives of 55 members, elected on Jan. 7, 1956, was opened by King Idris at a special meeting at Derna. Because of his health, the king was unable to travel the long distance from his Tobruk residence to Tripoli, the government's seat. On March 25 ben Halim reshuffled his cabinet, retaining the portfolio of foreign affairs.

King Idris paid a state visit to Turkey (Aug. 6-11), stayed there ten days in a private capacity and on Aug. 23 arrived on a three-day official visit to Beirut, Lebanon.

On Jan. 6 N. I. Generalov, former Soviet ambassador to Australia, arrived at Tripoli as the first Soviet ambassador to Libya. In March the Libyan government rejected an offer of Soviet credit and arms.

On April 8 it was announced that the United States had offered Libya \$12,000,000 in additional aid, 30,000 tons of wheat as a gift for famine relief, and the equipment for 1,000 men for the expansion of the Libyan army.

On June 18 ben Halim arrived in London for talks. Returning to Tripoli on July 2 he said that the British government had

agreed to create a nucleus of the Libyan air force and navy and provide free arms and equipment for 10,000 troops.

On Aug. 16, in connection with the Suez crisis, antiwestern and pro-Egyptian demonstrations took place in Tripoli, Benghazi and other towns. To disperse mobs the Libyan police had to use tear-gas bombs.

Education.—Schools (1954-55). *Tripolitania*: primary 196, pupils 34,142, teachers 1,172; secondary 4, pupils 1,756, teachers 135; vocational 2, pupils 348, teachers 38; teachers' training colleges 2, students 798, teachers 35. *Cyrenaica*: primary 94, pupils 20,232, teachers 573; secondary 3, pupils 427, teachers 49; vocational 3, pupils 134, teachers 26; teachers' training colleges 2, students 71, teachers 14. *Fezzan*: primary 27, pupils 2,008, teachers 57.

Finance.—Monetary unit: Libyan pound, at par with sterling, divided into 100 piastres. Budget (1953-54 actual; 1955-56 est. in parentheses): revenue £6,191,709 (£9,816,405), expenditure £5,149,291 (£9,816,405). Currency circulation (Jan. 1954) £3,849,000, (March 1955) £4,566,000. Bank deposits (1954 est.) £7,000,000.

Foreign Trade.—(1955) Imports £14,340,000; exports £4,620,000. Chief sources of imports (1954): Italy 32.9%; U.K. 21.9%; Ceylon 6.5%. Chief destinations of exports (1954): U.K. 30.8%; Italy 29.8%; Greece 17.3%. Main imports: foodstuffs, textiles, petroleum products, agricultural machinery, motor vehicles. Main exports: esparto, peanuts, livestock, wool, sponges, tunny.

ENCYCLOPÆDIA BRITANNICA FILMS.—*Mediterranean Africa* (1952).

Liechtenstein. Liechtenstein is an independent principality lying between Switzerland and Austria, united with Switzerland by monetary and customs union. Area: 61 sq.mi. Pop. (1955 census): 14,861. Language: German. Religion: Roman Catholic. Capital: Vaduz, pop. (1955) 3,031. Sovereign prince, Franz Josef II; minister-president (appointed Sept. 3, 1945), Alexander Frick.

History.—The event of the year 1956 was the celebration, on Sept. 8-9, of the 150th anniversary of the country's independence. Frick, the head of the government, and Alois Richter, the president of the *landtag*, made speeches emphasizing the profound attachment of the Liechtenstein people to the idea of independence and sovereignty of their principality.

On June 20 Prince Franz-Josef and his Princess Georgine returned to Vaduz from a month's visit to the United States.

Education.—Schools (1955-56): primary 14, pupils 2,130, teachers 58; secondary 4, pupils 461, teachers 32.

Finance.—Included since Jan. 1924 in the Swiss customs union, Liechtenstein uses Swiss currency. In 1956 the franc was valued at 23.3 cents U.S. Budget (1955 actual; 1956 est. in parentheses): revenue 5,965,442 Fr. (7,736,750 Fr.); expenditure 5,967,250 Fr. (8,100,557 Fr.). Public debt (Dec. 31, 1955): 10,351,111.20 Fr.

Agriculture.—Chief products: grain, potatoes, fruit, wine, vegetables. Livestock (1955): cattle 5,548; sheep 804; horses 295; pigs 3,635; goats 770; chickens 33,002.

Industry.—Cotton weaving and spinning, ceramics, artificial teeth, pottery, hardware, machinery, sausage cases.

Life Insurance: see INSURANCE.

Life Statistics: see BIRTH STATISTICS; CENSUS DATA, U.S.; DEATH STATISTICS; INFANT MORTALITY; SUICIDE STATISTICS.

Limes: see FRUIT.

Linen and Flax. Flax continued in 1956 to represent only about 5% of the world's fibre production, with most of it being produced in the U.S.S.R. and eastern European countries.

The United States, which produces practically no flax of its own for textile purposes and only a limited supply for linseed oil, continued to be the leading consumer of linen products. Irish linen (from Northern Ireland) continued to be the major source of linen imported into the U.S., the total value of Northern Ireland linen exports to the U.S. in 1955 being £6,562,000.

The Belgian linen industry, which in 1955 started an intensive promotional campaign in the United States, ranked second in the U.S. market. Competition was increasing, however, from Italy, France, Peru and especially Japan.

The 22-nation conference held in Geneva, Switz., under the General Agreement on Tariffs and Trade (G.A.T.T.) reduced rates of duty on a variety of linen items imported from any country except those behind the "iron curtain." These reductions,

which ranged in size from 8½% to 76% of the pre-existing duty rates, were scheduled to go into effect in three successive stages, beginning June 30, 1956, June 30, 1957, and June 30, 1958.

The third event of major significance occurred only a few weeks later when on June 25, 1956, Pres. Dwight D. Eisenhower ordered a drastic increase (from 10% to 40% ad valorem) in the tariff on linen towelling imported into the U.S. This was the first time the tariff "escape clause" had been used in a textile case.

Other developments of interest were a continued trend toward bright colours and gay prints and toward further experimentation with blends of linen with other fibres. Potentially most important of all was the announcement by a British company in 1956 of the development of a new process for making linen crease-resistant in a manner which would require a minimum of ironing, after washing.

On the whole, the linen trade for the year 1956 was expected to be slightly better than in 1955. (J. RL.)

Lions Clubs, International Association of: see SOCIETIES AND ASSOCIATIONS, U.S.

Liquors, Alcoholic. The three principal problems which occupied and disturbed the distilled beverage industry in the United States during 1955 did not find an appreciable approach toward solution in 1956.

Sales and distribution of illegal whisky not only continued but actually increased at an accelerated pace. A total of 14,499 illegal stills were seized by authorities in 1956, and it was believed that at least 25,000 illicit stills continued in operation.

The remedy believed to be most effective for this situation, a reduction in the excise tax which had been written into the law enacted April 1955 to be effective in April 1956, was cancelled in congress in the latter month.

The third and perhaps most troublesome problem for the industry was the so-called bonding law, which prescribes that the tax on U.S. whisky reaching the age of 8 years must be paid irrespective of whether or not any of it has been sold. Many smaller distillers who found themselves unable to raise the large sums required for such payments were forced to sell at great losses or go out of business.

By 1956 all but two states, Mississippi and Oklahoma, had legalized liquor sales. In addition, a number of states in providing for the legal sale of liquor had left to the electorate of localities within the state the final determination concerning the legalization or prohibition of the sale of liquor within their communities. Thus about 16.3% of the population of the United States lives in "dry" areas.

In 1956 the 197 distilleries, 141 rectifying plants, 52 bottling plants, 1,500 wholesalers and approximately 200,000 retail outlets provided employment for an estimated 800,000 persons with annual payrolls estimated at more than \$2,000,000,000. During fiscal 1956, the federal government realized \$2,100,000,000 in spirits revenues. In addition, state and local governments collected almost \$620,000,000 from the manufacture and sale of distilled spirits during calendar 1955.

During fiscal 1956, 234,932,922 gal. of distilled spirits were produced in beverage distilleries, an increase of 28.9% over total spirits output in fiscal 1955. Included were 130,700,000 gal. of whisky and 68,400,000 gal. of neutral spirits, marking an increase of 25.8%

Table I.—U.S. Production of Distilled Spirits
(in proof gallons)

Fiscal year ending June 30	Whisky	Neutral spirits	Other (gin, rum, brandy, etc.)	Total
Average 1948-50	132,650,931	86,271,768	20,712,265	239,634,964
1951	205,702,460	173,025,280	22,725,056	401,452,796
1952	103,543,953	98,370,161	19,951,667	221,865,781
1953	66,765,449	47,358,809	20,341,494	134,465,752
1954	102,541,246	60,366,997	22,088,784	184,997,027
1955	103,927,044	53,277,317	24,985,920	182,190,281
1956	130,661,609	68,374,715	35,896,598	234,932,922

Source: Federal Alcohol and Tobacco Tax Division, U.S. Treasury Department.

Table II.—Inventories of Distilled Spirits in Internal Revenue Bonded Warehouses

(in proof gallons, before allowance for evaporation and leakage losses)

As of June 30	Whisky	Neutral spirits	Other (gin, rum, brandy, etc.)	Total
Three-year average				
1948-50	589,488,709	53,947,786	16,776,470	660,212,965
1951	751,233,178	134,816,711	15,056,299	901,106,188
1952	767,557,977	151,959,204	17,639,152	937,156,333
1953	730,919,161	133,504,123	17,390,180	881,813,464
1954	720,698,733	126,546,591	17,082,843	864,328,167
1955	715,860,858	110,160,340	15,474,805	841,496,003
1956	737,708,859	99,442,917	17,603,507	854,755,283

Source: Data of the Federal Alcohol and Tobacco Tax Division, U.S. Treasury Department.

in whisky production and an increase of 28.3% in neutral spirits output from 1955.

Total domestic bottled output in fiscal 1956 amounted to 185,389,480 gal. of which whiskies accounted for 141,991,554 gal. This was an increase in total spirits bottlings of 7.4% over 1955, and an increase in whisky bottlings of 2.2%.

Whiskies continued to dominate the total of domestic spirits entering consumption channels, constituting about 77% of the over-all total. Of the total increase in spirits bottled domestically of more than 12,000,000 gal., about two-thirds could be accounted for by increases in vodka and gin. Bottled output of brandy, cordials, liqueurs and rum showed relatively slight changes in fiscal 1956 over fiscal 1955. The output of vodka, however, rose sharply, increasing by 123%. Gin bottlings also showed a relatively sharp increase over fiscal 1955, rising by 14.4%. Bonded and straight whiskies constitute 40% of whisky bottlings in 1956, while the blends represented 60%.

During fiscal 1956, total bottled imports amounted to 25,999,-

Table III.—Bottled Imports
(in gallons)

Fiscal year ending June 30	Grand total	Total	Scotch	Whisky Canadian	Other whisky	Other spirits*
Three-year average						
1948-50	13,602,792	11,675,026	7,205,830	4,445,002	24,194	1,927,766
1951	19,877,646	16,769,635	10,376,713	6,355,674	37,248	3,108,011
1952	19,307,744	16,587,064	9,384,580	7,189,851	12,633	2,720,680
1953	20,140,693	17,269,117	9,380,281	7,884,133	4,703	2,871,576
1954	22,995,534	20,109,045	11,187,691	8,918,295	3,059	2,886,489
1955	23,102,060	20,378,741	11,642,128	8,729,356	7,257	2,723,319
1956	25,999,493	22,363,849	12,674,550	9,659,000	30,299	3,635,644

*Includes rum, gin, brandy, cordials and liqueurs.
Source: Data of the Distilled Spirits Institute.

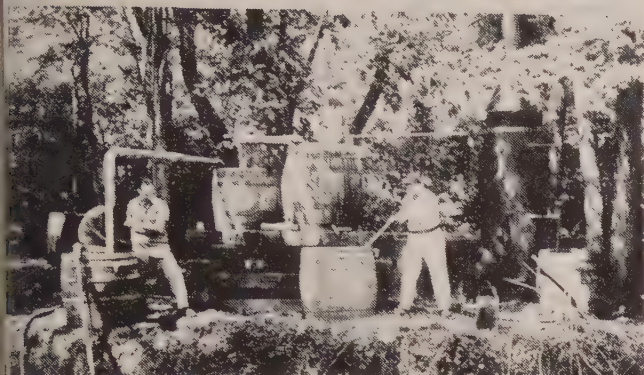
493 gal., marking an increase of 12.6% over fiscal 1955. Scotch and Canadian whiskies accounted for 85.9% of total imports. Although rum imports accounted for only 7.1% of total bottled imports, they constituted the bulk of United States rum con-

Table IV.—Domestic Bottlings of Spirits—by Type
(in wine gallons)

Fiscal year ending June 30	Grand total	Whisky	Brandy	Gin	Cordials and liqueurs	Vodka	Rum	Miscellaneous
Three-year average,								
1948-50	162,926,823	143,839,779	1,778,807	12,093,482	4,062,053	95,696	465,372	687,330
1951	195,364,357	167,508,763	2,832,056	17,494,804	5,411,974	95,696	680,775	440,289
1952	160,026,326	136,087,197	2,671,782	13,320,158	5,353,603	1,541,008	620,259	432,319
1953	175,190,496	144,150,785	3,035,514	18,061,708	6,058,278	2,722,843	725,003	436,365
1954	173,210,522	141,256,240	3,028,149	18,782,326	5,799,810	3,173,545	692,828	477,624
1955	172,639,613	138,999,660	3,409,392	18,794,731	5,752,229	4,563,704	666,448	453,445
1956	185,389,480	141,991,554	3,890,122	21,483,961	6,429,034	10,164,653	657,973	772,183

*Previous to 1951, vodka was included with miscellaneous.
Source: Data of the Federal Alcohol and Tobacco Tax Division, U.S. Treasury Department.

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CULAR distributed by the U.S. alcohol and tobacco tax division of the internal revenue service as authorities attempted to locate illegal stills in West Virginia in 1956

ption. During fiscal 1956, 1,855,046 gal. were imported, of which 1,635,781 gal. came from Puerto Rico. Brandy, liqueurs and gins accounted for an additional 1,780,598 gal. of the fiscal 1956 import total. In addition to the bottled imports, there were 252,669 gal. of bulk distilled spirits, including 413,011 gal. of whiskey, 469,974 gal. of rum and 425,092 gal. of brandy imported and bottling in the United States.

Per capita consumption of spirits in the United States during calendar year 1955 was 1.22 wine gallons.

The federal tax rate in 1956 amounted to about 43% of the selling price of a typical fifth bottle of whisky; with state and local levies added, 56% of the selling price went for taxes.

See also BREWING AND BEER; INTOXICATION, ALCOHOLIC; DRUGS.) (A. J. LI.)

Literary Prizes.

The following is a selected list of literary prizes awarded during the year 1956 and the latter months of 1955.

UNITED STATES.—ACADEMY OF AMERICAN POETS AWARD.—To Rolfe Humphries.—Lamont Poetry selection, to Philip Booth for *Letter From a Plant Land*.

AMERICAN ACADEMY OF ARTS AND LETTERS AND NATIONAL INSTITUTE.—Award of merit to Enid Bagnold for *The Chalk Garden*. Russell Loines awarded to John Betjeman. Prix de Rome fellowship to John Ciardi. Renewal Prix de Rome fellowship to Ralph Ellison.

AMERICAN POLITICAL SCIENCE ASSOCIATION.—Woodrow Wilson Foundation award of \$1,000 for the best book on government and democracy to Louis Hartz for *The Liberal Tradition in America*.

SPRINGFIELD-WOLF AWARDS.—Two awards of \$2,000 each for books in the field of race relations, administered by the *Saturday Review*, to John P. Sweeney and Alex Rosen for *A Manual of Intergroup Relations*, and to George Shepherd for *They Wait in Darkness*.

LANCROFT PRIZES.—\$2,000 each annually for the two best books in American history, American diplomacy or American international relations, Elizabeth Stevenson for *Henry Adams*, and to Richard N. Current and Randall for *Last Full Measure: Lincoln the President*.

HUNTINGTON PRIZE IN POETRY.—\$1,000 to Conrad Aiken for *A Letter to Li Po, and Other Poems*.

JOHN BURROUGHS MEDAL.—To Guy Murchie, Jr., for *Song of the Sky*. CATHOLIC BOOK CLUB.—Campion award to honour long-standing and eminent service in the cause of Catholic letters, to Helen C. White.

CHRISTOPHER AWARDS.—Bronze medallions, awarded semiannually, to Ira Avery for *The Five Fathers of Peppi*; Ruth Cranston for *The Miracle of Lourdes*; Rumer Godden for *An Episode of Sparrows*; Budd Schulberg for *Waterfront*; Agnes Turnbull for *The Golden Journey*; Sen. John F. Kennedy for *Profiles in Courage*; Adele Comandini for *Doctor Kate*; Thomas Dooley for *Deliver Us From Evil*; and to George Mardikian for *Song of America*.

COMMONWEALTH CLUB OF CALIFORNIA.—Gold medal to Allan Temko for *Notre-Dame of Paris* (nonfiction) and to C. S. Forester for *The Good Shepherd* (fiction). Silver medals to Carl Bridenbaugh for *Cities in Revolt*; Aldous Huxley for *Genius and the Goddess*; and Samuel Dickson for *Streets of San Francisco*. Silver medals (special) to Delina Margot-Parle for *Symphony* (poetry); Irene D. Paden and Margaret E. Schlichtman for *The Big Oak Flat Road* (California history). Honourable mention to Leon J. Richardson for *Singing in Sunshine* (poetry).

DELL-WESTERN AWARD.—\$1,000 for the best western novel, reprint or original, published by Dell Publishing company, to Will C. Brown (C. S. Boyles, Jr.) for *The Border Jumpers*.

FRIENDS OF AMERICAN WRITERS.—\$1,000 annual award to a midwestern writer, to Carol Brink for *The Headland*.

ROBERT FROST FELLOWSHIP IN POETRY.—Tuition, board and room at Middlebury College Breadloaf Writers' conference, sponsored by Henry Holt and Company, to Herbert A. Kenny.

GUGGENHEIM FELLOWSHIPS.—Among those awarded fellowships were Edward Charles O'Gorman, Margaret Kirkland Avison, David Russell Wagoner, Donald Earl Wetzel, David Karp, Frank Rooney, Harry Miles Muheim, Thomas Hal Phillips and Barbara Francesca Gibbs Golfing for creative writing.

HARPER'S EUGENE F. SAXTON FELLOWSHIPS.—To Nick Joaquin y Marques, for completion of a novel, an account of three generations of Philippine history.

HUNTINGTON HARTFORD FOUNDATION AWARDS.—\$500 and an invitation to live six months at the foundation estate, to Edward Hopper, painter, and Ernst Toch, composer.

SIDNEY HILLMAN FOUNDATION PRIZE AWARD.—To John Lord O'Brian for *National Security and Individual Freedom*.

INSTITUTE OF EARLY AMERICAN HISTORY AND CULTURE AWARD.—\$500 to Alan Simpson for *Puritanism in Old and New England*.

JEWISH BOOK COUNCIL AWARDS.—Harry and Ethel Daroff Memorial Fiction award of \$250 to Jo Sinclair for *The Changelings*. Harry Kovner Memorial awards of \$100 each to Hillel Bavli for a book of Hebrew poetry, and to the Yiddish poet Naphtali Gross for cumulative contribution to Yiddish poetry.

MEDIAEVAL ACADEMY OF AMERICA.—Haskins medal to Ernest A. Moody for *Truth and Consequence in Medieval Logic*.

MYSTERY WRITERS OF AMERICA AWARD.—Honorary "Edgars," busts of Edgar Allan Poe, awarded for mystery writing: for best mystery novel, to Margaret Millar for *Beast in View*; best first mystery novel, to Lane Kauffmann for *The Perfectionist*; best short story to Philip MacDonald for *Dream No More*; best fact-crime to Manly Wade Wellman for *Dead and Gone*; annual "Raven" to Charles Scribner's Sons for consistently excellent book jackets in the mystery-suspense field.

NATIONAL BOOK AWARDS.—Gold medals awarded by the entire book industry: for distinguished fiction, to John O'Hara for *Ten North Frederick*; for nonfiction, to Herbert Kubly for *Americans in Italy*; for poetry, to W. H. Auden for *The Shield of Achilles*.

NATIONAL BROTHERHOOD AWARD.—To John Lord O'Brian, for *National Security and Individual Freedom*.

NATIONAL INSTITUTE OF ARTS AND LETTERS.—\$1,000 grants to seven nonmember authors, to James Baldwin, John Cheever, Henry-Russell Hitchcock, Joseph Kerman, Josephine Miles, Priscilla Robertson and Frank Rooney.

NATIONAL LEAGUE OF AMERICAN PEN WOMEN AWARD.—For best book of poetry by a member of the league, to Jane Merchant for *The Greatest of These*.

NEW YORK DRAMA CRITICS CIRCLE AWARD.—For best play, to Frances Goodrich and Albert Hackett for adaptation of *Diary of a Young Girl* by Anne Frank; best foreign play, to Christopher Fry for *Tiger at the Gates*; best musical, to Alan Jay Lerner and Frederick Loewe, for *My Fair Lady*.

POETRY MAGAZINE AWARDS.—Levinson prize to Stanley Kunitz; Oscar Blumenthal prize to Sydney Goodsir Smith; Eunice Tietjens prize to Mona Van Duyn; Harriet Monroe Memorial prize to David Jones; Bess Hokin prize to Charles Tomlinson; Union League Civic and Arts Foundation prize to Jean Garrigue; Vachel Lindsay prize to Hayden Carruth.

POETRY SOCIETY OF AMERICA AWARDS.—Alexander Drutzkoy Memorial award of gold medal and \$100 to Louis Untermeyer; Walt Whitman award of \$200 to Gay Wilson Allen; Reynolds Lyric award of \$200 to William D. Barney; Edna St. Vincent Millay Memorial award of \$200 to Donald Hall; William Rose Benet Memorial award of \$100 to Norman Nicholson; Ridgely Torrence Memorial award of \$100 to Adrienne Cecile Rich; Poetry Chap-Book award of \$100 to Thomas H. Johnson; Emily S. Hamblen Memorial award of \$100 to Stanley Gardner. Annual award of \$100 to Virginia Earle; second prize of \$50 to Gustav Davidson. Also Borestone Mountain Poetry awards: \$1,250 to Rolfe Humphries; \$250 each to Phyllis McGinley and Robert Hillyer; \$100 to Alastair Reid.

TAMMINGTON INSTITUTE BOOK AWARD.—\$500 for best American biography, to James MacGregor Burns for *Roosevelt: The Lion and the Fox*.

TEXAS INSTITUTE OF ARTS AND LETTERS AWARDS.—Carr P. Rollins award of \$1,000 for best Texas book of the year, to John S. Spratt for *The Road to Spindletop*; *Economic Change in Texas, 1875-1901*; Summerfield G. Roberts award of \$1,000 for the best book about the Republic of Texas, to Bessie Lee Fitzhugh for *Bells Over Texas*; Dallas Museum of Fine Arts award of \$25 for book design, to Carl Hertzog, publisher; McMurray Bookshop award of \$250 for the best first novel to Fred Gipson for *Recollection Creek*; A. Harris Poetry award of \$100 to William D. Barney.

WESTERN WRITERS OF AMERICA AWARDS.—Silver Spurs for best western novel, to L. P. Holmes for *Somewhere They Die*; best nonfiction award to Paul F. Sharp for *Whoop-Up Country*; best western short story to S. Omar

Barker for *Bad Company*.

THE WESTERNERS, NEW YORK POSSE, AWARD.—For best western book, to Mark H. Brown and W. R. Felton for *The Frontier Years*.

YALE SERIES OF YOUNGER POETS AWARD.—To James Wright for *The Green Wall*.

ZONDERVAN CHRISTIAN TEXTBOOK AWARD.—\$1,500 to R. Laird Harris for *The Inspiration and Canonicity of the Bible*.

NOBEL PRIZE FOR LITERATURE.—(See article NOBEL PRIZES.)

PULITZER PRIZES.—(See article PULITZER PRIZES.)

U.S. Children's Books.—JANE ADDAMS CHILDREN'S BOOK AWARD.—For a book which embodies the spirit of world understanding and friendship, to Anna Bontemps for *Story of the Negro*.

HANS CHRISTIAN ANDERSEN MEDAL.—International award on books for young people, to Eleanor Farjeon for *The Little Bookroom*.

BOYS' CLUBS OF AMERICA JUNIOR BOOK AWARDS.—Carolyn Haywood for *Eddie and His Big Deals*; Patrick Pringle for *Great Discoverers in Modern Science*; Ray Bradbury for *Switch on the Night*; Edwin Tunis for *Wheels*; Natalie Savage Carlson for *Wings Against the Wind*.

CALDECOTT MEDAL.—For the year's most distinguished American picture book for children, to Feodor Rojankovsky for *Frog Went A-Courtin'*.

CHICAGO CHILDREN'S READING ROUND TABLE AWARD.—For distinguished service in the field of children's reading, to Dilla MacBean.

CHILD STUDY ASSOCIATION OF AMERICA CHILDREN'S BOOK AWARDS.—To Taro Yashima (Jun Iwamatsu) for *Crow Boy* and Virginia Sorensen for *Plain Girl*.

COMMONWEALTH CLUB OF CALIFORNIA.—Silver medal for best juvenile, to Frederick A. Lane for *Westward the Eagle*; honorable mention to Marion Garthwaite for *You Just Never Know*.

DODD MEAD-BOYS' LIFE AWARD.—\$2,000 plus royalty, to Marian Talmadge and Iris Gilmore for *Pony Express Boy*.

DODD MEAD-COMPACT AWARD.—To Alexander L. Johnson for *Oasis for Lucy*.

THOMAS ALVA EDISON FOUNDATION NATIONAL MASS MEDIA AWARDS.—\$250 and a scroll each to Hazel Wilson for *His Indian Brother* (best children's book for character portrayal); John Lewellen for *The Boy Scientist* (best children's science book); and Virginia S. Eifert for *The Buffalo Trace* (youth book best portraying America's past).

HELEN DEAN FISH AWARD.—\$500 for best first book, to Aylesa Forsee for *The Whirly Bird*.

JEWISH BOOK COUNCIL.—Award of \$250 for cumulative contribution to Jewish juvenile literature to Sadie Rose Weilerstein.

NEWBERRY MEDAL.—For the year's most distinguished contribution to American literature for children, to Jean Lee Latham for *Carry On, Mr. Bowditch*.

NEW YORK HERALD-TRIBUNE CHILDREN'S SPRING BOOK FESTIVAL AWARDS.—Three prizes of \$200 each: for a picture book, to William Pene du Bois for *Lion*; for middle-age group, to Rutherford G. Montgomery for *Beaver Water*; for older children, to Richard Armstrong for *Cold Hazard*.

OHIOANA AWARD.—For best juvenile, to James Flora for *The Fabulous Firework Family*.

SECONDARY EDUCATION BOARD AWARDS.—For ten best adult titles suitable for pre-college readers: MacKinley Kantor for *Andersonville*; James Bishop for *The Day Lincoln Was Shot*; Rumer Godden for *Episide of Sparrows*; Edward Steichen for *The Family of Man*; Richard Aldrich for *Gertrude Lawrence as Mrs. A.*; Anne Morrow Lindbergh for *Gift From the Sea*; C. S. Forester for *The Good Shepherd*; John Gunther for *Inside Africa*; Gerald M. Durrell for *Three Tickets to Adventure*; and Virginia Pasley for *Twenty-One Stayed*.

TEXAS INSTITUTE OF ARTS AND LETTERS.—Cokesbury Book Store award for best Texas juvenile, to Fred Gipson for *The Trail-Driving Rooster*.

WILLIAM ALLEN WHITE AWARD.—To Marguerite Henry for *Brightly of the Grand Canyon*.

Canada.—GOVERNOR GENERAL'S AWARDS.—Fiction, to Lionel Shapiro for *The Sixth of June*; creative nonfiction, to N. J. Berrill for *Man's Emerging Mind*; academic nonfiction, to D. G. Creighton for *John A. Macdonald, the Old Chief*; poetry, to Wilfred Watson for *Friday's Child*; juvenile, to Kerry Wood for *The Map-Maker: The Story of David Thompson*.

LEACOCK MEDAL FOR HUMOUR.—To Eric Nichol for *Shall We Join the Ladies?*

LORNE PIERCE MEDAL OF THE ROYAL SOCIETY OF CANADA.—For a contribution to the development of Canadian literature, to Thomas H. Raddall.

PIERRE CHAUVEAU MEDAL.—For Canadian literary production of a high order, to Victor Morin.

PRESIDENT'S MEDALS.—Short story, to Eva Lis Wuorio for *Call Off Your Cats*; single poem, to Louis Dudek for *Keewaydin Poems*; general article, to Ralph Allen for *The Land of Eternal Change*; scholarly article, to D. M. Stanley for *Kingdom to Church*.

TYRRELL MEDAL OF THE ROYAL SOCIETY OF CANADA.—For outstanding contributions to the study of Canadian history, to Monseigneur Olivier Maurault.

UNIVERSITY OF BRITISH COLUMBIA MEDAL.—For popular biography, to D. G. Creighton for *John A. Macdonald, the Old Chief*. (A. J. RR.)

Great Britain.—Among awards made in 1956 were: JAMES TAIT BLACK MEMORIAL PRIZES for 1955 (about £250 each) to Ivy Compton-Burnett for *Mother and Son* (fiction) and Robert Wyndham Ketton-Cremer for *Thomas Gray* (biography); ARTS COUNCIL AWARDS for original verse to R. S. Thomas for *Song at the Year's Turning* (1955), to J. P. Fletcher for *Tally 300* (1956) for a first book of original verse and to W. Watson for *Friday's Child* (1955); the ARTS COUNCIL SCOTTISH PRIZE for poetry to Robert McLellan for his poem *Sweet Largie Bay*; CAFÉ ROYAL PRIZE (first prize £300) to Laurence Henry Forster Irving for a book on his grandfather, *Henry Irving: The Actor and His World* (1955); the QUEEN'S GOLD MEDAL for poetry to Edmund Blunden; the SOMERSET MAUGHAM TRUST PRIZE to Elizabeth Jennings for *A Way of Looking* (1955). Charles Whiting, author of *The Frat Wagon* (1954) and *Lest I Fall* (1956), was the first winner of the DOWTY AWARD "to enable a writer under 35 to travel in Canada." Other prizes included the HANS CHRISTIAN ANDERSEN PRIZE and the LIBRARY ASSOCIATION CARNEGIE MEDAL, both to Eleanor Farjeon for *The Little Bookroom* (1955); the FOYLE PRIZE to Laurie Lee for *My Many Coated Man* (1955); the W. H. HEINEMANN FOUNDATION

PRIZES for literature to R. S. Thomas for *Song at the Year's Turning* (1955), V. Cronin for *The Wise Man From the West* (1955) and to R. Ketton-Cremer for *Thomas Gray*; the JOHN LLEWELYN RHYS MEMORIAL PRIZE to John Hearne for *Voices Under the Window* (1955); the SUNDAY TIMES LITERARY PRIZE (£1,000) and GOLD MEDAL to Alan Moorehead for *Gallipoli* (1956). (X.)

France.—The principal literary prizes awarded during 1956 were: 1. GRAND PRIX LITTÉRAIRE DE LA VILLE DE PARIS to Louis Madelin for his historical work as a whole; the PRIX LITTÉRAIRE PRINCE RAINIER to Monaco to Marcel Brion for his work as a whole; the GRAND PRIX NATIONAL DES LETTRES to Alexandre Arnoux of the Académie Goncourt for his work as a whole; the PRIX DE LA FONDATION DEL DUCA to Alain Robl Grillet for *Les gommages et le voyeur* and to Maurice Guy for *L'Enseignement*; the PRIX ALBERT LONDRES (reporting) to René Maurières; the PRIX DE CRITIQUES to Michel Leiris for *La règle du jeu*; the PRIX DE L'HUMOUR to Paul Guimard for his *Faux frères*; the GRAND PRIX LITTÉRAIRE de l'ACADÉMIE FRANÇAISE to Henri Clouard for his *Histoire de la littérature française du symbolisme à nos jours*; the PRIX DU ROMAN de l'ACADÉMIE FRANÇAISE to Paul Guth for his work as a whole; the PRIX DES AMBASSADEURS to Jacques Chastenot for *Winston Churchill*.

According to tradition, the year's four outstanding prizes were announced in December; the PRIX FEMINA was awarded to François-Régis Basti for his novel *Les Adieux*; the PRIX GONCOURT to Romain Gary for *Le racines du ciel*; the PRIX RENAUDOT to André Perrin for *Le Père*; the PRIX INTERALLIÉ to Armand Lanoux for *Le Commandant Watrin*. (A. PR.)

Literature: see AMERICAN LITERATURE; BOOK PUBLISHING AND BOOK SALES; CANADIAN LITERATURE; ENGLISH LITERATURE; FRENCH LITERATURE; GERMAN LITERATURE; ITALIAN LITERATURE; JEWISH LITERATURE; LATIN-AMERICAN LITERATURE; LITERARY PRIZES; NOBEL PRIZES; PULITZER PRIZES; RUSSIAN LITERATURE; SPANISH LITERATURE.

Lithuania. A Soviet Socialist republic, Lithuania is bounded north by Latvia, east and southeast by Byelorussia, south by Poland and the Russian Kalinin oblast (province) and west by the Baltic sea. Area: 31,200 sq.mi. Pop. (1956 est.) 2,700,000. Languages (1954 est.): Lithuanian 73%; Russian and other Soviet 17%; Polish 10%. Religions (1954 est.): Roman Catholic 81%; Protestant 2.5%; Orthodox 2.5%; other no religion 14%. Chief towns (pop., 1956 est.): Vilnius 472,000; Wilno (cap.) 200,000; Kaunas 195,000; Klaipeda or Memel (1939 est.) 47,200. First secretary of the Lithuanian Communist party in 1956, Antanas Snieckus; chairman of the presidium of the supreme soviet, Justas Paleckis; chairman of the council of ministers, Moteius Juozovic Sumauskas.

History.—Capital investments in Lithuanian industry amounted to 1,500,000,000 roubles under the five-year plan 1955-59. Among the important enterprises built during that period were a turbine works, a machine-tool factory, three electric engineering industry factories, a large brick works and a cement plant. In 1956 Lithuania generated about 350,000,000 kw.hr. of electricity, eight times more than in 1940; that figure would be doubled when the Petrasunai hydroelectric power station, now under construction, was completed. The number of workers in the industry almost doubled between 1950 and 1955.

Mecislovas Gedvilas, premier since 1943, was relieved of his post on Jan. 15, 1956, and replaced by Moteius Juozovic Sumauskas. Complaints about the political situation in Lithuania voiced in the Soviet press insisted that there was still much "bourgeois nationalism."

In 1956 there were in Lithuania 30 secondary and 326 primary Polish schools; there was also a Polish teachers' training college and a higher pedagogical institute. It was estimated that in 1956 the population of Vilnius comprised 90,000 Russians, 60,000 Lithuanians, 40,000 Jews and 10,000 Poles.

(See also ESTONIA; LATVIA.)

(K. SM.)

Education.—Schools (1955): primary 3,200, pupils 430,000; secondary 110, pupils 35,000; vocational 230, pupils 215,000; institutions of higher education 14, students, about 15,000.

Finance.—Budget: (1955 est.) balanced at 1,644,514,000 roubles (1956) balanced at 1,908,122,000 roubles.

Agriculture.—Main crops (metric tons, 1938): rye 623,700; wheat 253,300; barley 274,000; oats 420,000; potatoes 2,118,200; flax fibre 25,800. Livestock (1939): cattle 1,103,600; pigs 1,117,100; sheep 1,223,600; horses 520,700; poultry 1,996,800.

Livestock. Livestock and poultry on United States farms and ranches at the beginning of 1956 showed a net increase of about 2% over the previous year. Meat animals increased, while milk cattle, poultry and work stock decreased. Aggregate value for all seven livestock species on Jan. 1 was \$10,757,612,000.

The U.S. imported 314,377 head of cattle in 1955, including 147,751 from Mexico and 66,603 from Canada. Exports, largely breeding stock, amounted to 24,505 head of cattle, 26,113 of sheep and 4,378 hogs.

Table I.—Livestock on U.S. Farms
(In 000 head)

Animals	Jan. 1, 1956	Jan. 1, 1955	Average, 1945-54
Horses and mules	3,962	4,309	8,212
Cattle (including calves)	97,465	96,592	84,040
Milk cows	23,318	23,462	24,654
Sheep	31,109	31,582	34,736
Hogs	55,088	50,474	56,853
Poultry	382,218	390,708	449,640
Swine	4,892	4,917	5,533

The 97,465,000 head of cattle on farms early in 1956 were valued at \$8,581,370,000 or \$88 per head, approximately the same as in 1955. Although the average price to producers for all cattle had declined to \$15.30 per hundredweight in October, the best fat cattle, which had brought less than \$25 per hundredweight early in the year, had risen to as much as \$34 per hundredweight. The calf crop of 1956 was indicated at 43,272,000 head, 2% larger than in 1955.

The lowest hog prices since 1941 in the late autumn of 1955, together with a related unfavourable corn-hog price ratio, resulted in a reduction of about 8% in the pig crop of 1956. The spring pig crop was 53,085,000 head, as compared with 57,690,000 head a year earlier; the fall crop was estimated at about 1,000,000 head. From a low of \$10.60 per hundredweight received by producers in Dec. 1955, the price climbed seasonally to \$16.20 per hundredweight in August, then again declined below \$15 per hundredweight. Meanwhile, a price support program involving a purchase of pork and lard, which had been suspended in April after purchases of nearly 200,000,000 lb. at a cost of nearly \$100,000,000, was reopened late in October. Because of a harvesttime decline in corn prices, the corn-hog price ratio in Oct. 1956 was 13 to 0, not far below the long-time average; there were some forecasts of moderate expansion in 1957 pig crops.

The 27,009,000 head of stock sheep on farms at the beginning of 1956 resulted from a slightly smaller 1955 lamb crop plus a 2% larger slaughter in 1955. Values also declined in total to \$85,375,000, as compared with \$403,524,000 a year earlier; on a per head basis the decline was from \$14.90 to \$14.30. The 1956 lamb crop included 20,428,000 head, 1% more than in 1955.

Pullets on U.S. farms at the beginning of 1956 were down 7% from breeder turkey hens were increased 7% over a year earlier. Commercial hatcheries produced 1,743,416,000 chicks during the first nine months of 1956, an increase of 15% as compared with 1,511,808,000 during the same months of 1955. Chickens raised on farms in 1956 were estimated at 471,917,000 or 2% more than the record low 461,868,000 produced in 1955 but 28% below the decade average. Heavy breed turkey poult hatched during the first nine months of 1956 totalled 65,108,000, an increase of 28% as compared with 1955. Light breeds for the same period were reduced to 12,525,000 from 14,137,000 in 1955.

World cattle numbers totalled 917,600,000 head at the beginning of 1956, a new record high, 1% larger than a year earlier, 2% above the early postwar (1946-50) average and 22% more than prewar. World sheep numbers increased for the ninth consecutive year to 909,600,000 head at the beginning of 1956, 2% more than a year earlier and 22% above prewar. All major regions except North America participated in the expansion.

Table II.—Number of Livestock in Specified Areas
(In 000 head at beginning of year)

Areas	Cattle		Hogs		Sheep	
	1956	1955	1956	1955	1956	1955
North America	135,100	133,800	74,400	69,100	39,000	39,400
Europe	106,700	105,900	95,800	95,000	122,500	121,200
U.S.S.R.	64,900	64,900	23,200	23,200	124,900	124,900
Asia	342,500	341,800	102,800	102,700	184,600	182,400
South America	148,300	145,700	43,200	45,600	130,000	129,400
Africa	97,400	97,400	3,900	3,900	128,500	126,300
Oceania	22,600	22,100	2,200	2,200	177,000	170,000
Estimated world total	917,600	911,600	373,300	369,500	909,600	893,600

World hog numbers increased to an all-time record high of 373,300,000 at the beginning of 1956, about 1% more than a year earlier, 27% above prewar and 52% more than average for the early postwar period (1946-50).

World work stock numbers generally declined in competition with the tractor: horses to fewer than 59,000,000 as compared with 74,700,000 prewar, mules to about 15,000,000 against 18,400,000 before the war. Camels increased in Africa and Asia to 10,000,000, as compared with 7,800,000 head prewar.

(See also AGRICULTURE; MEAT; WOOL.) (J. K. R.)

ENCYCLOPEDIA BRITANNICA FILMS.—*Improving Strains of Livestock* (application of genetic principles) (1954); *Cattleman* (1939).

Livestock Shows: see SHOWS.

Local Government: see MUNICIPAL GOVERNMENT.

Lodge, Henry Cabot, Jr. (1902—), U.S. delegate to the United Nations, was born on July 5 at Nahant, Mass., the grandson of Sen. Henry Cabot Lodge who led the opposition to U.S. entry into the League of Nations. He was graduated from Harvard university in 1924 and worked first with the *Boston Evening Transcript* and later with the *New York Herald Tribune* until 1932. He was a representative to the Massachusetts general court from 1933 to 1936 and in the latter year was elected U.S. senator from Massachusetts on the Republican ticket. Re-elected in 1942, he resigned in Feb. 1944 to go on active duty with the U.S. army, and saw combat in North Africa and Italy. He was again elected to the senate in 1946.

Lodge directed the strategy that resulted in Dwight D. Eisenhower's nomination at the Republican national convention in July 1952, but he himself was defeated in the election for the senate. President Eisenhower named him as U.S. representative to the United Nations, to succeed Warren R. Austin, and he took office on Jan. 23, 1953.

Lodge's principal tasks in the UN during 1953 and 1954 were to counter soviet propaganda and attempts to split the western powers, and to combat the continued efforts of the soviet bloc to secure admission of Red China to the UN. Much of his time during 1955 was spent on efforts to secure release of 11 U.S. air-men imprisoned by China as "spies," to persuade the U.S.S.R. to participate in a world atomic energy pool for peaceful purposes, and to present the U.S. view on disarmament before the UN subcommittee on disarmament, meeting at New York city. His proposal, advanced in April 1956, that at least part of the United States' foreign aid funds be distributed through the United Nations to forestall competition between the U.S. and the U.S.S.R., was opposed by President Eisenhower.

London. London is the capital of the United Kingdom of Great Britain and Northern Ireland and the centre of the Commonwealth of Nations. The term "London" is used here to describe three areas: (1) the City, the ancient heart of London, which for some purposes functions as a county; (2) the administrative county, comprising the City and the county proper (which consists of 28 metropolitan boroughs); and (3) Greater London, embracing the City, the county proper and the suburbs as far as the borders of the Metropolitan police area; i.e., includ-



FORMER PREMIER GEORGI MALENKOV of the U.S.S.R. signing autographs during his visit to London and other British cities in 1956. Officially Malenkov was sent on an inspection tour of British power plants

ing Middlesex and parts of Essex, Kent, Surrey and Hertfordshire. *City*. Area 1.05 sq.mi.; night pop. (1951 census) 5,268. Lord mayors in 1956: Sir Cuthbert Ackroyd and (from Nov.) Sir Cullum Welch. *County*. Area (including City) 116.95 sq.mi.; pop. (1951) 3,348,336. Lord lieutenant, Field Marshal Viscount Alanbrooke; chairman of London County council, N. Prichard. *Greater London*. Area about 722 sq.mi.; pop. (1951) 8,348,023.

There were several important developments during 1956 in the architectural battle for the future of London. These included plans for providing St. Paul's cathedral with a more fitting background and the proposal to attempt a large-scale fundamental re-planning of the area known as the Barbican. The St. Paul's plan was drawn up by Sir William Holford and consisted chiefly of a series of open spaces around the cathedral including a "semi-formal paved forecourt" and a "large stretch of sheer lawn."

The plan for rebuilding between Aldersgate street and Moorfields, known as the New Barbican scheme, had elements of science fiction about it since it suggested not only a system of linked skyscrapers but the provision of working, administrative and residential areas on three different levels and a form of town planning much more radical than in any scheme hitherto accepted in London. It was rejected by the minister of housing and local government, with the concurrence of both the City and the London County council.

There was much interest in the proposal to demolish the Imperial institute in South Kensington and replace it by a huge new group of buildings needed for the expansion of the Imperial college of science. The main objection to the proposal was that the Imperial institute buildings (designed by Collcutt) included a particularly fine tower, one of the landmarks of Kensington, and this objection proved fatal to the scheme.

First moves were made toward clearing a large site on the south bank of the Thames, near Waterloo railway station, for a group of buildings, including a 25-story office block, which would transform the appearance of this part of London.

The first moves were also made toward carrying out a big scheme for widening the Strand at its western end. When completed this would involve partly cutting off the forecourt of Charing Cross railway station and perhaps demolishing the Charing Cross itself, which is a replica of an older monument to Queen Eleanor, consort of Edward I.

(G. Fy.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*The British Isles* (1948); *Canals of England* (1952); *England* (1955); *London* (1955); *Picture of Britain* (1955).

Los Angeles. The city of Los Angeles officially ranked third in population among the cities of the United States in 1956. A special federal census taken in the spring established its population at 2,243,901, exceeded only by New York and Chicago. This was an increase of 273,543 over the 1,970,358 persons recorded in the regular census of 1950. Los Angeles covers an area of 454.7 sq.mi. It functions under a mayor and council form of government. The mayor in 1956 was Norris Poulson.

The city's budget for the 1956-57 fiscal year totalled \$37,027,907. The city property tax rate stood at \$1.9007 on each \$100 of assessed valuation. General obligation bonds outstanding at June 30, 1956, totalled \$183,990,000. All bonds were issued and retired as serial bonds, eliminating the need for sinking funds. Bonds authorized but unsold amounted to \$72,200,000.

Enrolment in the public schools of the Los Angeles city school district, which extends beyond the city limits, was 473,000 as of Sept. 1956. Enrolment in private schools at the beginning of the year was 74,437. Adult education classes had an enrolment of approximately 47,000.

The annual value of manufactures for the Los Angeles metropolitan area, consisting of Los Angeles and Orange counties, was approximately \$6,000,000,000, placing it third for nation's metropolitan areas. At midyear there were 2,361,200 employed and 68,500 unemployed in manufacturing and industry in the metropolitan area.

Foreign commerce for the year ended June 30, 1956, amounted to 5,002,974 tons, of which 2,422,890 tons were exports and 2,580,084 tons were imports.

New industrial investment for 1956 for the metropolitan area was expected to exceed \$300,000,000. Retail sales were expected to reach an estimated \$8,300,000,000, an increase of about 4% over 1955. The valuation of building permits issued in the city alone during 1956 was expected to be approximately \$483,000,000, which would be about \$50,000,000 more than the 1955 total.

At a special election in June, the voters overwhelmingly approved a \$59,700,000 bond issue for the expansion of Los Angeles International airport. Bonds amounting to \$50,000,000 for expansion of the city's sewer system, including construction of a new ocean outfall line, were sold during the 1955-56 fiscal year. Also sold were \$2,000,000 worth of bonds for new fire stations.

Increasing public demand for stricter controls on air pollution was apparent during the year. Enforcement of the anti-smoke laws is the responsibility of the Los Angeles county air pollution control district, which is under the supervision of the county board of supervisors. The primary sources of air pollution in the Los Angeles area are threefold—industry, incinerators and motor vehicles. Although active research had been under way for three years, no satisfactory device at a reasonable price to control motor vehicle exhaust fumes had been developed. The board of supervisors placed a deadline of Oct. 1, 1957, on the use of backyard and domestic incinerators. Controls on the contribution by industry to air pollution were stiffened during the year.

On Sept. 4 the city of Los Angeles observed the 175th anniversary of its founding by a small group of settlers from Mexico. In midyear the Civic Auditorium and Music Center association, a nonprofit organization of community leaders, announced plans for construction on a downtown site of a \$50,000,000 civic auditorium and music centre. Construction was started on an \$8,200,000 auditorium with a seating capacity of 21,000 for sports events and 35,000 for conventions.

Among the well-established cultural activities which were

continued in 1956 were Symphonies Under the Stars at Hollywood Bowl, the programs of the Los Angeles Philharmonic orchestra, the Pilgrimage Play and the Greek Theater productions in Griffith park.

(N. P.)

ENCYCLOPEDIA BRITANNICA FILMS.—*California* (1955); *Far Western States*, 2nd ed. (1956).

Louisiana. One of the west south central states of the United States, admitted to the union in 1812 as the 18th state, Louisiana is popularly known as the "Pelican state," "Crescent state" or "Bayou state." Area 48,523 sq.mi., of which 45,162 sq.mi. is land. Pop. (1950 census): 2,683,516, of which 1,796,548 or 67% were white and 886,968 or 33% nonwhite; 1,471,696 or 54.8% urban and 1,211,820 or 45.2% rural. The provisionally estimated population on July 1, 1956, was 3,004,000. Capital (pop. 1950), Baton Rouge, 125,629. Other important cities (with 1950 pop.): New Orleans 570,445, Shreveport 127,206, Lake Charles 41,272, Monroe 38,572, Alexandria 34,913, Lafayette 33,541.

History.—The Democratic state primary election was held on Jan. 17, 1956, and was a contest between "Long" and "anti-Long" factions. Former Gov. Earl K. Long sought the governorship on a platform of economy, no new taxes, increased aid to the aged, the needy and public education, and criticism of the policies of the incumbent administration of Robert F. Kennon. Anti-Long forces were unable to unite in support of a gubernatorial candidate, but Mayor deLesseps S. Morrison of New Orleans was that faction's strongest candidate. None of the five gubernatorial candidates openly supported aspirants for all other state offices, several of whom ran as independents. To the surprise of many, Earl K. Long received a majority of the total votes. Veteran state treasurer A. P. Tugwell was unopposed for renomination; the secretary of state, Wade O. Martin, Jr., easily won renomination, as did the superintendent of education, Shelby M. Jackson; and Lucille May Grace, former register of land office, also was nominated. Lether E. Frazar and William J. Dodd, Long candidates for lieutenant governor and auditor, respectively, were declared the nominees when their leading opponents declined to enter a second primary. This left only Jack P. F. Gremillion and Sidney J. McCrory, Long candidates for attorney general and commissioner of agriculture and immigration, respectively, confronted with a second primary against Fred S. LeBlanc and Dave L. Pearce, incumbents and runners-up for those offices. The Long faction insisted that no second primary was required when a gubernatorial candidate received a majority, but that candidates receiving the largest vote for all the lesser state offices automatically became the party nominees, while the anti-Long faction maintained that a second primary was mandatory for all offices when no candidate received a majority, unless the runners-up withdrew from the contest. The primary election laws were ambiguous on that point, and LeBlanc and Pearce carried the matter to the state supreme court, which agreed with the Long interpretation of the law and declared Gremillion and McCrory the party nominees. The April general election was a mere formality in the predominantly Democratic state.

The legislature met in regular 60-day biennial session on May 14, and the new state officers were inaugurated the next day. Despite campaign promises to the contrary, Governor Long proposed some new taxes and increased rates on some existing ones, with the explanation that the outgoing administration had depleted the treasury of the anticipated large surplus, making additional revenue necessary to finance his program. The governor's tax-raising program was blocked by a constitutional amendment adopted under the preceding administration, requiring a two-thirds vote in both houses of the legislature to pass any bill levying a new tax or increasing the rate of an existing one. The

governor was unable to obtain the required two-thirds vote for any of his tax bills. While the legislature rejected all tax increases, it passed a bill fixing a higher salary schedule for teachers and many other bills calling for large appropriations, as well as one increasing the legislators' own compensation from \$30 to \$50 per day. Being denied new sources of revenue, the governor was forced to veto many bills carrying appropriations for worthy projects, in order to balance the budget. However, substantial increases for public education, highways and welfare were incorporated in the general appropriation bill.

The legislature passed 48 proposed constitutional amendments for submission to the voters, and also a proposal for a convention to frame a new constitution. The most controversial of the proposed amendments was that repealing the requirement of a two-thirds vote in the legislature to pass tax bills, which had stymied Governor Long's program for tax increases. Opposition to its repeal mounted so rapidly that the governor convened the legislature on Aug. 30, in a 12-day special session, primarily for the purpose of withdrawing that amendment. The legislature withdrew the controversial amendment and passed a bill slightly increasing the tax on pari-mutuel betting at race tracks.

In the general election of Nov. 6, Louisiana's electoral votes went to the Republicans—for the first time since 1876—with a plurality of 85,000. All eight Democratic congressmen were re-elected, only two having Republican opposition; and Sen. Russell B. Long was re-elected. The proposal for a constitutional convention, sponsored by Governor Long, was rejected by a six-to-one vote; and only one of the ten proposed constitutional amendments which he specially favoured was approved. Of the 48 proposed constitutional amendments, 23 were approved and 25 rejected; those approved were mostly of local rather than state-wide interest.

State officers in 1956 (after May 15) were: Earl K. Long, governor; Lether E. Frazar, lieutenant governor; Wade O. Martin, Jr., secretary of state; A. P. Tugwell, treasurer; William J. Dodd, auditor; Jack P. F. Gremillion, attorney general; Shelby M. Jackson, superintendent of education; Lucille May Grace, register of land office; Sidney J. McCrory, commissioner of agriculture and immigration.

Education.—In the 1955-56 session the 816 public schools for whites enrolled 254,385 elementary and 101,330 high school pupils and employed 13,932 teachers; the 768 public schools for Negroes enrolled 174,159 elementary and 46,003 high school pupils and employed 6,950 teachers. The 210 private and parochial schools for whites enrolled 71,292 elementary and 14,811 high school pupils and employed 2,703 teachers; the 81 private and parochial schools for Negroes enrolled 20,055 elementary and 2,720 high school pupils and employed 547 teachers. The seven state-approved nursery schools and kindergartens enrolled 144 pupils and employed 14 teachers and assistants. The state operated 25 public trade schools in 1955-56. There were 7 state-supported colleges and universities for whites and 2 for Negroes, 11 privately endowed colleges and universities for whites and 3 for Negroes.

The total state budget for public education at all levels was about \$155,000,000 for the fiscal year 1955-56, compared with about \$177,000,000 budgeted for the fiscal year 1956-57.

Social Insurance and Assistance, Public Welfare and Related Programs.—Total benefit payments under the Louisiana unemployment compensation law were only \$11,756,330 for the fiscal year 1955-56, compared with \$18,626,016 for the fiscal year 1954-55. Louisiana expended more than \$116,000,000, in grants and operating costs, on public welfare in the fiscal year 1955-56, compared with \$108,000,000 in the fiscal year 1954-55.

In 1956 the state maintained eight charity hospitals; three hospitals for mental patients; three tuberculosis sanitariums; a school for white blind, a school for white deaf and a school for Negro blind and deaf; a training school for spastic children; and a training school for the feeble-minded.

Table 1.—Louisiana Public Welfare Programs, 1955-56

Type of assistance	Average number on rolls	Cost for the fiscal year
Old-age pensions	120,685	\$76,714,879
Needy blind	2,579	1,241,741
Dependent children	77,055	15,910,772
Disability assistance	15,559	7,122,445
General assistance	8,570	3,824,449
Foster children	2,537	1,726,510
Totals	226,985	\$106,540,796
Administrative expenses		9,814,136
Total cost of program		\$116,354,932

Source: Louisiana Department of Public Welfare Reports.

The state maintained a prison farm for about 3,000 adult offenders, separate training schools for about 240 delinquent white boys and girls, and a training institute for about 225 delinquent Negro boys. A new reformatory for first offenders, to separate them from the more hardened criminals, was completed in 1956.

Total state expenditures for maintenance, expansion and improvement of charitable and correctional institutions were about \$36,000,000 for the fiscal year 1955-56, compared with \$40,000,000 for the fiscal year 1954-55.

Communications.—Louisiana had 47,472 mi. of rural highways and urban streets in 1956, of which 15,100 mi. were state-maintained, 5,000 mi. being paved with concrete or blacktop and the remainder gravelled. Total state expenditures for public highways, exclusive of federal grants-in-aid, were about \$75,000,000 for the fiscal year 1955-56, compared with \$70,000,000 for the fiscal year 1954-55. There were about 4,400 mi. of railways and 4,800 mi. of navigable waterways. More than 100 airports and 10 seaplane bases were in operation in 1956. There were 751,919 telephones in service on Sept. 1, 1956. Total tonnage handled by Louisiana's three ports for ocean-going vessels increased from 69,417,303 in 1954 to 78,968,879 in 1955; that on the Gulf Intracoastal waterway from 36,928,214 in 1954 to 41,378,856 in 1955.

Banking and Finance.—On Jan. 1, 1956, Louisiana had 41 national banks, with total deposits of \$1,763,903,000 and resources of \$1,902,130,000; and 134 state banks, with total deposits of \$813,932,974 and resources of \$871,703,216. There were 62 savings and loan associations, with total assets of \$398,818,748; 314 small loan companies, with total assets of \$42,474,315; and 105 credit unions, with total assets of \$8,523,243. Total state income for the fiscal year 1955-56 was more than \$500,000,000, exclusive of federal grants-in-aid, compared with \$467,709,249 for the fiscal year 1954-55. State bonded debt on July 1, 1956, was about \$230,000,000.

Agriculture.—The total value of agricultural and truck crops was estimated at \$265,000,000 in 1956, compared with \$270,000,000 in 1955; total acreage harvested was 2,725,000, compared with 2,800,000 in 1955. Total income from crops, livestock and poultry and their products was estimated at \$390,000,000 in 1956, compared with \$400,000,000 in 1955; from government payments \$11,000,000, compared with \$12,000,000 in 1955.

Table II.—Principal Crops of Louisiana

Crop	Indicated 1956	1955	Average, 1945-54
Cotton (bales)	590,000	582,000	589,000
Cottonseed (tons)	246,000	233,000	238,700
Corn (bu.)	15,325,000	531,000	14,348,000
Rice (100-lb. bags)	11,344,000	13,150,000	11,639,000
Sugar cane (short tons)	5,194,000	6,054,000	5,480,000
Sweet potatoes (cwt.)	3,975,000	5,858,000	4,836,000
Irish potatoes (cwt.)	374,000	288,000	497,000
Hay (tons)	478,000	598,000	415,000
Oats (bu.)	3,680,000	4,092,000	2,192,000
Pecans (lb.)	12,000,000	25,000,000	13,335,000
Peaches (bu.)	100,000	*	115,000
Pears (bu.)	35,000	15,000	114,000
Oranges (boxes)	115,000	195,000	238,000

*Less than 500 bu.
Source: U.S. Department of Agriculture.

Table III.—Principal Industries of Louisiana

Product	All employees, 1954	Salaries and wages, 1954 (in 000s)	Value added by manufacture, 1954 (in 000s)	Value added by manufacture, 1953 (in 000s)
Food and kindred products	31,210	\$94,377	\$211,453	\$193,112
Textile mill products	2,389	6,444	12,350	8,713
Lumber and products (except furniture)	19,500	43,425	68,307	84,627
Paper and allied products	17,099	70,213	163,346	165,020
Chemicals and allied products	17,535	83,893	251,351	270,210
Petroleum and coal products	14,044	76,838	187,498	200,161
Stone, clay and glass products	4,828	18,133	40,873	35,954
Fabricated metal products	4,998	20,228	35,819	26,253
Machinery (except electrical)	2,743	10,837	15,754	18,144
Transportation equipment	9,338	38,975	50,864	44,670

Source: U.S. Department of Commerce, 1954 Census of Manufactures, preliminary report

Manufacturing.—More than 3,000 industrial establishments, employing 175,000 workers and paying about \$560,000,000 in wages and salaries, produced finished products worth \$1,760,000,000 in 1956, compared with \$1,750,000,000 in 1955. Under the state law exempting new industrial installations from taxation for ten years, capital investments in new industrial plants and expansions of existing ones amounted to more than \$100,000,000 in 1956, compared with \$150,000,000 in 1955; these provided 3,000 new jobs in 1956, compared with 4,500 in 1954.

Forest Products, Furs, Fisheries.—Louisiana forests produced 810,628,653 bd.ft. of lumber and 1,552,694 cords of pulpwood in the fiscal year 1954-55, compared with 818,678,014 bd.ft. and 1,486,871 cords in the fiscal year 1953-54.

The Louisiana fur harvest for the 1954-55 season was valued at \$3,418,730, compared with \$1,835,983 for the 1953-54 season, nearly \$1,000,000 of the increase being from nutria, a fur-bearing animal introduced into the state a decade earlier. The Louisiana fur industry was valued at \$15,553,185 for the 1945-46 season, and employed 20,000 persons.

The total catch of Louisiana commercial fisheries—fish, oysters, shrimp, crabs, frogs and menhaden—was valued at more than \$61,000,000 in 1955, compared with \$41,000,000 in 1953. Shrimp headed the list, with a value of \$28,000,000 in 1955. The finished product had a retail value of \$266,000,000 in 1955, and the industry, directly or indirectly, furnished a livelihood for more than 300,000 persons.

Mineral Production.—Table IV shows the tonnage and value of those mineral commodities produced in Louisiana in 1953 and 1954 whose value exceeded \$100,000. In 1954 the state was second among the states in production of natural gas and sulphur and third in the output of crude petro-

Table IV.—Mineral Production of Louisiana
(Short tons, except as noted)

Mineral	Quantity 1953	Value 1953	Quantity 1954*	Value 1954*
Total		\$965,237,000		\$997,107,000
Clays	624,000	952,000	†	†
Natural gas (000 cu.ft.)	1,293,644,000	106,079,000	1,399,222,000	124,531,000
Natural gasoline (000 gal.)	665,532	55,421,000	665,000	54,330,000
Petroleum (bbl.)	256,632,000	721,150,000	246,558,000	722,370,000
Petroleum gases (000 gal.)	287,280	12,654,000	292,000	11,620,000
Salt	3,061,000	9,190,000	3,089,000	11,101,000
Sand and gravel	4,538,000	5,162,000	7,910,000	9,687,000
Sulphur	1,802,000	43,453,000	2,076,000	49,222,000
Other minerals . . . . .	...	11,176,000	...	14,497,000

*Preliminary.
†Total has been adjusted to eliminate duplication in the value of clays and stone.
Source: U.S. Bureau of Mines.

leum and of salt; and ranked third in the value of its minerals, with 7.14% of the U.S. total.

ENCYCLOPEDIA BRITANNICA FILMS.—*Southeastern States*, 2nd ed. (1956).

Low, Solon Earl (1900—), Canadian political leader was born Jan. 8 at Cardston, Alta. He was educated at Calgary Normal college and at the universities of Alberta and Southern California. He entered provincial politics in Alberta as a Social Credit party candidate in 1935 and was a member of the provincial legislature until 1945; provincial treasurer for Alberta, 1937-44; minister of education, 1943-44 and minister without portfolio, Alberta government, Oct. 1944 to May 1945. Elected president and national leader of the Social Credit Association of Canada at the national conventions in Toronto, 1944, and Regina, 1946, he resigned his provincial seat in 1945 and on June 11 of that year was elected to the house of commons for Peace River, Alta. In June 1955 he conducted a campaign in Alberta on behalf of the Social Credit party, which was returned to power.

After extensive tours of Ontario, the east coast, British Columbia and Alberta, Low suffered a coronary attack on his arrival in Calgary at the end of Nov. 1955 to attend the annual Alberta Social Credit League convention. Following a considerable period of convalescence, he returned to work, on a limited basis in the early spring of 1956. From the beginning of June his recovery was excellent, and he therefore indicated in September that he would continue to lead the Social Credit movement and that there was no call for a national convention in 1956.

(M. L. S.)

Lumber. A preliminary estimate by the National Lumber Manufacturers association placed the total production of lumber in the United States in 1955 at 39,107,000,000 bd.ft. The total included 31,601,000,000 bd.ft. of softwood (coniferous) lumber and 7,506,000,000 bd.ft. of hardwood lumber (broad-leaved species). Production for 1954 and for selected earlier years, as reported by the bureau of the census, U.S. department of commerce, is given in Table I.

Table I.—Lumber Production in the U.S., Selected Years
(in 000,000 bd.ft.)

Year	Softwoods	Hardwoods	Total
1910	34,000	10,500	44,500
1920	26,810	6,989	33,799
1930	21,323	4,729	26,052
1940	24,903	4,031	28,934
1950	30,633	7,374	38,007
1951	29,493	7,711	37,204
1952	30,234	7,228	37,462
1953	29,562	7,180	36,742
1954	29,294	7,417	36,711

Production figures by species, according to reports of the bureau of the census, are shown for 1953 (latest year available in Tables II and III).

Of the principal softwood lumber producing regions of the United States, the Douglas fir region of the Pacific northwest led in 1955 production with 9,474,000,000 bd.ft. The southern pine region ranked second with 8,696,000,000 bd.ft., the west-

Table II.—Softwood Lumber Production in the U.S. by Species*

(in 000,000 bd. ft.)		1953
Kind of wood	production	
Douglas fir	10,367	
Northern yellow pines	7,581	
Loblolly pine	3,783	
White fir	1,577	
Shou-sug-sugi	1,441	
White pine (including western [Idaho] and eastern white pines)	1,334	
Redwood	969	

Lumber in smaller quantities also was produced from sugar pine, Englemann and other pines, cedars, larch, cypress and other softwoods.

Table III.—Hardwood Lumber Production in the U.S. by Species*

(in 000,000 bd. ft.)		1953
Kind of wood	production	1953
Oak	3,339	331
Black and tulip gum	709	236
Beech	551	210
Elm	530	132
Birch	406	

Other hardwood species included ash, sycamore, alder, basswood, hickory and walnut.

in pine region third with 8,658,000,000 bd.ft. and the California redwood region fourth with 2,527,000,000 bd.ft. The northern hardwood region, with 3,984,000,000 bd.ft., accounted for more than half the total 1955 hardwood lumber output.

Exports of lumber from the United States in 1955 amounted to 4,420,000 bd.ft., according to department of commerce reports, an increase over 1954 exports of 723,300,000 bd.ft. The 1955 total included 621,000,000 bd.ft. of softwood lumber, 139,000,000 bd.ft. of hardwood lumber, 3,300,000 bd.ft. of box boards and 80,300,000 bd.ft. of sawed railroad ties.

Imports of lumber in 1955 amounted to 3,596,800,000 bd.ft., compared with 3,066,200,000 bd.ft. in 1954. The 1955 total included 3,326,400,000 bd.ft. of softwood lumber, 266,400,000 bd.ft. of hardwood lumber and 4,000,000 bd.ft. of sawed railroad ties.

The wholesale lumber price index in 1955 rose to a new peak, passing the previous high point reached in 1951. Table IV shows average wholesale price indexes for lumber for selected years, from statistics published by the bureau of labour statistics, U.S. department of labour.

Table IV.—Wholesale Lumber Price Index in the U.S.

(1947-49 = 100)		Index
Year	Index	
1947	33.2	114.5
1948	23.1	123.6
1949	28.9	120.5
1950	40.7	119.4
1951	59.3	117.3
1952	107.3	124.4

Softwood plywood manufacture in the United States consumed a total of 1,861,435,000 ft., log scale, of logs in 1953. The hardwood veneer and plywood industry used 953,504,000 ft., log scale, of logs. Softwood plywood production for the year was 1,848,062,000 sq.ft. ($\frac{3}{8}$ in. equivalent), and hardwood veneer production amounted to 10,105,508,000 sq.ft., surface measure. Hardwood plywood production was 1,304,769,000 sq.ft., surface measure. The softwood plywood figures, as compiled by the department of commerce, represented the west coast softwood plywood industry, principally Douglas fir but including some hardwood. Hardwood veneer and plywood figures covered the veneer and plywood industry other than west coast companies and included some softwood.

An estimate of world production of sawed wood for 1954 by the forestry division of the United Nations Food and Agriculture organization placed the total at 268,900,000 cu.m., a slight increase over the revised 1953 estimate of 265,420,000 cu.m. (1 cu.m. = 424 bd.ft.). Approximately four-fifths of the total 1954 production was softwood.

In a regional breakdown of the estimated total world production in 1954, North America (the U.S. and Canada) accounted for 106,400,000 cu.m., the Soviet Union for 68,900,000 cu.m.,

Europe for 52,240,000 cu.m., Asia for 24,680,000 cu.m., Latin America for 9,500,000 cu.m., the Pacific area for 4,570,000 cu.m. and Africa for 2,640,000 cu.m.

The United States ranked first in production of both softwood and hardwood lumber. Its total output of approximately 88,000,000 cu.m. was about one-third of the world production of sawed wood. The U.S.S.R.'s 68,900,000 cu.m. ranked second. Canada reported 18,363,000 cu.m., Japan 14,090,000 cu.m., Sweden 7,553,000 cu.m., western Germany 7,103,000 cu.m., France 4,890,000 cu.m., Finland 4,801,000 cu.m., Brazil 4,386,000 cu.m., Austria, 3,881,000 cu.m. and Australia 3,099,000 cu.m. Other countries producing more than 1,000,000 cu.m. in 1954 were Yugoslavia, Italy, Norway, New Zealand, the United Kingdom and Switzerland.

The Forest Products laboratory, maintained by the U.S. forest service at Madison, Wis., developed and made available to industry a fast kiln drying schedule for oak panelling. A simplified kiln schedule for seasoning soft maple also was developed.

Information on the use of wood and wood products, developed through studies by the Forest Products laboratory, was made available in a *Wood Handbook* (U.S. department of agriculture handbook no. 72). The handbook contains data on properties, uses, protection, fabrication, processing and modification of wood, as an aid to use of timber products as materials for construction.

(See also FORESTS.)

(C. E. R.)

ENCYCLOPEDIA BRITANNICA FILMS.—*Lumber for Houses* (1952).

Lutherans. In 1956, merger talks and exploration of union were prominent among the 16 church bodies representing the 7,373,000 Lutherans in the United States and Canada.

Definite commitments for merger in 1960 were made by three church bodies—the 1,000,000-member Evangelical Lutheran Church, the 900,000-member American Lutheran Church and the 60,000-member United Evangelical Lutheran Church. Minneapolis, Minn., was selected as headquarters location for the merged body, to be known as "The American Lutheran Church." However, the 72,000-member Lutheran Free Church, initially a partner in the merger talks, withdrew because a referendum among local congregations failed to obtain the necessary three-fourths majority for union.

The invitation to all Lutherans to talks "looking toward organic unity" issued by the largest U.S. Lutheran body, the 2,270,000-member United Lutheran Church in America, and the 537,000-member Augustana Lutheran Church, was accepted by the 22,000-member American Evangelical Lutheran Church. The 60,000-member Finnish Evangelical Lutheran Church (Suomi Synod) voted to explore this proposal, as well as possibilities to join the group merging into the American Lutheran Church.

On the other hand, the 2,000,000-member Missouri Synod, second largest U.S. Lutheran body, declined the United Lutheran-Augustana invitation, as well as proposed membership in the Lutheran World federation, and so did the other church bodies co-operating in the Synodical conference—the Wisconsin Synod, the Norwegian Synod and the Slovak Evangelical Lutheran Church. Four other minor church bodies did not respond.

Meanwhile, the eight bodies belonging to the Lutheran World federation were active throughout the year preparing for their third assembly, to be held Aug. 15-27, 1957, at Minneapolis, Minn., the first world conclave of Lutherans on American soil. About 8,000 persons were expected to attend sessions for discussion of theology and practical questions under the theme "Christ Frees and Unites." Invited were 900 delegates and official visitors from 57 member churches in 29 countries.

In August, the National Lutheran council, co-operative agency for eight church bodies, announced that U.S. Lutheran giving

for spiritual and material relief activities abroad and in America had passed \$100,000,000. Receipts for Lutheran World Action, the council's annual fund appeal since 1940, totalled \$44,500,000. The value of relief materials shipped abroad by Lutheran World Relief, the council's material aid arm since 1946, exceeded \$56,000,000.

Included in the total food, clothing and medical shipments were \$22,000,000 worth of U.S. government-donated surplus foods. The rest was donated by church bodies of the National Lutheran council and the Missouri Synod, which had co-operated in the relief activities since 1953. The \$44,500,000 Lutheran World Action funds were used for projects in 75 countries including the United States. The largest amounts were spent on interchurch aid, support of orphaned missions and services to refugees.

The 7,150,704 Lutherans in the United States and the 222,234 in Canada were organized in 17,398 congregations served by 16,493 ordained ministers, according to 1956 statistics. During 1955 the number of ministers had increased by 612, a record high. Lutheran church property reached the unprecedented value of \$1,357,942,000. (See also CHRISTIAN UNITY; CHURCH MEMBERSHIP.) (A. LA.)

Luxembourg. An independent grand duchy in western Europe, Luxembourg is bounded south by France, northwest by Belgium and northeast by Germany. Area: 999 sq.mi. Pop.: (1947 census) 290,992; (1955 est.) 309,000. Languages: Letzeburgesch, a German dialect, and French (official). Religion: Roman Catholic, 98%. Capital: Luxembourg; pop. (1953 est.) 66,382.

Sovereign, Grand Duchess Charlotte. Prime minister in 1956, Joseph Bech.

History.—On July 13, 1956, the chamber of deputies adopted a constitutional amendment bill providing for a reduction of the term of office of deputies from six to five years and for the holding of general elections for the whole chamber every five years (instead of the previous system under which one-half of its membership had been renewed every three years). The chamber also decided to extend its lifetime by another two years, thus postponing the next general election from May 1957 to May 1959.

The country's economic position continued to be satisfactory, Luxembourg having the highest national income per head (46,450 fr. in 1955) on the European continent. The output of iron ore continued to increase, reaching 719,000 metric tons in May, while steel production was 304,000 tons in June—both being record figures.

In June a delegation of eight members of the supreme soviet headed by Justas Paleckis, chairman of the presidium of the supreme soviet of Lithuania, visited Luxembourg.

(See also EUROPEAN UNITY.)

Education.—Schools (1953–54): primary 1,045, pupils 28,597, teachers 1,063; secondary 7, pupils 3,253, teachers 280; vocational 7, pupils 3,313, teachers 170. Institutions of higher education 2, students 68.

Finance.—Monetary unit: Luxembourg franc, at par with the Belgian franc. Budget (1954 est.; 1955 est. in parentheses): revenue 3,867,000,000 fr. (4,039,000,000 fr.); expenditure 4,379,000,000 fr. (4,790,000,000 fr.).

Transport and Communications.—Roads (1955) 4,300 km. Railways (1955) 475.8 km. Licensed motor vehicles (Dec. 1955): passenger (including taxis) 21,230, commercial 6,307. Telephones (Jan. 1955) 29,861.

Agriculture.—Main crops (metric tons, 1954): wheat 34,000 (41,000 in 1953); rye 11,000 (8,000 in 1955). Livestock (Sept. 1955): cattle 130,000; sheep 3,000; poultry (1954) 443,000; horses (1954) 11,544; pigs (1954) 86,161.

Industry.—Fuel and power (1955): electricity 1,104,410,000 kw.hr.; manufactured gas 20,940,000 cu.m. Production (metric tons, 1955): iron ore (30% metal content) 7,205,000; pig iron 3,085,000; crude steel 3,225,000.

Macao: see PORTUGUESE OVERSEAS TERRITORIES.

Macedonia: see YUGOSLAVIA.

Machinery, Farm: see AGRICULTURE.

Machinery and Machine Tools. Makers of metal-cutting and of metal-forming machine tools in the United States attained a new peak of peacetime prosperity in 1956. For the second successive year, net new orders for metal-cutting machines ran ahead of shipments. They fell only a little below \$1,000,000,000. Shipments totalled almost \$900,000,000, compared with \$675,000,000 the previous year. The prosperity enjoyed by the U.S. machine-tool industry was world-wide in its sweep, taking in the machine-tool industries of Great Britain, western Europe and the U.S.S.R. as well.

Even more significant than the huge demand for machine tools was the technical progress made during the year. Higher labour costs and higher prices for materials and components spurred metalworking manufacturers to automate their production processes wherever they could. Ford Motor company, champion of automation, emerged during 1956 as the advocate of so-called "building-block" machine tools as a factor in extending the automatic production line into new areas of industrial production. The building-block idea calls for sectionalized units with standardized dimensions insofar as they affect rearrangement of the sections. If certain physical dimensions like spindle heights and mountings on machine tools are standardized, for instance, Ford pointed out that true interchangeability of units (base sections, wing sections, columns, heads, power units) can be realized, regardless of the make of the machine.

Such unitized machine tools built up of standard components would be easy to set up. Each station would be a machine in itself, complete with its own electrical and hydraulic circuits. Hence any given station could be cycled for set-up purposes. A number of stations could be set up simultaneously on an in-line machine, thus reducing the time to get into full production. If an operation is to be added on a part, after the line is tooled up, the in-line machine could be pulled apart, the proper machine units inserted and production resumed. Early in 1956, Ford ordered an in-line machine using the building-block concept, for manufacture of manifolds. The Ford idea met with a mixed reception among machine-tool builders, who stressed that its success on a wide scale would depend upon standardization of machine components in the industry far beyond prevalent usage.

Automation in assembly operations had lagged far behind machining operations up to 1956, when a number of companies began to build automatic assembly machines. These machines, perhaps more than any other kind of equipment, must be rigid, relatively maintenance-free and capable of long, continuous operation. They are of several types: dial indexing; indexing rectilinear; in-line transfer; or single-station. Assembly heads or mechanisms are mounted on the basic machine and interlocked mechanically or electrically to form a composite whole that operates automatically in a predetermined sequence. Operations must be held at least as close in tolerance as those used in producing the part. The assembly machines accept and assemble machined parts correctly sized. Inspection and selection make up the backbone of an assembly machine. In-process gauging (automatic sorting and rejection) eliminates scrap problems that might otherwise take all the advantages out of automatic assembly. The saving in labour costs in automatic assembly compared with manual assembly was shown to be tremendous.

Machine-tool builders, when confronted by the problem of developing a machine to handle a production operation, found that they had to design a production system rather than a machine tool. Feedback, for one thing, became an increasingly common concept. Experience with automatic machines brought out these points: (1) Three-fourths of metalworking jobs are concerned with lots of fewer than 25 pieces, so any machines designed for broad application must have great flexibility and be



GIANT FORGING PRESS said to be the largest machine in the world, stands 6 stories high (6 underground) and is capable of precision forming of intricate metal parts under 50,000-tons pressure. The entire operation of the press is under the control of one man, and of its total weight of 10,750 tons, 7,500 tons are moving parts. Developed for the U.S. air force, it went into full operation on aeroplane components at North Grafton, Mass., in 1956

st and easy to change over; (2) "float" is essential between units in a line, that is, storage of enough work between machines to allow one unit to be shut down for a tooling change without stopping an entire line; (3) easy maintenance is paramount, with convenience and accessibility stressed; and (4) too many units could not be tied together in a line, because coupled units may have to be idled unexpectedly for repairs. The trend was toward a maximum of three units linked together, with "float" between. Ceramic tools began to emerge during 1956 into the production stage from the purely experimental period. They are brittle, possess high abrasion and erosion resistance, have high hardness and high-temperature strength (but inferior low-temperature strength). They do not absorb heat as metals do, the tip remaining cool to the touch after a heavy cut. They are nonabsorbent, acid-resistant and unaffected by corrosion. They can be operated, however, with feed-and-speed combinations well beyond the capacities of most machine tools, and have the great merit of being relatively inexpensive. On two automotive finishing operations, parts per tool grind were doubled by use of ceramic tools, and the finish was improved. Large work is cut more easily with ceramics than other materials. In one case, a number of ceramic tool bits averaged 20,000 ft. of chip on a $3\frac{1}{2}$ -in. diameter workpiece, two bits got up to 70,000 ft., and the speeds were much higher than with carbide tools.

Ultrasonic equipment for cutting hard metals came into its own during 1956. Units were developed for inspection, testing, welding, brazing, soldering, machining and cleaning. Cutting action of an ultrasonic machine depends upon vibration in the elastic range or higher and is independent of hardness or brittleness of the material or its electrical conductivity. Cutting, drilling, tapping and other operations can be performed to close tolerances with no burning, checking or discoloration.

Electronic erosion as a metal-cutting process also made progress during the year. No cutting material is necessary with elec-

tronic erosion. Instead a powerful cutting force is used, being directed to the point of release by a conductor shaped to the desired contour of cut and resembling a cutting tool. The conductor is usually a soft, easily-worked material like brass. Electronic erosion, popularly called "spark machining," cuts the hardest electrically conductive materials without heat, alteration of physical properties, chemical changes or decomposition in the area surrounding the cut. It permits precise machining of the most intricate shapes. It is particularly desirable as a means for cutting the harder and tougher metal alloys.

For the first time, the U.S.S.R. revealed during 1956 that its output of machine tools had reached proportions that threatened the leadership of the United States. Soviet production in 1956 was estimated at 250,000 tons, or substantially greater than the British production and considerably more than that of West Germany. No exact comparisons could be made between machine tool production in the Soviet Union and in the United States because of the use of tonnage figures by the former and dollar figures by the latter. Nevertheless, the industry in the U.S.S.R., in physical capacity, was believed to be very close to that of the United States. (B. Fy.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Machine Maker*, 2nd ed. (1953).

Madagascar. An island (fourth largest in the world) off the southeast coast of Africa, Madagascar is an overseas territory of the French union. Comoro archipelago is administered as a separate territory. Areas and populations are:

	Area (sq.mi.)	Population 1951 census	1955 est.
Madagascar (with dependencies)	230,165	4,369,500	4,740,000
Comoro archipelago	832	164,838*	170,000

*1950 estimate.

Population: many indigenous racial and tribal groups, the Merina being the most numerous (about 900,000); 57,071 Europeans (1953) including 52,727 French; 17,376 Asians. Language: Malagasy, related to the Malayo-Polynesian group. Religion: Madagascar, Christian and pagan; Comoro archipelago, Moslem. Chief towns (pop., 1951 census): Antananarivo or Tananarive (cap.) 182,982; Tamatave 36,133; Majunga 38,042. High commissioner in 1956, André Soucoudaux. Comoros: administrator, Pierre Coudert.

History.—Elections to the French national assembly were held on Jan. 2. Roger Duveau (a former secretary of state), Rakotovelo and Tsirana, representing the U.D.S.R. (Union Démocratique et Socialiste de la Résistance), the M.R.P. (Mouvement Républicain Populaire) and the Socialist party respectively, were elected by the Malagasy college, two supporters of the Entente Franco-Malgache by the European. In the Comoro Islands Said Mohammed (U.D.S.R.) was re-elected.

A law of March 27 offered an amnesty to all persons sentenced to terms of imprisonment of 15 years or less in connection with the rebellion of 1947 and conditional liberty to all persons serving heavier sentences.

The Mandraka and Tsiazopaniry hydroelectric dams, near Tananarive, were inaugurated.

Several cyclones hit Madagascar: one, in January, destroyed the meteorological station on Tromelin Island; another, in February, did grave damage in the Tamatave area; and others, in March and in April, devastated the north and the southeast, while a disastrous drought struck the southern extremities.

(Hu. De.)

Education.—(1954) *Madagascar*: primary schools 1,861, pupils 236,041; secondary (including teacher training) (1953) 146, pupils 11,385; vocational 135, pupils 6,194. Higher institutions 4, students 378.

Foreign Trade.—(1955) Monetary unit: franc C. F. A. (Colonies Françaises d'Afrique)=2 metropolitan French francs. U.S. \$1=350 metropolitan francs. *Madagascar*: imports 21,000,000,000 fr. C. F. A., including 15,000,000,000 fr. C. F. A. from France; exports 14,000,000,000 fr. C. F. A.

A., including 9,000,000,000 fr. C. F. A. to France, 2,000,000,000 fr. C. F. A. to the U.S. *Comoro Islands*: imports 500,000,000 fr. C. F. A.; exports 500,000,000 fr. C. F. A. Principal exports: *Madagascar*: coffee 6,000,000,000 fr. C. F. A., rice 1,000,000,000 fr. C. F. A.; *Comoro Islands*: vanilla 300,000,000 fr. C. F. A.

Madeira: see PORTUGAL.

Magazines and Periodicals: see ADVERTISING; NEWSPAPERS AND MAGAZINES.

Magnesium: see MINERAL AND METAL PRODUCTION AND PRICES.

Maine. The extreme northeastern state of the United States, Maine was admitted as the 23rd state in 1820, and is popularly known as the "Pine Tree State." Land area 31,040 sq.mi.; water area 2,175 sq.mi.; pop. (1950 census) 913,774. The largest cities and their 1950 populations are: Portland 77,634; Lewiston 40,974; Bangor 31,558; Auburn 23,134; South Portland 21,866; Augusta (cap.) 20,913; Biddeford 20,836; Waterville 18,287.

The provisional estimate by the U.S. census bureau of the population of Maine as of July 1, 1956, was 910,000.

History.—Gov. Edmund S. Muskie was re-elected on Sept. 10, 1956, for a second two-year term, defeating Republican nominee Willis A. Trafton, Jr., by 180,254 to 124,395 votes. The only other Democrat to win two terms in the 20th century was Louis Brann (1933-36). Governor Muskie secured the largest vote ever given a governor in the state of Maine. Muskie favoured a more aggressive policy on such matters as industrial development, conservation and development of natural resources, schools and highways. The seats of Republican Senators Margaret Chase Smith and Frederick G. Payne were not at stake, but the Democrats wrested the second district house seat from the Republicans with state Democratic chairman Frank M. Coffin, first Democrat to win a seat in congress in 22 years. Coffin defeated James L. Reid, Republican nominee, 55,430 votes to 48,292. In the third district, largely rural and containing the Aroostock county potato area, the Republican incumbent, Clifford G. McIntire, won with 44,095 votes to 28,612 for his opponent, Kenneth B. Colbath. In the first congressional district, Robert Hale, Republican incumbent for the past 14 years, was credited with defeating James C. Oliver by only 29 votes.

Shortly after the September election the all-Republican executive council approved the promotion of three justices and appointment of three new justices to the highest courts of the state. Promoted from the superior court to supreme court were a Republican (Sullivan) and a Democrat (Dubord). Also promoted was Robert B. Williamson (Rep.), member of the supreme court who became chief justice. Of three new justices named to the superior court, two were Democrats. The Democratic party gained seats in both houses of the state legislature, but were still far from majority control in either house. In the presidential balloting on Nov. 6, Pres. Dwight D. Eisenhower won handily in Maine with more than 249,000 votes to about 102,000 for Adlai E. Stevenson.

The Public Administration service of Chicago, Ill., completed a study begun in 1955 which surveyed the state's executive agencies and recommended drastic overhauling, including paring down more than 60 agencies to 18 major departments. Governor Muskie appointed a citizen's committee to publicize the report and make known their findings to the 1957 legislature.

A state office building at Augusta was occupied in October, after two years of construction. Economic conditions were good in Maine in 1956 in spite of unfavourable weather for the vacation industry in June and July. The tourist trade was expected to top record 1955 by a narrow margin, unemployment in industry was low, and high potato prices in the early months of 1956 had boosted the economy of northern Maine. Major in-

dustrial construction was in the electric power and paper industries.

The chief officers of Maine during 1956 were: governor (only elected state official in Maine), Edmund S. Muskie; secretary of state, Harold I. Goss; attorney general, Frank F. Harding; treasurer, Frank S. Carpenter; auditor, Fred M. Berry; commissioner of agriculture, Fred J. Nutter.

Education.—The net enrolment in the public schools April 1, 1956, was 176,944 compared with 173,209 in 1955 and 168,225 in 1954. The state general fund appropriation for the department of education for the year 1955-56 was \$9,254,357 compared with \$8,694,076 for 1954-55. Expenditure per pupil based on average daily attendance in 1954-55 was \$156.99 for elementary schools; \$355.60 for secondary schools; in 1953-54 it was \$148.54 and \$333.18. Public school teaching positions in the state (elementary and secondary) were 6,950 in 1954-55 compared with 6,916 in 1953-54. The commissioner of education in 1956 was Warren G. Hill.

Social Insurance and Assistance, Public Welfare and Related Programs.—As of Dec. 31, 1956, there was a balance (Oct. 1 est.) of \$45,300,000 in the unemployment compensation benefit fund of the Maine employment security commission, compared with \$42,657,346, a year earlier. Total benefit payments for 1956 (Oct. 1 est.) were \$6,825,000, compared with \$8,145,650 for the previous year. The state expended for health, welfare and charities for the fiscal years ending June 30, 1956, and June 30, 1955, \$18,239,680 and \$18,061,226 respectively. Ten state institutions (correctional, mental, etc.) as of Sept. 30, 1956, had a total inmate population of 5,394 and 1,459 employees, and three tuberculosis sanatoria had 231 inmates and 264 employees. The total expended on the ten institutions for the fiscal years 1956 and 1955 was \$6,554,247 and \$5,993,229, respectively (figures do not include tuberculosis sanatoria, whose expenditures are included in health, welfare and charities since transfer to the department of health and welfare in 1955).

Communications.—Highways of the state in 1956 were: state highway system, 3,285 mi.; state aid system, 7,819 mi.; local system, 9,282 mi.; total, 20,386 mi. In the year ended June 30, 1956, the state expended state and federal funds for highway and bridge purposes, exclusive of debt and interest charges, \$32,199,946, compared with \$31,758,806 in 1955. Total expenditures of the highway department for the same years were \$37,285,947, and \$35,385,043. Steam railway mileage on 9 railroads was 2,013 line mi. in 1955. As of Oct. 1956 there were an estimated 244,659 telephone instruments in Maine, compared with 230,024 in Aug. 1955. Maine had 22 commercial airports and one commercial air line in 1956. There were 19 commercial radio stations and 6 commercial television stations in Maine as of Oct. 1956. There were 357,338 motor vehicles, including trailers, registered in Maine in 1955, and 381,580 (est.) for 1956, with 391,263 operators' licences issued in 1955 and 405,000 estimated for 1956.

Banking and Finance.—During 1956 the Maine banking department supervised 32 savings banks, with two branches; 27 trust companies, with 70 branches; and 29 loan and building, and savings and loan associations. The following figures are for June 30, 1956: deposits of savings banks, \$327,093,375; total assets, \$373,503,003; trust company deposits, \$295,703,824; total assets, \$326,049,524; building and loan and savings and loan associations, total resources, \$55,926,271. There were 31 national banks in the state with combined assets on June 30, 1956, of \$307,275,000, and total deposits of \$275,272,000. Receipts, expenditures and bonded debt of the state government for the year ending June 30, 1956, were respectively: \$95,922,020; \$91,685,260; \$35,720,000. For the year ending June 30, 1955, these were respectively: \$85,366,180; \$87,798,624; \$37,300,000.

Agriculture.—Indications in October were that the potato crop would be above average in quality and quantity.

Fisheries.—During 1955 there were 255,431,299 lb. of fish landed in Maine ports, valued at \$16,083,277 to the fishermen. Corresponding figures

Table I.—Principal Crops of Maine

Crop	Indicated 1956	1955	Average, 1945-54
Corn, bu.	363,000	432,000	463,000
Oats, bu.	3,149,000	2,370,000	3,164,000
Barley, bu.	33,000	24,000	108,000
Hay, tons	623,000	712,000	748,000
Potatoes, bu.	66,458,000	59,690,000	—
Apples, bu.	850,000	1,230,000	862,000
Beans (dry), 100-lb. bags	38,000	35,000	55,000

Source: U.S. Department of Agriculture.

Table II.—Principal Industries of Maine, 1955

Type of Industry	Value of Product	Gross Wages Paid	Employees
All manufacturing	\$1,224,692,622	\$339,437,677	105,871
Food and kindred products	166,729,171	24,461,163	9,305
Textile mill products	202,502,170	49,223,145	16,956
Apparel and other finished products made from fabrics and similar materials	21,285,452	4,959,728	2,214
Lumber and wood products (except furniture)	135,896,996	43,174,315	15,396
Furniture and fixtures	6,133,721	1,849,341	732
Paper and allied products	334,642,812	76,549,568	17,939
Printing, publishing, and allied industries	17,180,952	6,084,273	1,839
Chemicals and allied products	15,681,752	1,826,310	593
Petroleum and coal products	789,187	24,624	6
Rubber products	1,327,743	343,411	130
Leather and leather products	165,324,477	51,634,563	20,666
Stone, clay, and glass products	13,240,793	3,114,906	892
Primary metal industries	3,472,848	870,849	268
Fabricated metal products (except ordnance, machinery and transportation equipment)	28,848,646	7,251,060	1,977
Machinery (except electrical)	43,420,650	16,996,780	4,384
Electrical machinery, equipment, and supplies	7,420,208	1,755,594	568
Transportation equipment	55,084,017	47,618,409	11,346
Scientific instruments	840,476	319,186	96
Miscellaneous manufacturing	4,850,551	1,380,502	564

Source: Maine Department of Labor and Industry.

Table III.—Mineral Production of Maine

(In short tons, except as noted)

Mineral	Quantity	Value	Quantity	Value
	1953		1954*	
Total		\$10,503,000		\$10,716,000†
Cement (in bbl.)	2,001,000	5,422,000	1,973,000	5,425,000
Feldspar	20,000	117,000		
Sand and gravel	8,072,000	2,608,000	7,461,000	2,538,000
Stone	249,000	1,215,000	1,024,000	2,355,000
Other minerals	...	1,141,000	...	930,000

*Preliminary. †Total has been adjusted to eliminate duplication in the value of clays and stone. ‡Value included with other minerals.
Source: U.S. Bureau of Mines.

for 1954 were 283,905,900 lb. and \$16,855,600, respectively. This represented a decrease in quantity of 10%, and a decrease in value of 5% for 1955 compared with landings of 1954. The value of the principal species (1955) with weight in pounds in parentheses, included: lobster \$8,716,012 (22,718,091); rosefish or ocean perch \$2,577,442 (67,684,954); clams \$1,022,225 (2,871,393); herring \$1,352,969 (99,415,826).

Manufacturing.—The average weekly hours worked in manufacturing by production workers (Aug. 1956) was 42.2 and average hourly earnings were \$1.546 compared with 40.3 and \$1.446 for the same period in 1955. The nonagricultural labour force of the state employed in mid-Aug. 1956, was estimated at 290,300, a post-World War II high and 2% above Aug. 1955 when 284,500 persons had nonfarm jobs. Production of Maine industries in 1955 was valued at \$1,224,692,622, a record high in dollar volume. Paper, leather, food and lumber accounted for the gains, while there were losses in textiles and fabricated metal products. There were 105,871 industrial workers, of whom 30,606 were women. Comparable figures for 1954 were: \$1,138,778,168; 110,675; 34,762. Average annual earnings were: \$3,206 (1955); \$2,866 (1954). (E. F. D.)

Mineral Production.—Table III shows the tonnage and value of those mineral commodities produced in Maine in 1953 and 1954 whose value exceeded \$100,000. In 1954 Maine was third among the states in output of feldspar and fifth among those that sold or used mica. Maine also produced some columbium-tantalum. It ranked 44th in value of its mineral output, with 0.08% of the U.S. total.

ENCYCLOPEDIA BRITANNICA FILMS.—*Lobster town* (The Story of a Community) (1955); *Northeastern States*, 2nd ed. (1956).

Maize: see CORN.

Makarios III (MIHAIL CHRISTODOULON MOUSKOS) (1913–), archbishop and primate of the Orthodox Church of Cyprus, was born at Ano Panayia, near Paphos, Cyprus, Aug. 13. In 1942 he graduated with honours from the theological faculty of the University of Athens and was ordained priest in Nov. 1946. Shortly afterward, with a scholarship from the World Council of Churches, he studied sociology and theology at Boston university, Mass. Elected bishop of Nicosia, Cyprus, he was enthroned on June 13, 1948. At that time there was a Communist rebellion in Greece, and in Cyprus the Communist-controlled AKEL (*Anorthotikon Komma Ergatikon Laou*, or Progressive Party of Working People) was clamouring for *enosis* ("union") with Greece. Makarios decided to organize a national movement for *enosis* which would paralyze Communist influence and re-establish the church's prestige. He arrived in Greece in the autumn of 1949 and conveyed the blessings of the church and the greetings of the people of Cyprus to the national army fighting the Communist rebels. On his return he suggested the holding of a plebiscite on *enosis* which was held on Jan. 15, 1950, and produced a 95% vote for *enosis* among the Greek population. On Oct. 26, 1950, Makarios was unanimously elected by the people archbishop and *ethnarch* (national leader) of Cyprus.

When at the end of 1954 the British government stated that it was ready to grant "self-government" to Cyprus but would never recognize its right of "self-determination," a new body appeared in Cyprus in the form of EOKA (*Ethniki Organosis Kypriakou Agonos*, or National Organization of Cypriot Struggle). On Oct. 4, 1955, Makarios met Field Marshal Sir John Harding, the new governor of Cyprus, and proposed that the British government recognize in principle the right of the Cypriot people to self-determination but that the time for its application be left for further discussion. On March 9, 1956, Makarios was arrested and deported to the Seychelles Islands. On Aug. 27 the British press published extracts which were described as "irrefutable proof" that Makarios was the leader of the terrorist campaign which had started in the spring of 1955.

Malaria: see TROPICAL DISEASES.

Malaya, Federation of. The Federation of Malaya consists of the British settlements of Malacca and Penang and the protected states of Johore, Kedah, Kelantan, Negri Sembilan, Pahang, Perak, Selangor, Trengganu and Perlis. Area 50,690 sq.mi. Pop.: (1947 census) 4,908,086, including 2,427,834 Malays (49.5%), 1,884,534 Chinese (38.4%), 530,638 Indians and Pakistanis (10.8%); (1955 est.) 6,152,000. Religion: Malays are Moslem; Indians mainly Hindu; Chinese Buddhist, Confucian and Taoist. Chief towns (pop., 1947 census): Kuala Lumpur (Selangor; federal cap.) 175,961; Penang or George Town 189,068; Ipoh (Perak) 80,894; Malacca 54,507; Taiping (Perak) 41,361; Johore Bahru 38,826; Seremban (Negri Sembilan) 35,274.

High commissioner in 1956, Sir Donald MacGillivray; chief minister, Tengku Abdul Rahman.

History.—The final chapter of more than 100 years of British rule in Malaya was opened on Feb. 8, 1956. On that day in London the act of signing the report of the conference on the constitutional development of the Federation of Malaya brought self-government into effect and with it the strong possibility of full independence for the federation within the Commonwealth by Aug. 31, 1957.

The triumphant return from the London talks of the chief minister, Tengku Abdul Rahman, and his mission colleagues gave added spur to the federation's march toward independence and thereafter the bulk of the federation's effort was geared to the problems of building a prosperous, democratic and united nation. The problems were many. Labour troubles, particularly in the country's two major industries, rubber and tin mining, struck an unhappy note earlier in the year. The chief minister made it clear that although trade unions were recognized as an essential cog in the economic machinery, he was not going to let the opportunity to win independence be marred by unreasonable demands from the workers. Firmly, yet affably, Abdul Rahman dealt with the many difficulties that could be expected to arise in a country with a multiracial population, including, for instance, the vexing question of citizenship which threatened to split the political alliance (which he led) of the United Malays National organization, the Malayan Chinese association and the Malayan Indian congress. Abdul Rahman persuaded a strong opposition to accept one of the more contentious points of the

BRITISH JUNGLE PATROL reactivated in the eight-year guerrilla war on the Malay peninsula against red terrorists, in Feb. 1956, a few hours after a five-month amnesty failed to bring agreement with the Communist leaders



Alliance party's memorandum to the Reid constitutional commission—that the Malays, as the country's real sons, be accorded special rights in the new, independent nation of Malaya.

The Alliance party's memorandum was one of more than 130 presented to the commission. Lord Reid, who headed the commission, indicated on his departure from the federation in October that the constitution they would recommend for independent Malaya would provide for one ruler to be chosen from the nine Malay rulers. He would have a constitutional status in the Commonwealth similar to that of the president of India or Pakistan. According to the commission's terms of reference, the constitution would be federal in form with a bicameral legislature.

In February the amnesty offer to the remaining 2,600 Communist terrorists was withdrawn and the government renewed its efforts to end the fight against militant communism which had begun in 1948 and had cost the federation government alone more than M\$1,000,000,000.

Following the London conference in February the chief minister also became minister for internal defense and security and, as part of his plan to bring the peoples of the country into closer touch with the emergency, he increased the number of operational home guard units.

The news which the whole country had eagerly awaited came at the November meeting of the federal legislative council. In his budget speech the federation's high commissioner, Sir Donald MacGillivray, indicated that independence for Malaya had definitely become reality; independence day would be Aug. 31, 1957. At the same meeting the 1948 Federation of Malaya agreement was amended to allow for the Malayanization of the public service and to give every expatriate officer the option to retire with compensation for loss of career at any date from July 1, 1957.

In December, almost one year after leaving the federation for the constitutional talks, the chief minister returned to London as leader of a delegation seeking a loan to assist the country in its *merdeka* (independence) development schemes.

(See also SINGAPORE.)

(L. V. D.)

Education.—Schools (1954): Malay 2,086, pupils 349,556, teachers 13,218; Chinese 1,236, pupils 251,124, teachers 8,329; Indian 894, pupils 44,538, teachers 1,740; English 356, pupils 158,485, teachers 5,582; junior technical 5, pupils 768. Teachers' training colleges 5, students 1,487. Institutions of higher technical education 2, students 356, teaching staff 24. University of Malaya (Oct. 1954) students 1,043, teaching staff 161.

Finance.—Monetary unit: Malayan dollar (=about 2s. 4d. sterling) with an exchange rate of M\$3 to the U.S. dollar. Budget (1954, actual; 1956 est. in parentheses): revenue M\$12,522,239 (\$744,000,000); expenditure M\$809,306,335 (\$794,000,000).

Foreign Trade.—(Including Singapore, 1955): Imports M\$3,822,000,000; exports M\$4,156,000,000. Principal exports: rubber, tin, coconut oil, copra, palm oil.

Transport and Communications.—Roads (1953) 9,980 km. Registered motor vehicles (Oct. 1955): passenger 52,522, commercial 18,817. Railways (including Singapore, 1955) 1,700 km.; freight, ton-km. (1955) 394,800,000. Air transport (1954): 142,665 passengers arrived, or departed from federation airports.

Agriculture.—Main crops (metric tons, 1955; 1954 in parentheses): rubber (including Singapore) 649,400 (593,800); rice 658,000 (656,000); copra 146,000 (166,800); palm kernels (estates) 15,100 (14,700); palm oil (estates) 57,400 (54,800); tea (estates, 1954) 2,100; pineapples (1954) 66,000. Livestock (1954): sheep 27,200; pigs 398,700; goats 271,700; buffaloes 236,800; cattle (1955-56) 279,000. Sawn hardwood (1954) 1,863,000 cu.m. Fish landings (1953) 164,400 metric tons.

Industry.—Production (metric tons, 1955): tin concentrates (metal content) 62,280; cement 109,200; iron ore (60% metal content) 1,489,200; electricity 948,000 kw.hr.; (1954) coal 229,590; bauxite 169,500; gold 21,000 fine troy oz.

Malta. This British internally self-governing colony and strategic base consists of a group of three Mediterranean islands and three uninhabited islets, about 60 mi. S. of Sicily. Area of main islands: Malta 95 sq.mi.; Gozo 26 sq.mi.; Comino 1 sq.mi. Total pop.: (1948 census) 305,991; (1956 est.) 314,000. Language: Maltese (possibly of Punic [Phoenician] origin, with heavy Arabic and some Italian overlay) and English; Italian is also spoken. Religion: Roman Catholic. Principal towns (pop., 1953 est.) Valletta (cap.) 19,145, excluding suburbs; Sliema 24,839; Pawla with Tarxien 20,471; Hamrun 18,995; Birkirkara

17,774. Governor in 1956, Sir Robert Laycock. Prime minister, Dominic Mintoff.

History.—The round-table conference which began its sittings in 1955 submitted its report to the British government in December of that year. It emphasized that the Maltese came voluntarily under the British crown and were entitled to a special road to political equality, through representation at Westminster. The acceptance by the British government of three Maltese representatives in the house of commons was recommended, but it was for the Maltese people to determine clearly and unmistakably whether this corresponded to their own wishes.

In Feb. 1956 the Malta Labour government held a referendum on constitutional, economic and consultative proposals for integration, which included the principle of economic equivalence and representation at Westminster. The Nationalist party considered that the referendum was not being held in a free and democratic manner and told its supporters to boycott it; a protest was sent to the member countries of the United Nations organization except the Communist countries. The Catholic Church declared it could not accept integration until assurances were written into the Malta constitution guaranteeing its status. Out of 153,000 registered voters a little more than 60% went to the polls; 67,000 voted in favour of integration and 20,000 against.

On March 26, 1956, after a debate, the house of commons resolved to take note of the conference report which was accepted unconditionally by the government.

On the recommendation of an economic commission set up by the governments of Britain and Malta, the British government agreed to contribute up to £5,660,000 toward the total expenditure approved by the Malta parliament in the budget for 1956-57.

(A. G.)

Education.—(1955) Government schools: primary 112, pupils 52,236; secondary 7, pupils 2,372; vocational 3, pupils 337. Private schools 90, pupils 15,800. Royal University of Malta (Oct. 1954): students 411, teaching staff 52.

Finance and Trade.—Currency: sterling. Budget (1955-56 est.; 1954-55 actual in parentheses): revenue £8,968,000 (£8,202,216), expenditure £11,162,130 (£8,374,927). Foreign trade (1955): imports £20,500,000; exports £23,360,000.

Manchuria: see CHINA.

Mandated Pacific Islands: see TRUST TERRITORIES.

Mandates: see TRUST TERRITORIES.

Manganese. Concurrent with the upswing in steelmaking, world output of manganese increased in 1955. Data in this article, including the tables, were based on U.S. bureau of mines reports.

Table I.—World Production of Manganese Ore

	1949	1950	1951	1952	1953	1954	1955
(In thousands of short tons)							
Brazil	165.2	215.5	224.4	274.7	255.1	179.2	178.7
Chile	?	37.0	40.3	59.4	60.2	58.4	58.4?
Cuba	68.9	87.3	169.9	277.4	389.4	296.8	346.7
Belgian Congo	13.5	18.7	78.2	141.1	238.8	424.3	509.0
Fr. Morocco	257.8	316.7	410.3	469.9	473.3	441.4	453.4
Gold Coast	830.0	796.7	902.8	889.5	835.5	515.5	604.3
India	723.3	988.9	1,447.5	1,637.7	2,130.5	1,583.5	1,702.8
Portuguese India	17.9	33.1	95.7	122.4	166.2	116.8	154.5
Japan	110.2	153.2	203.9	228.6	214.3	180.2	209.6
Turkey	24.9	35.5	55.7	88.7	99.0	54.9	55.2
South Africa	722.2	871.9	836.5	964.1	912.3	772.9	649.2
U.S.S.R.	1,650 ?	2,200 ?	2,800 ?	2,800 ?	3,900 ?	4,400 ?	4,800.0?
United States	126.1	134.5	105.0	115.4	157.5	206.1	285.0?
Total	5,071	6,200	7,800	8,800	10,900	10,250	11,000?

United States.—More manganese is known to be consumed in the U.S. than in any other country. Domestic deposits of manganese, though many, contain low-grade ore and provide only a small part of requirements; a great deal of high-grade ore is therefore imported. The countries of origin of the chief-imports are shown in Table II.

In the first half of 1956, U.S. mine shipments of manganese were 153,600 tons; imports for consumption were 1,047,993 tons

Table II.—Data of Manganese Industry in the U.S.

	1949	1950	1951	1952	1953	1954	1955*
(in thousands of short tons)							
Shipments	126.1	134.5	105.0	115.4	157.5	206.1	288.7
Metallurgical ore	110.9	122.9	95.2	101.0	140.0	193.0†	...
Battery ore	15.0	11.5	9.8	14.4	17.5	17.0	...
Exports, general	1,544.5	1,834.9	1,767.6	2,669.0	3,501.0	2,166.1	2,088.4
Imports for consumption:	1,423.8	1,925.1	1,902.9	2,204.0	3,115.0	2,244.1	2,266.0
Brazil	201.6	136.3	97.6	174.2	155.4	100.1	138.2
Chile	14.7	7.8	23.8	21.8	32.4	18.5	35.6
Cuba	60.8	96.9	147.1	259.2	397.3	261.5	271.7
Gold Coast	281.8	378.1	360.3	282.0	333.6	193.6	301.2
India	357.2	642.5	616.9	772.5	1,218.2	952.6	824.4
Mexico	53.6	34.5	99.9	92.3	129.9	122.5	112.4
U. of S. Afr.	275.6	510.0	424.0	298.3	406.0	240.4	223.6
U.S.S.R.	151.0	65.6	2.6	...	...	...	...
Consumption	1,360.0	1,650.4	2,121.0	1,918.0	2,254.0	1,658.0	2,378.0

*Preliminary. †Estimate.
†Includes ore withdrawn from bonded warehouse, irrespective of period of importation and ore received in the U.S. during period shown for immediate consumption.

10,014,349 tons metallurgical grade and 18,490 tons battery and chemical grades); and exports of ore were estimated at 7,000 tons.

Brazil.—After four or five years' development work in a deposit of manganese of good grade (48%) in the territory of Mapá, mining was scheduled to begin in Oct. 1956. The plant was equipped to produce 1,000,000 metric tons a year if needed, possibly to start with 300,000 tons yearly. The project was financed by the Export-Import Bank of Washington.

(F. E. H.; B. B. M.)

Manitoba. A central province of Canada, Manitoba was established as a province on July 15, 1870. Area 246,122 sq.mi. (26,789 sq.mi. water). Pop. (1951 census) 776,541; approximately 60% were urban. Capital: Winnipeg, pop. (1956 census) 256,683. Other cities (1956): St. Boniface, 28,636; Brandon, 24,579; Portage la Prairie, 10,374; Flin Flon, 10,155; St. James, 26,240 (newly formed city 1956).

History.—During 1956, J. S. McDiarmid represented the crown as lieutenant governor for the province; D. L. Campbell was premier. There were 57 seats in the provincial legislature with the government (Liberal-Progressive) having 35 seats.

The Manitoba Liquor act was proclaimed law in July 1956. This act was the result of the royal commission appointed in 1955 to inquire into all phases of liquor legislation and its administration in the province. Their report was published in 1956. Bernard Halstead was chief commissioner of the government liquor commission.

The report of the redistribution of electoral seats was being delayed awaiting the outcome of the new census of 1956.

Education.—In the school year 1955-56 there were 2,352 school districts; 153,233 pupils were taught by 4,228 qualified teachers and 438 permit teachers. The University of Manitoba is situated at Ft. Garry and has six affiliated colleges. There is one normal school and one technical vocational high school.

Public Health and Welfare.—Under the Manitoba Health Services act there were 13 local health units in 1956 serving a total population of more than 320,000; five laboratory and X-ray units were operating with headquarters at Selkirk, Virden, Dauphin, Neepawa and Portage la Prairie. Hospitals for mental diseases at Brandon and Selkirk and Psychopathic hospital in Winnipeg had 3,783 patients under treatment during 1955-56. There were 13 general hospitals with more than 60 beds; 26 with fewer than 60 beds; 1 contagious diseases hospital; 2 for chronic diseases and sanatoriums.

Communications.—The estimated length of all-weather roads at April 1, 1956, was: gravelled 2,923 mi., bituminous 1,069 mi., concrete 107 mi. There are seven radio stations and two short-wave stations in Manitoba and one television station. As of Dec. 31, 1955, there were 211,162 subscriber stations in the government-owned telephone system.

Finance.—At March 31, 1955, surplus over expenditure was \$506,278.97 from a revenue of \$58,824,450. For 1956-57 the anticipated revenue was \$77,322,450 and anticipated expenditures were \$59,421,295.61.

Agriculture.—Production for 1955 included: field crops \$140,493,000 (initial payments only for wheat, oats, barley); livestock \$48,471,000; dairy \$28,215,000; garden products \$6,595,000; poultry products \$22,277,000; fur farming \$3,000,000; honey \$870,000. Shipments of grain through Churchill Port amounted to 13,077,845 bushels.

Fishing and Fur.—Production of fish for the year 1955-56 amounted to 1,936,600 lb. The value as marketed was \$6,146,761; value to fishermen, \$476,843. In 1955-56 the estimated value of raw furs exported was \$1,145,737.14.

Mineral Production.—The estimated value of mineral production in 1955 was \$62,591,496, of which \$41,268,121 represented metals; the total included about 4,145,756 bbl. of crude oil, valued at \$9,516,655. Manitoba

had 11 established oil fields with 486 producing wells.

Manufacturing.—There were 1,600 manufacturing firms, giving employment in 1955 to 50,000 persons. Payrolls for production workers alone reached a total of \$121,325,000. A total of 59 new industries were established in 1955. (M. Mv.)

ENCYCLOPEDIA BRITANNICA FILMS.—*Manitoba* (1955); *Prairie Provinces of Canada* (1943).

Maple Sugar: see SUGAR.

Maps: see CARTOGRAPHY.

Mariana Islands: see MARSHALL, CAROLINE AND MARIANA ISLANDS.

Marine Accidents: see DISASTERS.

Marine Biology. Effects of Atomic Radiation.—Marine biologists were becoming increasingly concerned in 1956 with the practical problems that present themselves as a consequence of atomic explosions, or the possible indiscriminate disposal of atomic wastes in the oceans. More and more they were becoming convinced that fundamental studies to provide a basis for formulating a sound policy toward such matters should be undertaken at once, because within about 20 years the expected contamination would make this work impossible. They believed that biologists probably did not need to be immediately concerned with the deep waters of the oceans, since materials that might accumulate there would not be returned to the shallower layers for a 100 years or more, and in the Black sea this period would perhaps be as much as 2,500 years. On the other hand, any waste or fission products entering the surface layers especially in shallow coastal waters would in time be transported by ocean currents to localities where, if sufficiently concentrated, they would affect resources of the sea of value to man. For example, a year after the Bikini tests, artificial activity, then reduced to one-fifth the natural activity in the oceans, could be detected 3,500 mi. away.

The immediate results of contamination were gradually becoming known, partly by noting the effects which followed an atomic explosion, partly from physiological experiments. Two fission products of uranium, caesium 137 and strontium 90, have a long half-life (33 and 28 years, respectively). The effects of the former are not likely to be as serious as those of strontium because it is not stored in any particular tissue and is rather quickly excreted (H. J. M. Bowen, 1956). On the other hand, strontium 90 is one of the most hazardous fission products. Non-radioactive strontium is widely distributed on the earth and enters into various biological processes, usually associated with calcium to which it is rather similar chemically (H. J. M. Bowen, 1956). It is quickly absorbed by the blood and soft tissues and then concentrated in skeletal structures, such as shells, spicules, bone, etc. (H. J. M. Bowen, 1956). Likewise, it is absorbed and retained by plants (T. R. Rice, 1956).

Following an atomic explosion, fishes in nearby water accumulate fission products in their viscera in high concentrations, with lesser amounts in bone, skin and muscle (K. Amano, *et al.*, 1956; M. Saiki, *et al.*, 1955). On the other hand, experiments were made on frozen fish to determine what would happen if a loaded fishing boat chanced to be in the vicinity of an atomic fall-out. The results indicated that caesium readily entered through the skin and within four days the muscles were as contaminated as the skin. However, only a small fraction of the radioactive strontium or ruthenium would have passed through the skin even after eight days following exposure (W. A. Chipman, 1956).

The radioactive elements were selectively concentrated in various tissues within fishes from contaminated lakes; *i.e.*, radio-strontium and radiophosphorus in the "hard tissues" and caesium and the rare earths in the "soft tissues" (L. A. Krumholz, 1956). The radio-strontium might be taken in in concentrations 20,000

to 30,000 times greater than in the lake water (L. A. Krumholz, 1956). Such an accumulation might amount to a microcurie within the body of a single fish (L. A. Krumholz, 1956). These fish not only grew more slowly, but also had a shorter life span (L. A. Krumholz, 1956). These observations were based on freshwater organisms; however, similar, but less extreme results might be expected in a marine environment.

Productivity.—The hit-or-miss search for fishes in the productive areas of the continental shelves had been fairly successful through the centuries, but similar methods on the high seas had not proved rewarding. The potential resources of approximately 90% of the oceans had not been tapped yet, chiefly because it was not known where to search. Working out of Hawaii, the U.S. fish and wildlife service studied areas where commercial fisheries, especially tuna, might be developed. The warm surface water is deficient in nutrient salts and hence in plankton, but the underlying colder water is relatively rich in nutrients. This nutrient-rich water reaches the photic zone as a result of upwelling in the Equatorial convergence-divergence system; the shearing in a current interface in the boundary between the North Equatorial current and the North Pacific drift; and eddies and wakes in the North Equatorial current flowing around the Hawaiian Islands (O. E. Sette, 1955). Plankton is more abundant in such areas and a good quantity of tuna were taken close by with the Japanese "long line." Therefore, it seemed likely that when more was known about the hydrographic structure of the oceans, other promising oceanic areas would be located (O. E. Sette, 1955).

Scattering Layers.—The scattering layer continued as one of the important biological problems and several novel approaches added materially to the knowledge of this phenomenon. A suspended echo sounder and camera were used to make simultaneous sound and photographic records. Despite the fact that the acoustic field for the echo sounder was larger than the optical field for the camera (H. R. Johnson, *et al.*, 1956), it was found that whenever a fish was photographed, the echo recorded at the same time was strong. Sometimes with weaker echoes, photographs of salps or other small invertebrates were obtained or the photographic plate was a blank. In the latter case, it might be assumed that the scatterer was within the acoustic field, but not within the optical field.

With a suspended echo sounder operating alone, individual scatterers were followed in their upward trek as evening approached, and the rate of ascent of about 15 ft. per minute was computed. The number of individual scatterers in various layers was counted and estimates were made that one individual occurred in a volume of perhaps 650 to 2,000 cu.m. of water (H. R. Johnson, *et al.*, 1956). At midday, when the scattering layer was deepest and densest, these volumes would perhaps be significantly reduced. However, counts could not be made when scattering was so intense (H. R. Johnson, *et al.*, 1956).

A new highly sensitive bathyphotometer (G. L. Clarke and G. K. Wertheim, 1956) measured the light intensity of the noon-time depths of the deep scattering layers, with an illumination as low as 0.01 $\mu\text{W}/\text{cm}^2$ isolume. As evening approached, these layers rose and split in two. The upper layers at 40 m. had a light intensity ten times that at the noon depth. Hence, the vertical migration did not appear to follow a particular light intensity (G. L. Clarke and R. H. Backus, 1956). A modification of the photometer afforded an opportunity to record the luminescence of organisms dwelling at different depths and localities. The intensity and frequency of these flashes were distinctive for the coastal and slope waters (G. L. Clarke and R. H. Backus, 1956).

(See also FISHERIES; NATIONAL GEOGRAPHIC SOCIETY; OCEANOGRAPHY.)

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ENCYCLOPÆDIA BRITANNICA FILMS.—*Crustaceans* (Lobsters, Barnacles, Shrimp, and Their Relatives) (1956); *Marine Life* (1953); *Mollusks* (Snails, Mussels, Octopuses, and Their Relatives) (1955); *Worms* (The Annelida) (1955).

Marine Corps, U.S. The United States marine corps, which celebrated its 181st birthday on Nov. 10, 1956, engaged throughout the year in a continuing program to adapt the working principles of amphibious warfare to the requirements of the nuclear age. Maintaining itself as a thoroughly trained and highly mobile combat-ready force, the corps staged manoeuvres in widely separated parts of the world to test new tactics, techniques and equipment.

The extent to which amphibious landings had become "triphibious"—involving air as well as land and sea—was further demonstrated in 1956 through increased use of the assault helicopter. In June a marine corps battalion landing team employed assault helicopters in staging the simulated vertical envelopment of a beachhead at Dikili, Turk.

Marines participated in other amphibious exercises in North Carolina, California, Alaska, Hawaii, the Caribbean area and the far east. In February a battalion landing team took part in Operation "Firmlink," a demonstration in Thailand by the United States armed services and the Philippine army for members of the Southeast Asia Treaty organization.

A tactical air operation involving more than 200 separate air lifts from one island to another was conducted by marines in Hawaii in late September and early October. Jets, propeller-driven aircraft and helicopters were used in transport, close air support, aerial cover, reconnaissance and artillery spotting.

Marines also participated in tests of the prototype of the helicopter assault carrier U.S.S. "Thetis Bay," which was converted by the navy from an escort carrier early in the year and commissioned July 20.

The marine corps in 1956 was under the command of Gen. Randolph McCall Pate, who became the 21st commandant on Jan. 1. On June 30, at the end of the fiscal year, the corps had a strength of 200,780 men and women on active duty. Included were three marine divisions and three marine aircraft wings as authorized by public law 416, 82nd congress.

Also available for active duty in the event of a national emergency was a marine corps ready reserve of approximately 200,000 men and women who were reclassified during the year. Organized reserve units of the corps numbered 291.

As the result of an accident in which six recruits lost their lives at Parris Island, S.C., the corps undertook a reappraisal of its recruit training program. For closer supervision, two recruit training commands were formed—one at Parris Island, the other at San Diego, Calif. Each was placed under a general officer re-

responsible directly to the commandant of the marine corps. The period of recruit training was lengthened, and rigorous marine training methods were continued in the interest of maintaining the traditionally high standards of the corps.

During the year, marines were on duty around the world. A marine division and a marine aircraft wing were stationed on each of the two coasts of the United States. Another division and another wing were in the far east. An air-ground task force was maintained at Kaneohe bay, Oahu, T.H. Other marines were at U.S. navy bases and with U.S. fleets; at U.S. embassies; at North Atlantic Treaty organization and United Nations installations; and at marine corps posts and stations throughout the United States. A battalion landing team sent to the 6th fleet in the Mediterranean in March was replaced by a similar team in the fall.

Maritime Administration, U.S.: see MERCHANT MARINE.

Marriage and Divorce. Marriage and divorce rates throughout the world remained relatively steady during 1956. With few exceptions, European birth rates continued to decline slightly, although the total number of births was at a high level. Because of the rapid increase in the world's population (expected by 1980 to be 50% greater than 1950), earnest attention was being given to ways and means of limiting population growth. The International Institute for Social-Ecclesiastical Research (Geneva, Switz.), an official Roman Catholic institution, offered a prize of \$5,000, to be awarded in 1957, for the best positive answer, complying with Catholic principles, to the question of how population growth could be influenced to provide a social structure that would satisfy the requirements of complete human well-being.

United States.—Although the unadjusted marriage rate for the first half of 1956 was only per 1,000 of population, a total of 1,580,000 marriages was expected for 1956, a 3% decrease over the provisional total of 1,524,000 marriages for 1955. It was anticipated that the estimated marriage rate of almost 9.4 for 1956 would exceed the revised rates of 9.3 for 1955 (the second lowest rate since 1933) and the final rate of 9.2 for 1954 when 1,490,000 marriages were performed. No change in the birth rate of 24.9 for 1955 (4,041,000 registered births) seemed likely in 1956, although the number of births was estimated at 4,129,000. The number of divorces, including annulments, forecast for 1956 was 376,000 in contrast with 373,000 divorces in 1955 and the revised final total of 379,000 in 1954.

Findings from other studies indicated that about 12,000 divorces and annulments occurred annually in New York state of which about 30% were annulments; that 87% of all women aged 25-34 years were married; that, of wives aged 14-24 years,

Table I.—Percentage Distribution of Marriages by Age of Bride and Groom: 23 Reporting U.S. States, 1954

Age of bride (years)	First marriages	Remarriages	All marriages*	Age of groom (years)	First marriages	Remarriages	All marriages*
Under 15	0.3	0.0	0.3	Under 15	0.0	0.0	0.0
15-19	45.2	3.3	35.3	15-19	14.5	0.2	11.3
20-24	38.5	15.2	32.8	20-24	51.3	7.3	41.2
25-29	8.9	17.2	10.8	25-29	21.3	15.5	19.9
30-34	3.3	15.2	6.1	30-34	6.5	14.7	8.4
35-39	1.7	13.1	4.5	35-39	2.9	13.1	5.2
40-44	1.0	10.9	3.4	40-44	1.6	11.7	3.9
45-49	0.5	8.6	2.5	45-49	0.9	9.7	2.9
50-54	0.3	6.2	1.7	50-54	0.5	7.9	2.2
55-59	0.1	4.2	1.1	55-59	0.3	6.4	1.7
60-64	0.1	3.1	0.8	60-64	0.2	5.1	1.3
65-69	0.0	2.0	0.5	65-69	0.1	4.5	1.1
70 and over	0.0	1.1	0.3	70 and over	0.0	3.9	1.0

*Includes previous marital status not mentioned.
Source: "Marriages, Detailed Statistics for Reporting Areas, 1954," U.S. Department of Health, Education and Welfare, National Summaries, vol. 44, no. 6, p. 108.

Table II.—Percentage Distribution of Divorces and Annulments by Number of Children Reported: 22 Reporting U.S. States, Alaska, Hawaii and the Virgin Islands, 1954

Area	None	One	Two	Three	Four	Five	Six or more
22 U.S. states*	52.2	23.1	14.4	6.3	2.4	1.0	0.7
Alaska	57.1	19.4	13.2	6.0	3.4	0.9	0.0
Hawaii	30.1	23.0	18.0	13.8	7.7	4.1	3.4
Virgin Islands	45.5	21.1	16.3	8.1	5.7	1.6	1.6

*Includes all minor children under 21 years of age (Connecticut), all dependent children under 17 years (Michigan) and 21 years (North Dakota), all children under 21 years (New Hampshire), total number of children (Oregon), all minor children (Mississippi), all children affected (Vermont), minor children affected (Virginia), and data not complete for Georgia, Michigan, Missouri and Wyoming.
Source: Adapted from Table B, "Divorces and Annulments, Detailed Statistics for Reporting Areas, 1954," U.S. Department of Health, Education and Welfare, National Summaries, vol. 44, no. 7, p. 139.

only 78% were living in their own households and only 71% had children; that, in 1955, 3.3% of all men and 16.7% of all women aged 15-19 years were married, in contrast respectively to 0.5% and 9.5% in 1890; that about 70% of all persons 15 years old and older were presently married; that 54% of all widows were employed; that, of married couples, about half had at least one child within the first two years of marriage; that, of all persons

MARRIAGE OF GRACE KELLY AND PRINCE RAINIER III of Monaco, April 19, 1956, at St. Nicholas cathedral, Monaco



marrying in 1954, 75.6% were single, 17.8% were divorced and 6.6% were widowed (*see* Table I); that third marriages occurred about one-seventh as often as second marriages; and that the rate of multiple marriage among women was 4% greater than among men.

Great Britain.—For England and Wales, 357,431 marriages and 664,711 births were provisionally reported for 1955. Although the number of marriages was 4.8% higher than the lowest postwar total of 341,731 in 1954, the number of births was 1.3% lower than the total of 673,651 in 1954 (the lowest number since 1942). Of the 26,816 absolute decrees and annulments in 1955 (a drop of 4.3% from the 28,816 granted in 1954), it was estimated that 10% were comprised of marriages of less than five years' duration, with the median duration of all legally terminated marriages falling between 11 and 12 years; approximately one-third of all divorces were received by childless couples. It was expected that not more than 360,000 marriages, 660,000 births and 25,000 divorces would be recorded in 1956. As of Nov. 1955 there were in England and Wales about 70,000 women living apart from their husbands and about 16,000 unwed mothers who were drawing assistance grants from the government.

Canada.—It seemed probable that marriage and birth rates in 1956 would show no significant change from those of 1955. The low marriage rate was expected to continue for several years. Of all the provinces, Quebec had shown the most rapid decline in birth rate in recent years. Although parliament had repeatedly rejected proposals to liberalize divorce laws of the country, Saskatchewan and other western provinces intensified their efforts in that direction. The Montreal Marriage Counselling centre opened on Sept. 7, 1955, reported increasing interest in its facilities.

Other Countries.—In China the birth rate continued high; Hong Kong was taking steps to expand its family planning clinics. Marriage rates in Denmark and the Netherlands were counted among the highest in Europe. In France the government increased its maternity leave of women workers to six weeks before and eight weeks after childbirth. The government-sponsored birth control program in India, including 165 clinics, experienced difficulty in getting mothers to practise the rhythm method successfully. The Pakistani government advisory Commission on Marriage and Family Laws recommended drastic changes in existing marriage and divorce legislation. Although divorce is not possible in Italy, about 4,000 court annulments and legal separations were being obtained annually; the marriage rate was reported to be the lowest in Europe. In Japan the number of abortions was estimated to exceed the 1,170,000 in 1955 which almost equalled the 1,727,040 live births for that year; it was estimated that, since the war, about 25,000 American men had married Japanese women. The code of family legislation in Rumania was revised to permit divorce to be granted upon demand of either spouse. The sex education program in Sweden, beginning with the child's first year in school and carried through continuously to age 19 years, was reaffirmed to stress the importance of love in human relationships. In the U.S.S.R. a campaign was launched against immorality, deserting husbands and bigamous marriages. The marriage rate continued to be high in western Germany; based on marriages in 1953, 39% were Protestant, 35% were Roman Catholic, 21% were mixed religiously, with 5% falling in miscellaneous categories.

In Africa, Algeria reported that 37,000 men had two wives and 1,800 had three or more; Egypt increased its birth control clinics to eight; marriage counselling facilities were expanded in Kenya and Nigeria; although there was only one divorce for every seven marriages in the Union of South Africa, the rate was two in seven in Johannesburg.

In South America the recent laws permitting divorce in Argen-

tina were repealed; it was reported that courses in eugenics were a part of the curriculum in most Brazilian schools.

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(C. R. A.)

Marshall, Caroline and Mariana Islands.

The Marshall, Caroline and Mariana Islands, stretching from about 1° to 20° N. lat., and from 130° to 170° E. long., constitute, with the exception of Guam (*q.v.*) in the Marianas, the Trust Territory of the Pacific Islands. The territory contains about 2,130 islands in 96 distinct island groups of which 64 are inhabited, with a combined land area of about 687 sq.mi. Truk in the centre of the territory is 4,931 mi. W. of San Francisco and 1,832 mi. E. of Yokohama. The population on June 30, 1956, totalled 65,039, exclusive of administrative and military personnel. Three-fifths of the population live on the six principal island units: Saipan, the Palaus, Yap, Truk, Ponape and Majuro. Eleven different languages are spoken in the territory, including English and Japanese. The majority of the population is Christian. Acting high commissioner in 1956, Delmas H. Nucker.

History.—Although plans existed for creating a territorial legislature, it had not by 1956 been considered feasible to implement them in view of such problems as the absence of a territory-wide political consciousness. Each of the seven administrative districts had its own native congress acting as an advisory body to the district civil administrator.

On March 9, 1956, representatives of the Marshall Islands congress submitted a petition to the United Nations visiting mission in which they reiterated their petition of April 1954, expressing the desire that the 1956 nuclear tests in the Marshall Islands should cease, or that, if considered "absolutely necessary for the eventual well-being of all the people of this world," they should be conducted with all feasible precautions. In the discussions in the Trusteeship council on the petition, the representatives of the United States pointed out that the U.S. was seeking an effective international disarmament agreement but that until such an agreement was reached and as long as there was the threat of aggression, the tests had to be continued. The many precautions which the U.S. was taking were detailed. On March 29, 1956, the Trusteeship council by a vote of 9 to 4 approved a resolution calling to the attention of the Marshallese petitioners the observations of the U.S. as the administering authority of the territory, and recommended that all necessary measures should be taken "to guard against any possible dangers," to settle forthwith all justified claims arising out of the 1954 tests, and to compensate for any losses resulting from further nuclear tests.

Education.—On June 30, 1955, there were 156 public schools, of which 149 were elementary, 6 were intermediate, and one (Pacific Islands Central school at Truk), an advanced technical and normal school. These schools had 7,387 pupils and 416 teachers. There were also 26 elementary and intermediate mission schools with 1,782 pupils and 104 teachers. Instruction is in English except in the first three grades where the native dialect is used. Educational expenditures represented 5.8% of total expenditures during fiscal year 1954-55.

Finance.—During the fiscal year ending June 30, 1956, local revenues were estimated at \$1,330,000 and U.S. appropriated funds \$5,000,000. Expenditures were estimated at \$6,566,163. A branch of the Bank of America operates on Saipan. Banking services for inhabitants of areas other than Saipan are available at the Bank of America branch on Guam.

Production and Trade.—About 30,000 ac. (47 sq.mi.), or 7% of the total land area, is under cultivation. The economy of the territory is based upon three commodities: copra, which utilizes about two-thirds of the cultivated land of the territory and whose production totalled 12,372 short tons in the year ending June 30, 1955; trochus, 315 short tons; and handicrafts, \$40,000. Experimental production of cacao, with more than 100,000 trees planted on the island of Babelthup in the Palaus, continued in 1956. Other principal crops are maize, sorghum, taro, sweet potatoes, cassava, breadfruit, bananas, papaya and citrus fruit. The production of phosphate rock on Angaur in the western Caroline Islands terminated on June 30, 1955, since the limit to which productive agricultural land could

safely be mined had been reached. A survey of mineral resources of the territory was begun in the spring of 1956.

As of June 30, 1955, the territory had 3,155 cattle, 135 carabao, 17,764 wine, 113,236 chickens, 1,564 ducks and 3,370 goats. The territory also had a small soap factory, a sawmill and a boatyard. Forested areas covered 10,000 ac., 20% of which was mangrove.

In the fiscal year ending June 30, 1955, the value of exports totalled \$4,301,582, of which phosphate rock represented \$2,744,500, copra \$1,334,115 and trochus \$119,671. Imports were valued at \$2,487,529; the most important were food, clothing and tobacco. The U.S. and Japan were the major sources and destinations of the territory's imports and exports.

Transportation and Communications.—Air transportation in the territory, except in the Saipan district, is maintained by Transocean Airlines, a commercial company which operates a fleet of 3 amphibious planes owned by the government; 3,151 passengers and 134 tons of cargo and mail were carried in the year ending June 30, 1955. There are 3 civil airfields in the territory. Pacific Micronesian Lines, Inc. operates 8 vessels under contract from the trust territory government. There were more than 353 mi. of roads in the territory in 1955. Only Saipan had paved roads. There were privately owned broadcasting stations (at Majuro and at Truk), 7 U.S. post offices and 313 telephones. A monthly newspaper is published by the trust territory government for distribution throughout the territory.

(S. Nr.)

Martinique. This French overseas island *département* in the Lesser Antilles has an area of 425 sq.mi. Pop. (1946 census) 261,595; (1954 census) 239,130, mainly coloured (Negro or mixed). Language: French and creole French. Religion: Roman Catholic. Capital: Fort-de-France, pop. (1954 census) 58,763.

Prefect in 1956, Gaston Villéger.

History.—In the elections to the French national assembly held on Jan. 2, 1956, two communists retained their seats. The third seat was held by a Socialist. For sugar cane, the year was not a good one. Heavy rains had diminished the sugar-content of the cane, and go-slow strikes had delayed harvesting.

Gen. Charles de Gaulle arrived in Martinique on Aug. 13. He visited Fort-de-France, Saint-Denis and the southern areas of the island.

(Hu. DE.)

Foreign Trade.—(1955) Monetary unit: metropolitan franc, valued at 100 fr. to U.S. \$1. Budget included in that of France. Imports 13,000,000 fr.; exports 9,000,000,000 fr. Principal exports: sugar, bananas, rum.

Maryland. One of the original states of the United States, long known as the "Old Line state" and, in later years, as the "Free state," Maryland is bounded on the north by Pennsylvania and Delaware, on the east by Delaware and the Atlantic ocean and on the south and west by Virginia and West Virginia. The total area is 10,577 sq.mi., of which 696 sq.mi. is water. Pop. (1950 census) 2,343,001; (July 1, 1956, provisional est.) 2,812,000. Urban population in 1950 was 69% of the total. Annapolis (1950 pop., 10,047) is the capital. Other cities in the state (1950 population) are Baltimore 949,708, Cumberland 37,679, Hagerstown 36,260, Frederick 18,142 and Salisbury 15,141.

History.—During 1956 the state continued the huge program for improving the public roads system which had been inaugurated in 1953 as a so-called 12-year roads program. It originally was to entail an expenditure of approximately \$568,000,000, in addition to normal expenditures on the road system, but by 1956 increasing price levels were making it difficult to complete the program within the estimated limits. Work was continued on the vehicular tunnel under Baltimore city harbour, scheduled for completion in Dec. 1957.

The state budget enacted in 1956 totalled approximately \$300,000,000 and was the largest in the history of the state. Despite the sharply increasing expenditures, a rising level of revenues continued to make unnecessary any important increase in taxes. The general assembly, at a special session in March 1956, enacted legislation to create a Maryland port authority to have primary responsibility for the administration, control and advertising of the port of Baltimore and of other ports within the state.

The principal state officers in 1956 were: governor, Theo-

dore R. McKeldin, Republican; comptroller, J. Millard Tawes, Democrat; attorney general, C. Ferdinand Sybert, Democrat.

In the Nov. 6, 1956 elections, Pres. Dwight D. Eisenhower received a margin of more than 187,000 votes over Adlai E. Stevenson. Sen. John M. Butler, Republican, and each of the seven incumbents in the U.S. house of representatives were re-elected. Seven proposed amendments to the state constitution were adopted by the voters.

Education.—In 1955-56 there were 787 public elementary and occupational schools in the state (including Baltimore city), with a total fall enrolment of 305,983 and a teaching staff of 9,991. There were 225 secondary and vocational schools, with an enrolment of 175,738 and a teaching staff of 7,849. The enrolment in Catholic schools for the entire state was 82,960. The enrolment in non-Catholic private schools was 17,239. Thomas G. Pullen, Jr., was state superintendent of schools.

Social Insurance and Assistance, Public Welfare and Related Programs.—As of June 30, 1956, old-age assistance was being given to 10,204 persons, with a total cost of \$5,704,726 for the fiscal year ended June 30, 1956; public assistance was being given to 470 needy blind persons, with a total cost of \$300,570 for the fiscal year; aid to dependent children was being given to 6,251 families, with a total cost of \$7,172,011 for the fiscal year; and 5,075 persons were receiving aid to the permanently and totally disabled, with a total cost of \$3,189,805 for the fiscal year.

As of June 30, 1956, there were 2,035 white inmates and 2,997 Negro inmates, or a total of 5,032 inmates, in the five penal institutions under the jurisdiction of the department of correction. Of these, 72 were white females and 110 were Negro females.

Communications.—The State Roads commission expended \$130,621,566.88 for the fiscal year ended June 30, 1956. The total road mileage in the state highway system, as of Jan. 1, 1956, was 4,625.36, in the county system 13,036.85 and in the municipalities 1,342.03. As of June 30, 1956, there were 1,320 line miles and 2,800 track miles of steam railways and 22.9 line miles and 28.4 track miles of electric interurban railways. As of June 30, 1956, there were 969,631 telephone instruments in service in the state, of which 382,320 were in Baltimore city. There were 4,108,965 mi. of wire, of which 1,914,147 mi. were in underground cable as of June 30, 1956.

Banking and Finance.—On June 30, 1956, there were 96 state banks and trust companies doing business in Maryland, with total deposits as of that date of \$1,120,424,629.78 and total resources of \$1,229,691,254.76. There were eight mutual savings banks doing business in Maryland as of the same date, with total deposits of \$508,487,309.33 and total resources of \$557,589,227.90. There were 57 national banks in the state with deposits of \$904,025,000 and total resources of \$983,960,000. Total resources of all state and national banks were \$2,771,240,482.66. As of Dec. 31, 1955, savings and loan and building and loan associations were computed to have assets of \$905,158,098. State appropriations for the year ended June 30, 1956, were \$268,531,248 and expenditures were \$474,597,974. Estimated appropriations for the year ending June 30, 1957, were \$300,632,271. The general surplus as of June 30, 1956, was \$26,728,006.39, and the outstanding bonded indebtedness was \$137,075,000.

Agriculture.—Maryland farmers received an estimated \$70,053,000 from the marketing of the principal farm crops during the year 1955, as compared with \$83,426,000 in 1954. Cash receipts from livestock and livestock products amounted to \$161,248,000 as compared with \$158,328,000. Government payments during the year 1955 were approximately \$961,000 as compared with \$1,392,000 in the year 1954.

Table I.—Leading Agricultural Products in Maryland

Crop	Indicated		Average, 1945-54
	1956	1955	
Barley, bu.	3,560,000	3,256,000	2,464,000
All corn, bu.	26,235,000	21,020,000	20,922,000
Oats, bu.	2,432,000	2,911,000	1,610,000
Wheat, bu.	4,550,000	4,744,000	5,828,000
Hay (all), tons	735,000	687,000	640,000
Potatoes (Irish), cwt.	492,000	556,000	671,000*
Tobacco, lb.	46,250,000	35,525,000	38,469,000
Soybeans for beans, bu.	4,853,000	3,100,000	1,235,000
Tomatoes (market), bu.	459,000	476,000	607,000*
Tomatoes (processing), tons	110,400	68,500	161,700
Potatoes (sweet), cwt.	480,000	517,000	521,000*
Cantaloupes, crates (83 lb.)	140,000	130,000	187,000*
Sweet corn (processing), tons	86,500	55,000	84,800
Lima beans (market), bu.	120,000	102,000	116,000
Lima beans (processing), tons	2,610	2,000	2,860
Snap beans, early (market), bu.	306,000	272,000	305,000
Snap beans, fall (market), bu.	81,000	76,000	86,000
Snap beans (processing), tons	18,900	14,700	16,800
Green peas (processing), tons	10,500	12,920	10,200*
Apples, (commercial), bu.	900,000	1,137,000	1,134,000
Peaches, bu.	415,000	475,000	454,000
Strawberries, crates (24 qt.)	162,000	152,000	152,000*

*1949-54 average.

Source: Maryland-Delaware Crop Reporting Service.

Manufacturing.—The Maryland employment security board estimated the number of manufacturing establishments covered by unemployment compensation as of Dec. 31, 1955, to be 3,205 employing 264,860 persons as compared with 3,178 employing 246,003 in Dec. 1954; and the nonmanufacturing establishments to be 40,582 employing 411,469 persons as compared with 39,122 employing 385,918 in Dec. 1954.

The total payroll for the year 1955 was \$1,093,346,049 in manufacturing and \$1,265,797,742 in nonmanufacturing, making total payrolls for the year \$2,359,143,791 as compared with \$2,152,388,805 for the year 1954.

The amount of unemployment compensation benefits paid during the benefit year ending March 31, 1956, was \$15,601,531 as compared with \$32,271,505 in the benefit year ending March 31, 1955. (C. N. E.)

Table II.—Principal Industries of Maryland

Product	All employees 1954	Salaries and wages 1954 (in 000s)	Value added by manu- facture 1954	Value added by manu- facture 1953
			(in 000s)	(in 000s)
Food and kindred products	39,722	\$129,605	\$258,091	*
Textile mill products	3,781	11,738	16,356	\$18,602
Apparel and related products	24,424	63,929	107,328	123,909
Furniture and fixtures	4,490	14,499	22,762	*
Paper and allied products	7,496	28,631	52,689	35,573
Printing and publishing industries	10,656	45,050	72,297	81,530
Chemicals and allied products	12,632	51,631	144,478	182,863
Petroleum and coal products	3,434	16,671	34,268	32,964
Rubber products	6,280	22,941	43,150	39,043
Stone, clay and glass products	7,210	27,310	59,553	67,835
Primary metal products	32,042	146,212	339,576	319,870
Fabricated metal products	17,593	71,515	139,608	134,056
Machinery (except electrical)	11,468	48,359	75,767	81,227
Transportation equipment	41,050	193,425	322,960	309,341
Miscellaneous manufactures	11,087	40,851	61,262	38,677

*Withheld because the estimate did not meet publication standards, either on the basis of the associated standard error of estimate or on the basis of a consistency review.
Source: U.S. Department of Commerce, 1954 Census of Manufactures, preliminary report.

Table III.—Mineral Production in Maryland

Mineral	(In short tons)			
	Quantity	Value	Quantity	Value
Total	1953	1954	1953	1954
Clays	671,000	\$27,085,000	627,000	\$30,743,000†
Coal	531,000	1,135,000	422,000	1,166,000
Coke*	3,269,000	2,442,000	3,078,000	1,879,000
Iron, pig*	3,753,000	?	3,787,000	?
Lime	72,000	708,000	67,000	685,000
Natural gas (000 cu. ft.)	1,408,000	268,000	1,394,000	282,000
Sand and gravel	7,380,000	8,919,000	10,098,000	12,172,000
Stone	3,578,000	6,275,000	5,065,000	8,266,000
Other minerals . . . . .	...	7,338,000	...	7,288,000

*Values for processed materials are not included in the totals.
†Total has been adjusted to eliminate duplication in the value of clays and stone.
Source: U.S. Bureau of Mines.

Mineral Production.—Maryland produces a variety of minerals. Table III shows the tonnage and value of those minerals whose value exceeded \$100,000 in 1953. In 1954 Maryland was first among the states in selenium output and produced and consumed more than 3,000,000 tons of coke; it stood 39th in the value of its mineral output, with 0.22% of the U.S. total.
ENCYCLOPEDIA BRITANNICA FILMS.—*Southeastern States*, 2nd ed. (1956).

Masonic Fraternity: see SOCIETIES AND ASSOCIATIONS, U.S.: *Freemasonry*.

Massachusetts. A north Atlantic state of the United States, Massachusetts was the sixth state to ratify the federal constitution. It was admitted to the union on Feb. 6, 1788. Its popular name is the "Bay state," derived from its earliest title "the Colony of Massachusetts-Bay" (1629-30). Area: 8,257 sq.mi., including 350 sq.mi. of water. Pop.: (U.S. census, 1950) 4,690,514, of which 84.4% was urban; (state census, 1955) 4,837,645. The capital is Boston (pop. 1955 census) 724,702. Important cities (with 1955 pop.) are: Worcester 202,612, Springfield 166,052, New Bedford 105,488, Fall River 105,195, Lynn 99,020, Cambridge 98,958, Somerville 97,032, Lowell 93,876, Newton 86,535, Quincy 84,495, Lawrence 76,094.

History.—The 163rd session of the legislature adjourned on Oct. 6, 1956 (the third longest session), after it had enacted 746 acts and 157 resolves. The total appropriation for general purposes amounted to \$363,219,000, an increase of \$39,070,689 over the preceding year. In addition to this total a capital outlay, covered by bonds of \$26,000,000, was provided to cover new buildings, including \$1,000,000 for a three-story underground bombproof vault to be constructed under the front lawn of the state house.

A new highway construction bill was enacted. Of the total appropriation of \$300,000,000 for this purpose, \$200,000,000 would be in a bond issue and \$100,000,000 in contract obligations for use when matching federal funds. The gasoline tax was increased one-half cent, raising the state tax to 5.5 cents.

Of major importance was a law creating the Massachusetts port authority. Like the New York port authority, this new body would finance, through bond issues up to a total of \$300,000,000, its own expansion and operating costs. It was authorized to build another tunnel or a bridge across Boston harbour, and immediately to manage and control all state-owned airports, the Summer tunnel, the Mystic river toll bridge and all the docks and

ITALIAN FREIGHTER AGROUND at Scituate, Mass., after a gale drove the ship into shore March 16, 1956



wharves operated by the Port of Boston commission. All of the above commissions and authorities were abolished.

A state senator, who as a young man had to give up his college course after the first year for lack of funds, filed a bill to create the Massachusetts Higher Education Assistance corporation. The bill was passed, so that now any student in any college who has finished one year may borrow funds from the corporation at low interest. Loans are to be paid back within a reasonable time after the borrower secures employment.

Other new legislation included a finance advisory board to advise the governor on bond issues, an interstate compact on mental health, extending insurance on deposits in savings and co-operative banks and establishing a historic districts commission for the town of Lexington.

State officials for 1955-56 were: governor, Christian A. Herter (Rep.); lieutenant governor, Sumner Whittier (Rep.); secretary of the commonwealth, Edward J. Cronin (Dem.); treasurer, John F. Kennedy (Dem.); attorney general, George Fingold (Rep.); auditor, Thomas J. Buckley (Dem.).

In the general election of Nov. 6, 1956, the state's 16 electoral votes went to President Dwight D. Eisenhower. The popular vote was about 1,390,000 for Eisenhower as against approximately 1,050,000 for Adlai E. Stevenson. In the state offices, Democrats were elected to succeed Republicans in two offices, Foster Furcolo as governor and Robert F. Murphy as lieutenant governor. The incumbent secretary of the commonwealth, treasurer, attorney general and auditor were re-elected.

Education.—In 1955 there were 1,708 public elementary schools with 23,055 pupils; 108 junior high schools with 90,938 pupils; 212 senior high schools with 138,179 pupils. The public schools of the state employed a total of 23,862 full-time teachers, principals and supervisors. Salaries for this group totalled \$123,178,178.97. The total expenditure for the public schools for support and outlay was \$221,052,349.02. John Desmond, Jr., was the state commissioner of education.

Social Insurance and Assistance, Public Welfare and Related Programs.—During the fiscal year ending June 30, 1956, old-age assistance was extended to an average monthly number of 87,285 persons at an annual cost of \$83,483,572; an average monthly number of 12,786 families received assistance for the care of 31,596 dependent children at an annual expenditure of \$19,829,726; general relief was extended to an average monthly number of 12,327 persons at an annual cost of \$9,460,254. Payments for unemployment insurance for 1955 totalled \$57,606,825, a decrease of \$3,505,293 from 1954.

For the year ending June 30, 1956, the commonwealth appropriated \$4,486,800 to maintain correctional institutions, including the new state prison in Walpole (498 inmates), prison colony (802 inmates), reformatory for men (620 inmates), reformatory for women (212 inmates) and the state farm (1,585 inmates) including the criminally insane.

Banking and Finance.—Revenue receipts of the commonwealth for the year ending June 30, 1956, were \$536,602,554.37, including the sale of bonds amounting to \$134,120,000. Expenditures for state government amounted to \$492,610,369.65. The direct gross debt was \$535,280,000 less sinking fund of \$6,915,702.64 for a net debt of \$528,364,297.36. The assessed valuation of the state as of Jan. 1, 1956, was \$8,589,023,684.

As of June 30, 1956, bank deposits in the savings banks amounted to \$633,357,844; total assets of commercial departments of trust companies \$335,171,000; bank deposits in savings departments of trust companies \$2,954,000; total assets of credit unions \$134,101,420; and total assets of co-operative banks \$953,102,069.

Agriculture.—Cash receipts from marketing of farm products in 1955 totalled \$171,449,000. This included total crop cash receipts of \$54,516,000 and total livestock products of \$116,933,000.

Table I.—Principal Crops of Massachusetts

Crops	Indicated 1956	1955	Average, 1945-54
Wheat, bu.	1,392,000	1,500,000	1,665,000
Oats, bu.	1,580,000	2,940,000	2,276,000
Barley, all, tons	401,000	454,000	514,000
Apples, cwt.	1,123,000	1,001,000	1,275,000
Pears, bu.	70,000	82,000	142,000
Apples, lb.	7,335,000	10,740,000	11,370,000
Strawberries, bbl.	475,000	546,000	553,800

Source: U.S. Department of Agriculture.

Manufacturing.—In 1956 there were 2,069 labour unions in Massachusetts; the total membership was 574,098, an increase of 9,160 over 1955. There were 564,938 members. In 1954 the total valuation of manufactured goods was \$8,548,465,916; total manufacturing employment was 300,000 in Aug. 1956, of which 544,400 were production workers. The gross weekly payroll of production workers was \$39,170,800. (D. A. Dy.)

Mineral Production.—Table III shows the tonnage and value of those minerals produced in Massachusetts in 1953 and 1954 whose value was 100,000 or more. In 1954 it ranked 41st among the states in value of mineral output with 0.14% of the U.S. total.

Table II.—Principal Industries of Massachusetts

	All employees 1954	Salaries and wages 1954	Value added by manufacture 1954	Value added by manufacture 1953
			(In thousands of dollars)	
Food and kindred products	48,655	\$175,937	\$313,355	\$254,870
Textile mill products	70,213	232,456	362,855	426,169
Apparel and related products	58,441	154,134	243,425	247,363
Furniture and fixtures	12,728	44,722	70,438	72,824
Paper, pulp and products	33,972	132,968	234,844	256,543
Chemicals and products	15,923	69,963	187,429	194,045
Petroleum and coal products	2,269	11,438	22,893	16,071
Rubber products	24,634	101,086	185,331	186,166
Leather and leather products	65,492	200,466	289,599	328,943
Stone, clay and glass products	10,399	44,795	76,191	83,368
Primary metal industries	18,801	84,194	138,707	150,307
Fabricated metal products	35,967	144,161	261,550	297,120
Machinery (except electrical)	76,603	334,353	537,006	624,176
Electrical machinery	75,581	288,509	545,100	588,864
Transportation equipment	23,601	112,550	176,745	254,202
Instruments and related products	17,999	71,309	129,479	121,700
Miscellaneous manufactures	46,563	164,798	258,802	284,713

Source: U.S. Department of Commerce, 1954 Census of Manufactures, preliminary report.

Table III.—Mineral Production of Massachusetts

Mineral	Quantity 1953	Value 1953	Quantity 1954	Value 1954
	(In short tons)			
Total		\$17,191,000		\$18,851,000
Clays	152,000	196,000	129,000	121,000
Coke	850,000	?	516,000	?
Iron, pig	127,000	?	106,000	?
Lime	135,000	2,156,000	128,000	1,709,000
Sand and gravel	7,308,000	5,931,000	9,640,000	8,366,000
Stone	3,458,000	8,821,000	2,942,000	9,040,000
Other minerals	?	87,000	?	13,000

*Values for processed materials are not included in the totals.
Source: U.S. Bureau of Mines.

ENCYCLOPEDIA BRITANNICA FILMS.—Massachusetts (1955); North-eastern States, 2nd ed. (1955).

Massey, Vincent (1887—), governor general of Canada, was born in Toronto, Ont., Feb. 20.

He was educated at St. Andrew's college, Toronto, the University of Toronto and Balliol college, Oxford. He was sworn in the privy council and appointed minister without portfolio in Sept. 1925. He was appointed the first Canadian minister to the United States in 1926 and held that post until 1930. He was high commissioner for Canada in the United Kingdom, 1935-46, and chairman of the royal commission investigating national development in the arts, letters and sciences, 1949-51. He became the first Canadian-born governor general of Canada on Feb. 28, 1952.

On Jan. 9, 1956, Massey gave a state dinner and reception on the eve of the opening of parliament, which he formally opened on Jan. 10. He made a 10,000-mi. tour of the north from March 20 to April 6, being the first governor general to visit the high arctic and to fly over the north pole. During the year he paid official visits to many parts of Canada, filling speaking and other engagements.

Massey was host to a number of prominent visitors, including Great Britain's Prime Minister Sir Anthony Eden, and Foreign Secretary Selwyn Lloyd, and the president of Indonesia, Achmed Sukarno and his party.

In 1956 Governor General Massey was named to remain in office until the spring of 1958. (M. L. S.)

Mathematics. The year 1956 saw a major development in the theory of manifolds, a topic of central interest in 20th-century mathematics.

A manifold is a space which is built up by "pasting together" pieces that look like ordinary Euclidean space. If the dimension of the Euclidean space is n , the manifold is called n -dimensional. Where two pieces overlap, they give rise to competing co-ordinate systems, and the manifold is called "differentiable" if this change of co-ordinates takes place via functions which can be differentiated (in the sense of ordinary calculus). Another approach to the study of manifolds is to require instead that the pieces be simple solids (such as triangles or cubes and their

analogues in higher dimensions) and that they fit together snugly along corners and edges. This is known as "triangulating" the manifold.

Two problems had thus arisen: (1) Is every manifold differentiable? (2) Can every manifold be triangulated?

Each of these carries with it a uniqueness problem: (3) Are two differentiable co-ordinate systems on a manifold equivalent (under a differentiable transformation)? (4) Given two triangulations of a manifold, can each be further decomposed until the two triangulations look the same? This is the so-called *Hauptvermutung* (principal conjecture) of combinatorial topology.

It had been proved by S. S. Cairns that any differentiable manifold can be triangulated, so that an affirmative answer to (1) carried with it an affirmative answer to (2). In dimensions two and three, T. Rado and E. Moise, respectively, had answered all questions affirmatively.

J. W. Milnor of Princeton university found that the answer to (3) is "no." The manifold which admits two different differentiable co-ordinate systems is surprisingly simple: the seven-sphere (all points at unit distance from the origin in eight-dimensional Euclidean space). In addition he discovered an eight-dimensional triangulated manifold for which either (1) or (4) must be false. These new developments indicated that manifolds were more subtle objects than had been previously imagined. Much new research was needed to clarify the situation.

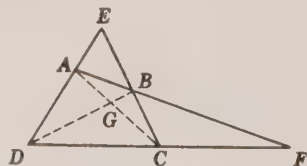
The impact of topology was visible on a century-old problem in algebra. A division algebra (over the real numbers) is a system in which all the ordinary rules of algebra hold except that the associative law $(xy)z = x(yz)$ is not required. Examples are furnished by the real numbers, complex numbers, quaternions and Cayley numbers, which have dimensions 1, 2, 4 and 8 respectively. H. Hopf had proved that the dimension of a division algebra must in fact be a power of 2. Now, H. Toda of Japan showed that dimension 16 is impossible. The proof used the intricate techniques of modern topology and required formidable computations.

In mathematical logic, the event of the year was the solution of a problem posed in 1944 by E. L. Post. The problem concerned recursively enumerable sets. These, roughly speaking, are sets of integers which can be listed by an effective computational procedure. There is an appropriate principle of classification for such sets. Post had exhibited two types and asked if there were still others. It turned out that there were infinitely many, and this was discovered nearly simultaneously by A. Muchkin of the U.S.S.R. and Richard Friedberg, a 19-year-old senior at Harvard university.

In the field of finite projective planes there was a further advance.

Let a quadrilateral $ABCD$ be given. The figure exhibits the three additional points E , F and G which are added to get the complete quadrilateral. Ordinarily the three new points do not lie on a line. But in a bizarre geometry using a number system where $1+1=0$, they are collinear. This was first noticed by G. Fano, and so a projective plane is called a Fano plane if E , F and G are always collinear. A. M. Gleason of Harvard university proved that any finite Fano plane is Desarguan and hence completely known.

The outstanding new book in the field of mathematics was the treatise *Homological Algebra* by H. P. Cartan (France) and S. Eilenberg (U.S.). A new vigorous branch of algebra was thereby officially launched. It had already shown its merit by solving several old problems that had been previously inaccessible. It was widely anticipated that even greater triumphs lay



ahead.

(I. K.)

Maurice and Laura Falk Foundation, The: see SOCIETIES AND ASSOCIATIONS, U.S.

Mauritania: see FRENCH UNION; FRENCH WEST AFRICA.

Mauritius. British colony in the Indian ocean, about 500 mi. E. of Madagascar, with island dependencies, of which the largest is Rodrigues, about 365 mi. N.E. of Mauritius. Area: Mauritius 720 sq.mi.; Rodrigues 40 sq.mi.; other dependencies (Chagos archipelago including Diego Garcia, Agalega and Cargodos Carajos or St. Brandon groups) 45 sq.mi. Pop. (1952 census, 1955 est. in parentheses): Mauritius 501,471 (549,000 including about 68% Indo-Mauritians [Indian immigrants and their descendants]); Rodrigues 13,333 (15,000 mostly of African descent); Diego Garcia and other dependencies 1,752 (2,000). Languages: English and French (official); creole French and Hindi widely used. Religion: Indo-Mauritians mainly Hindu; others mainly Roman Catholic. Chief towns (pop., Dec. 1954 est.) Port Louis (cap.) 74,950; Beau-Bassin and Rose Hill 30,400; Curepipe 23,750. Governor in 1956, Sir Robert Scott.

History.—On Sept. 25 the legislative council elected 4 out of 12 ministers, the remainder to be nominated by the governor or to be ex officio members. This was, in part, fulfilment of proposals announced in March by the secretary of state for the colonies, A. T. Lennox-Boyd, for an increase in the membership of the executive and legislative councils and the introduction of a ministerial system. The legislative council had accepted the proposals in May after criticizing the scheme of proportional representation. The increase in legislative council membership was to take place in 1958. Princess Margaret visited the colony in September. (K. I.)

Education.—(1955) Schools: primary 315, pupils 85,438, teachers 2,455; secondary 65 (including 3 government and 8 grant-aided), pupils 10,268, teachers 532; teachers' training college 1, students 184. College of agriculture, students (1952) 80.

Finance and Trade.—Monetary unit: Mauritius rupee, valued at 21 cents U.S. and 1s. 6d. sterling. Budget (1954-55 actual; 1953-54 in parentheses): revenue Rs. 121,805,177 (Rs. 97,778,504); expenditure Rs. 115,071,316 (Rs. 94,044,553). Foreign trade (1955): imports Rs. 250,472,247; exports Rs. 241,341,789. Principal exports: sugar, molasses, rum (97% of all exports), fibre. Production (metric tons): sugar (1954 *tel quel*) 499,000; molasses (1953) 40,537; rum 49,625 hl.; aloe fibre (1953) 506 metric tons.

Meany, George (1894-), U.S. labour leader, was born on Aug. 16 at New York city and was educated in the public schools of the Bronx, N.Y. In 1910 he began plumbing apprenticeship and in 1922 entered labour organizational affairs as business representative of a plumbers' local union in New York city. From 1934 to 1939 Meany was head of the New York state federation of labour and then secretary-treasurer of the American Federation of Labor, of which he was named president Nov. 25, 1952, by the federation's executive council after the death of William Green (1873-1952). Meany was confirmed as president at the union's national convention in Sept. 1953 and was re-elected to the office in 1954. Frequently critical of the Eisenhower administration, particularly after the resignation of Martin P. Durkin as secretary of labour in Sept. 1953, Meany soon was the acknowledged "first man" of the A.F. of L. Meanwhile negotiations had been under way for a merger of the A.F. of L. and its long-time rival, the Congress of Industrial Organizations. The merger was accomplished in Dec. 1955, and Meany was elected president of the combined organization. He was recipient of the 1955 Laetere medal of Notre Dame university as outstanding U.S. Roman Catholic layman in that year.

Speaking before the Democratic convention's platform committee at Chicago, Ill., on Aug. 10, 1956, Meany recommended a federal minimum hourly wage of \$1.25 and tax cuts in the lower-income brackets. At an A.F. of L.-C.I.O. executive meeting

on Aug. 28 he abstained from voting on a resolution to endorse formally the Democratic national ticket of Adlai E. Stevenson and Estes Kefauver.

Table II.—Production of Meats in Principal Producing Countries

(In millions of pounds, carcass meat basis)

Country	Beef and veal			Pork, excl. lard		Mutton, lamb and goat		
	1955	1954	Average 1946-50	1955	1954	Average 1946-50	1955	Average 1946-50
United States . . .	15,212	14,647	10,978	11,016	9,952	10,541	758	734
Argentina	4,189	3,957	4,284	315	298	391	287	259
France	3,108	2,998	1,937	1,875	1,830	1,350	254	243
Brazil		2,376	2,114		571	512	86	69
Western Germany .	1,684	1,728	1,060	3,285	2,865	1,530	53	59
Australia	1,710	1,621	1,226	217	204	210	859	857
United Kingdom .	1,540	1,672	1,230	1,580	1,570	500	387	457
Canada	1,279	1,225	1,043	1,019	917	956	34	31

Meat. The production of red meats in the United States continued at a very high level in 1956, and that of poultry at new record levels. Red meat production, not including farm slaughter, during the first eight months was 17,453,000,000 lb., 8% more than the 16,089,000,000 lb. produced during the corresponding months of 1955.

Table I.—U.S. Meat Production
(In millions of pounds, dressed weight)

	1957*	1956	1955	1950	Average 1935-39
Red meats†					
Beef	14,000	14,300	13,568	9,538	6,937
Veal	1,600	1,600	1,578	1,230	1,038
Lamb and mutton .	725	740	758	597	870
Pork (excl. lard) . .	10,900	11,285	10,991	10,714	7,337
Total	27,225	27,925	26,895	22,079	16,182
Poultry‡					
Meat	5,200	5,065	4,373	3,782	2,018
Total	32,425	32,990	31,268	25,861	18,200

*Forecast by U.S. Department of Agriculture.

†Carcass weight equivalent.

‡Chickens, including commercial broilers and turkey, ready-to-cook basis.

Consumption per capita appeared to be about 163.5 lb., slightly above the 161 lb. of 1955 and 29% above the prewar level, and perhaps exceeding the record 163 lb. of 1908. Included were record amounts of beef indicated at 83.5 lb. per capita and large but not record amounts of pork, forecast at 66.3 lb. per capita. Veal, at 9.3 lb. per person, approximated the 1955 level but was above the 8.1 lb. of prewar, whereas lamb and mutton consumption of 4.4 lb. per capita was low compared with 4.6 lb. in 1955 and 6.7 lb. prewar. Chicken consumption amounted to a record 23.4 lb. per capita as compared with 20.9 lb. in 1955 and 13.2 lb. prewar. The record supply of turkey, 5.4 lb. per capita compared with 4.3 lb. in 1955 and 2.1 lb. prewar, included unusual numbers of the larger type fowl. Even the fish catch of 5,000,000,000 lb. was a new record, breaking the 1941 total of 4,900,000,000 lb.

Meat prices were relatively low early in the year under pressure from large pork production, which was about 16% higher during the first six months as compared with the same period of 1955, and large quantities of high-grade beef. During the first quarter of the year the index of retail meat prices stood at 93 (1947-49=100) as compared with 102 a year earlier. Meat prices, especially beef prices strengthened during the second half of the year, to a level above that for 1955. But broiler prices broke an eight-year low to less than 17 cents per pound.

Exports of meats increased in 1955-56; 52,156,000 lb. of beef and veal valued at \$14,562,000 were shipped out as compared with 42,742,000 lb. valued at \$11,449,000 in the preceding year. Pork exports also increased to 71,080,000 lb. as compared with 63,011,000 lb. in 1954-55. Imports of beef increased to 114,326,000 lb. valued at \$33,091,000 from 99,948,000 lb. valued at \$29,851,000 in 1954-55. Pork imports were slightly lower with 159,125,000 lb. as compared with 167,543,000 lb. during the previous year. Complaints about increased imports of Polish ham continued; canned pork, mostly ham, from Poland increased to 18,210,000 lb. in the first eight months of 1956 as compared with 15,037,000 lb. in the same months of 1955.

A special U.S. department of agriculture pork buying program to encourage additional consumption of pork and give assistance to the price of hogs was begun in Nov. 1955 but suspended in April 1956. Nearly 159,000,000 lb. of canned and frozen pork, about 5% of the production for that period, were purchased as well as nearly 39,000,000 lb. of lard, for a total of \$99,500,000. The products were disposed of mostly in the school-lunch program and abroad.

Meat production in the principal livestock producing countries, exclusive of the far east, set a new record of 86,522,000,000

lb., in 1955, 3% more than for the preceding year, 29% more than average for early postwar (1946-50) years and 27% more than prewar. Only South American production lagged in 1955 compared with 1946-50.

World trade in meats in 1955 was about 7% larger than in 1954; the increase continued in 1956.

Argentina authorized larger exports of chilled beef to the United Kingdom, with exports expected to total about 270,000 tons as compared with 107,610 tons in 1955. The U.S.S.R. took sizable amounts, especially of mutton and lamb. New Zealand's meat exports reached a record level in excess of 400,000 tons.

(See also LIVESTOCK.)

(J. K. R.)

ENCYCLOPEDIA BRITANNICA FILMS.—Meat—From Range to Market (1956).

Medical Rehabilitation of the Disabled.

One of the most significant developments in medical rehabilitation in the United States during 1956 was the increased emphasis given the teaching of rehabilitation by the nation's medical schools. The first department of physical medicine and rehabilitation to be established as a major department in a medical school was that at New York university in 1946.

Since then, three-fourths of the nation's medical schools had started co-ordinated teaching programs both to bring undergraduate medical students the basic principles of rehabilitation and to train specialists within the field.

These efforts started originally with the Baruch Committee on Physical Medicine, which gave grants in 1944 to Columbia university, New York university and the Medical College of Virginia, Richmond, for this purpose. In 1954 the National Foundation for Infantile Paralysis initiated a program of three-to-five-year financial grants to 13 medical schools. By 1956 additional support to ten other medical schools was being given by the office of vocational rehabilitation, United States department of health, education and welfare. Both organizations also had extensive fellowship training programs for specialists in rehabilitation.

Among the medical schools starting new programs during 1956 were Washington university, St. Louis, Mo.; University of Southern California, Los Angeles; University of Nebraska, Lincoln; University of Vermont, Burlington; and Duke university, Durham, N.C.

The organization of these programs varies with individual medical schools. Some organize departments of physical medicine and rehabilitation; others use a multidiscipline, committee approach. In both instances, however, the objective is to teach the basic concepts of rehabilitation to medical students and practising physicians.

More than \$2,000,000 was made available during the year by the office of vocational rehabilitation to educational institutions and individuals to help relieve the shortage of rehabilitation personnel. Teaching grants were given to 154 colleges and universities to expand programs in medicine, social work, nursing, occupational therapy and physical therapy, and more than 2,000 individual traineeships were awarded.

In Great Britain there was continuing emphasis during the year on rehabilitation services for disabled miners, there being a

manpower shortage in the coal mining industry. Although miners form only 3% of the total population, miners absorb nearly 40% of the industrial injuries benefits. Of the approximately 2,750 disabled miners discharged from eight special miners rehabilitation centres, about two-thirds returned to full employment and 94.5% of this group returned to the mining industry.

The primary international professional meeting of rehabilitation workers during 1956 was the second congress of the World Confederation for Physical Therapy in New York city in June. The congress was attended by 2,300 persons, of whom more than 500 came from outside Canada and the United States. The meeting pointed up the serious shortage of trained physical therapists in the United States. The U.S. had a ratio of 1 therapist per each 22,000 population as compared with 18,000 in Canada, 6,000 in Great Britain and 2,600 in Sweden.

Throughout 1956, United Nations rehabilitation teams continued to work at demonstration and training centres in Guatemala, India, Indonesia and Venezuela. New demonstration projects were initiated in Brazil and Uganda, in the latter case in the field of rehabilitation of the blind from rural areas. In these projects, 16 long-term experts were employed by the United Nations. Short-term training and advisory missions were undertaken by UN experts in Italy, Japan, Lebanon, the Philippines and Spain. Special equipment was provided to centres in Guatemala, Japan and Spain; and 15 fellowships and scholarships were granted for the training of technical personnel.

The International Society for the Welfare of Cripples also reported increased international voluntary activities in rehabilitation during the year. These consisted of increased numbers of international fellowships and distribution of films and literature. Many English-language rehabilitation publications were translated in Spanish and French and distributed for the first time.

(H. A. Rκ.)

Medicine. The focus of medical interest during 1956 was the tranquillizing drugs. Among the first tranquillizers to appear were Chlorpromazine and Reserpine, which have their chief value in the treatment of disturbed psychotic patients. Later came the ataractic drugs, which produce peace of mind and freedom from confusion. The most widely used during 1956 was Miltown or Meproamate, sold also under the name of Equanil. Others were Atarax, Frenquel, Pacatal and Promazine (also called Sparine). The mechanism by which these drugs have their effect had not been clearly established.

Frank M. Berger, who developed Miltown, classified the tranquillizers into two groups. One group includes those that affect the autonomic nervous system comprising the phenothiazine compounds such as Chlorpromazine, Promazine and Meprazine (Pacatal), Reserpine and the related alkaloids of *Rauwolfia* and the diphenylmethane compounds such as azocyclonol and hydroxyaine or Atarax. The second class comprises the central relaxants, which include Meproamate or Miltown and Mephene-sin. The central relaxants do not affect the autonomic functions. They do relax the spastic muscles and hyperexcitable multi-neuronal reflexes.

Oral Drugs for Diabetes.—In 1956 a startling announcement referred to the development of a preparation called BZ 55, later named carbutamide, which when taken orally reduced blood sugar. It was widely used in Germany, and extensive tests were made of it in British, Canadian and U.S. hospitals. Another antidiabetic sulfonamide, Orinase, was also studied. A simple solution as to the mechanism of action of these drugs had not been made available. German investigators believed that they act by damaging the alpha cells of the pancreatic tissue and stop the production of the hormone glucagon which raises the blood sugar. C. H. Best said that some insulin must be present for

the compounds to have a hypoglycemic action, and some investigators believed that in some way these drugs increase production of insulin. Still others suggested that these products potentiate insulin by action of enzymes in the liver.

Toward the end of 1956 the Eli Lilly company, which had the rights for BZ 55 for sale in the United States, withdrew the product because of reports of unfavourable reactions. Young patients did not respond well. The drug was certainly not a substitute for insulin. The incidence of side effects was not high, but fevers, rashes and occasional cases of jaundice occurred, and in isolated instances there were effects on the blood. In the controlled clinical studies made by the Lilly research laboratories, 5.3% of 8,000 patients suffered side effects, predominantly of the allergic type such as had been reported with sulfonamides in the past.

The product called Orinase, which is also an oral hypoglycemic agent, was further tested by the Upjohn company. Orinase is known scientifically as tolbutamide. Several hundred recognized authorities in the treatment of diabetes gave Orinase in the treatment of several thousand patients over varying periods of time. While not a substitute for insulin, Orinase appears to make unnecessary the use of insulin in the management of uncomplicated diabetes of mild or moderately severe degree. The product is not, however, indicated in juvenile diabetes nor in the life-threatening complications of diabetes such as coma, acidosis, high fever, injuries or surgery in which insulin is indispensable.

Heart Surgery.—Among the most amazing advances in medicine were the new steps taken in surgery of the heart. All the valves of the heart had now been operated on surgically. The latest refinements were those which permitted operations on the heart which had been drained free of blood and which, in fact, was without movement over varying periods of time. In some types of surgery of the heart, dryness of the heart is unnecessary. These operations are done while the heart is still beating and the blood travels through the heart and the lungs and around the body. In order to close a hole in the wall which separates the right and left lower chambers of the heart, however, the surgeon works best if the blood has been detoured from the heart into a device which keeps it circulating to the brain and other vital organs while the operation is being done. This device was invented by investigators at the University of Minnesota. The device is made of different sizes of plastic tubing. The blood is led from a vein of the patient, mixed with oxygen and the carbon dioxide released, and then pumped into the patient.

Deliberate stopping of the heart by a process called "controlled cardiac arrest" is also used in such procedures. The heart is allowed to beat long enough to empty itself, and then a drug is injected which brings it to a standstill. After the surgeon has finished the operation, the beating of the heart is started again by any one of several different methods. In many instances it will begin automatically when the new blood is put into the coronary blood vessels with a drug that acts as an antidote to the first drug. Other methods include massage of the heart muscle and the application of electric shock to the surface of the heart. Thirteen such operations were done in Cleveland on children who were born with major defects of the heart, and nine of these children survived.

A survey indicated that about 50 surgeons in the United States and perhaps 20 in other countries had operated on a total of about 1,200 patients who had inadequate circulation of blood through the coronary blood vessels, to relieve the pain of angina pectoris. Relief was secured in 80% to 90% of those operated on. The usual operation involves opening the chest; roughening the surface of the heart; dusting the area with asbestos powder to cause irritation, which is accompanied by increased blood flow; and protecting the area surrounding the heart by plastic pro-



MEDICAL EXPLANATION of President Eisenhower's intestinal operation given by Maj. Gen. Leonard D. Heaton, commandant of Walter Reed Army hospital, at a press conference on June 9, 1956

cedures. Out of 185 patients who had this operation at Mt. Sinai hospital in Cleveland, O., the operative death rate was less than 1%.

The American Society for Study of Arteriosclerosis (hardening of the arteries) had a report of a startling experiment for removing the rough lining of hardened arteries. These rough linings are largely responsible for stopping blood flow as occurs in coronary thrombosis. The surgery, which was still experimental, involved the use of a thin, hollow instrument, $\frac{1}{16}$ in. in diameter and 1 ft. long, which was introduced into the clogged artery from below the point of the clogging. The tube was then drawn back and twisted so that a nick in its side scraped the artery wall free of projecting material. The procedure was carried out on two men, aged 51 and 52. Much more experience was needed before the success of this process could be evaluated.

Parkinson's Disease.—An important step in the control of Parkinson's disease, or shaking palsy, was the development of operative procedures by Irving S. Cooper and his associates in New York. Several years earlier the first step, which was used in 50 cases over a period of 2½ years, was blocking of the anterior choroidal artery at the back of the neck. The newer procedure was the injection of a chemical substance into the area of the brain from which the tremors emanate. This area is in the region of the globus pallidus. In both operative procedures an arteriogram and a pneumoencephalogram are used to determine the point of origin of the anterior choroidal artery and its course before operation and destruction are accomplished. When the area is located, a polyethylene cannula is placed so that its tip lies in the region of the mesial globus pallidus. First procaine is injected. Usually this relieves immediately the tremor and rigidity on the opposite side. When this is reached, dehydrated alcohol is slowly injected over a 20- to 30-minute period. Then the wound is closed, but the cannula is left in place and two more injections of absolute alcohol are made during the ensuing week

to enlarge the lesion and ensure a lasting result. This operation was performed 50 times, with four serious complications resulting in two deaths, one case of paralysis of one side of the body and one case of ataxia. Over-all incidence of good lasting results was reported to be 65%.

Cancer.—Research on cancer included several approaches to the disease based on the concept that the growth of cells may be stopped by growth-inhibiting substances called cytostatic agents. Gerhard Domagk utilized a substance called E-39 (10^7 ethylene-imino-quinone) which proved in experiments on mice to have the ability to stop the growth of cancer cells. The substance was used on 72 human patients by Wolf and Gerlich. Other cytostatic agents include an antibiotic, Sanamycin, which is prepared from *Actinomyces* cultures.

Another group of investigators employed certain strains of the Coxsackie virus which apparently can attack cancer cells, and experiments were made with such drugs as colchicine, urethane, Aminopterin and various hormones and radioactive isotopes. For years it had been known that X-rays may be effective in stopping cancer growth when the tumours are susceptible to the X-rays.

The theory that pituitary gland hormones affect cancer growth was verified in combined research by O. H. Pearson of the Memorial Center for Cancer and Allied Diseases in New York city and Bronson Ray of New York Hospital-Cornell University Medical centre. They removed the pituitary glands of 43 women with far-advanced breast cancer. Of these, 20 showed positive improvement, 17 did not show improvement and 6 had been operated on too recently to permit evaluation. The longest remission had been 20 months. Eleven of these women had previously improved following removal first of the ovaries and later of the adrenal glands. The pituitary gland was removed from 26 other patients who had widespread cancer, including cancer of the prostate, the breast, the ovaries and the thyroid. In only two cases was there failure to respond—one with cancer of the prostate and the other a man with breast cancer. Five of 69 patients who had the pituitary glands removed died as a result of the surgery. From Sweden R. Luft and Herman Olivcrona reported the results obtained by this technique in 50 operations. Fifteen of the patients were reported alive from six months to three years; all had been considered fatal cases.

Pulseless Disease.—From China came reports of a condition called pulseless disease, also known as Takayashu's syndrome. The condition seemed chiefly to affect young women. Absence of pulse occurs in the arms and legs with intermittent disturbances related to the shortage of blood supply. Because of occasional diminished blood supply to the brain, impaired memory, emotional instability and occasional transient paralyses were observed. Attacks of fainting took place in about one-fourth of those affected. The investigators were inclined to relate this condition to collagen disorders.

(See also ALLERGY; BACTERIOLOGY; BIOCHEMISTRY; BIRTH CONTROL; BLOOD, DISEASES OF THE; CANCER; CHEMOTHERAPY; DENTISTRY; DERMATOLOGY; DIABETES; EAR, NOSE AND THROAT, DISEASES OF; ENDOCRINOLOGY; EPIDEMIOLOGY; EYE, DISEASES OF THE; HEARING; HEART AND CIRCULATORY DISEASES; HOSPITALS; INDUSTRIAL HEALTH; MEDICAL REHABILITATION OF THE DISABLED; NARCOTICS; NUTRITION, EXPERIMENTAL; PSYCHIATRY; PSYCHOSOMATIC MEDICINE; PUBLIC HEALTH ENGINEERING; RESPIRATORY DISEASES; RHEUMATIC DISEASES; STOMACH AND INTESTINES, DISEASES OF THE; SURGERY; TROPICAL DISEASES; VETERINARY MEDICINE; VITAMINS AND NUTRITION; X-RAY AND RADIOLOGY.)

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(May 1956); "Malignant Tumors and Cytostatic Agents," *Postgrad. Med.*, 20:574-576 (Nov. 1956). (M. Fl.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Alcoholism* (1952); *Allergies* (1952); *Antibiotics* (1952); *Atom and Medicine* (1952); *Cancer* (1953); *Defending the City's Health* (1941); *First Aid on the Spot*, 2nd ed. (1954); *Heart Disease—Its Major Causes* (1955); *Home Nursing* (1941); *Immunization*, 2nd ed. (1955); *Tuberculosis*, 3rd ed. (1956).

Television in Medicine.—During 1956 two of the largest medical television facilities in the United States, the Smith, Kline and French portable system and the Walter Reed Army Medical centre's fixed installation switched from field sequential to compatible colour.

The Smith, Kline and French unit is contained within a single van which can be parked conveniently near a selected programming site. The van houses master monitoring and switching facilities as well as rack-mounted equipment sufficient to permit two-camera operation. A busy schedule in support of regional and national medical meetings was begun in late September during the annual meeting of the Kansas City Southwest Clinical society.

The new Walter Reed Army Medical centre system utilizes eight-camera chains in television production facilities situated in the Walter Reed Army hospital, the Walter Reed Army Institute of Research and the Armed Forces Institute of Pathology. Complete programs can be originated separately and simultaneously or all units can be operated as a single system from a master control at the Armed Forces Institute of Pathology. The basic arrangement in each location consists of a control room, announcing booth and studio, as well as cabled remotes.

The hospital studio is used for clinical demonstrations, particularly those involving patients too ill to be moved to the more adequate facility at the Armed Forces Institute of Pathology. Live surgery sequences may be integrated into hospital programs by means of a remotely controlled camera mounted in the ceiling of a room in the operating suite which is also equipped with additional cables permitting simultaneous use of a regular studio camera.

The studio of the Walter Reed Army Institute of Research is designed primarily for the demonstration of research laboratory procedures and dental techniques. However, the building is also provided with installed cables to veterinary surgery and to a special dental demonstration unit. Simultaneous two-camera operation is possible at any of these locations.

The centre's largest television facility, situated at the Armed Forces Institute of Pathology, consists of a capacious general production studio, a video control room housing five camera controls, a master control for the entire system and a tele-cine area which houses a film camera chain and a monochrome kine-recorder. The building is also provided with numerous cabled remotes such as the autopsy suite's remotely controlled 3-V camera, similar in design to that used in the hospital surgery. Particularly noteworthy is the 3-V television microscopy unit, which is most often used in the surgical pathology laboratory, but may be easily moved to other cabled locations.

Television productions of the Walter Reed Army Medical centre are distributed over an antenaplex coaxial network on channels 2, 6 and 11 to 130 receiver and projector locations in classrooms, conference rooms and auditoriums. In addition, programs can be fed to and received from outside sources. The first off-post transmission from the system occurred on Dec. 6, 1956, and consisted of a two-hour presentation in advanced dentistry distributed by American Telephone and Telegraph to the 32nd annual Greater New York Dental meeting. (P. W. SR.)

Merchant Marine. The United States merchant marine on Sept. 1, 1956, totalled 3,179 ocean-going merchant vessels of 1,000 gross tons and over. Of the total number, 1,098 were active and 2,081 were either temporarily in-



CADETS IN TRAINING with radar equipment at the U.S. Merchant Marine academy, King's Point, N.Y., which in 1956 was given status equal to that of the army, navy and air force academies

active or laid up in the government's reserve fleets. Private steamship companies owned 1,043 of the active vessels; 55 ships owned by the government were also in service. Of the latter, private steamship companies were operating 24 under bareboat charter in their own services and 28 were being operated by lines acting as general agents for the Military Sea Transportation service. Three were operated by the Panama Canal Co.

The active fleet consisted of 724 freighters, 335 tankers and 39 passenger or combination passenger-cargo ships. The active fleet was 12 vessels less than the corresponding fleet a year before, with 7 less in the private fleet and 5 less in the government fleet. Thirty tankers, 11 freighters and 3 combination passenger-cargo ships were transferred to foreign flags from the private fleet, while the government sold 18 ships from its reserve fleets to Korea and Brazil; 5 ships were added by new construction.

Of the 1,098 active vessels, 308 were subsidized by the government to make up the difference between foreign and U.S. costs of operation. Sixteen companies owned 303 of these ships and chartered 5 others from the government.

In the 12 months preceding Sept. 1, 1956, U.S. shipyards built or converted 11 large ocean-going ships. At the end of the period there were 60 ships being built or converted, of which 45 were for private companies and 15 for government account. This was twice as many as on the same date of the preceding year. The new ships under construction were 4 new and 3 con-

erted combination passenger-cargo vessels, 6 new and 4 converted freighters, and 31 new and 12 converted tankers.

The ships under order for government account were for the most part for the Military Sea Transportation service, but there was a tanker of a new class, the "Pipeline" under order for the Maritime administration, and 4 Liberty ships from the reserve fleet were being repowered and otherwise modernized in an experimental project with a dual purpose—to determine the feasibility of upgrading the large number of war-built Liberty ships now in the reserve fleets to make them more useful in an emergency, and to try out new propulsion equipment and cargo handling gear for possible use by other merchant vessels.

Three of these converted Liberty ships had undergone their trial runs by the early part of Sept. 1956 with encouraging results. One vessel, the "Benjamin Chew," received a minimum conversion, her reciprocating steam engine being replaced by a steam turbine. Her 10-knot speed was increased to 15 knots. The "Thomas Nelson" received a new diesel engine, a new, sharper, longer bow, and new crane-type cargo handling gear. Her speed was increased to more than 17 knots. The "John Sergeant" became the first large merchant vessel to be powered solely by a gas turbine, and with this engine and a new bow she made more than 18 knots, almost double her former speed.

Of the private ships under construction, a number were being built with various types of government aid and encouragement. Twenty-eight new and converted tankers were being built as a consideration for permission to transfer older tankers to foreign flags. Three new tankers were being built with the aid of trade-in allowances granted by the government for older vessels. Six new passenger ships were being built with the aid of government construction subsidies, which made up the difference in cost between building in U.S. yards and in yards abroad. Payment for national defense features incorporated in vessels in excess of normal commercial needs and provision of government insurance or private loans obtained to assist ship construction were other aids given to encourage new building.

Applications for similar types of aid were pending for a number of other new vessels. It was expected that orders totalling \$500,000,000 would be placed with U.S. shipyards during the fiscal year ending June 30, 1957, to match the same value of work placed in the yards during the preceding year.

By Sept. 1, 1956, five shipping companies had signed long-range agreements to replace their fleets, providing for the construction of 92 ships in the next 20 years. Replacement obligations of all lines receiving operating differential subsidies totalled about 190 ships at an estimated cost of \$1,500,000,000 in the next 20 years. Together with construction planned by other lines, principally for tankers, and roll-on-roll-off or self-loading truck- and trailer-ships, it was expected that enough new ships would be ordered from U.S. shipyards each year to keep a nucleus of skilled workers regularly employed and available if needed in an emergency.

(See also SHIPBUILDING.)

(C. G. M.)

International.—For the international shipping industry the year 1956 was one of the most prosperous yet experienced. Despite the rapid expansion of tonnage which came into service, world demand for shipping space of practically every kind continued to increase, and the rise in the general level of freight rates which was a feature of 1955 continued persistently throughout 1956. The United Kingdom Chamber of Shipping indexes of tramp shipping freight rates (see Table I) give some indication of the steady rise in demand, which occurred against a background of continually increasing tonnage availability. The number of ships laid up through lack of employment throughout the world fell to negligible proportions; the number of ships scrapped through obsolescence, despite the increase in prices paid

Table I.—Tramp Shipping Freight Index, 1956
(1952=100)

Month	Voyage rates	Time charter rates	Month	Voyage rates	Time charter rates
January	144.3	138.0	July	155.2	167.1
February	140.2	148.2	August	157.9	176.6
March	147.2	150.0	September	156.1	174.2
April	151.6	171.5	October	153.6	191.8
May	162.2	190.0	November . . . . .	...	...
June	155.5	169.4	December . . . . .	...	...

Source: Chamber of Shipping of the United Kingdom.

for scrap, was reduced to the minimum and the prices of second-hand ships reached levels similar to those attained during the Korean war, even for ships which by 1956 were four years older. Liner conference tariff rates again were increased on practically every trade route, by proportions varying from 5% to 15%. In many cases these increases followed similar increases in the previous year. Operating costs also continued to rise. Wage rates paid to British merchant navy officers and crews advanced by an average of about 7½%, and this standard was followed, as was usual, by the principal maritime nations. The price of oil bunkers again increased throughout the world by an average of 7½% to 10%.

The major disturbance of the year was caused by the nationalization of the Suez canal in July by the Egyptian government. The International Chamber of Shipping immediately registered a protest against the declared purpose of the Egyptian government to exploit the canal by appropriating revenues collected from international commerce for financing internal projects, and expressed the view that the canal should be maintained as an independent international waterway. The complete blocking of the canal at the beginning of November made it necessary for all ships to be diverted via the Cape of Good Hope, thus disrupting normal sailing schedules and causing an artificial shortage of tonnage, which was accentuated by the requisitioning of about 80 dry-cargo liners and tramps for military purposes by the British and French governments. By the beginning of December most freight rates had reached record levels.

Table II.—Merchant Fleets of the World, June 30, 1956
(Each of 1,000 gross tons or more)

Country	No. of vessels	Gross tons (in 000s)	Country	No. of vessels	Gross tons (in 000s)
British Commonwealth of Nations	3,068	20,006	Spain	297	1,137
United States*	1,266†	10,552†	Argentina	146	901
Norway	1,130	7,559	Brazil	188	733
Liberia	570	5,614	Finland	228	701
Italy	616	3,933	Turkey	139	534
Panamá	510	3,871	Costa Rica	126	514
France	568	3,685	Belgium	75	483
Netherlands	546	3,542	China	141	422
Japan	626	3,519	Portugal	86	419
Germany	708	2,728	Honduras	55	342
Sweden	578	2,696	Poland	69	297
U.S.S.R.	622	1,886	Yugoslavia	62	250
Denmark	307	1,533	Chile	54	218
Greece	215	1,265	Other countries	378	1,495
			Total	13,374	80,835

*Excludes vessels operating on Great Lakes. †Excludes 1,972 inactive vessels of 14,220,000 gross tons in Maritime Administration Reserve Fleets.
Source: Shipbuilders Council of America.

The phenomenal growth of merchant fleets registered under the flags of such nonmaritime countries as Liberia and Panamá began to cause alarm in the traditionally maritime countries. By mid-1956 the active fleets registered under these two flags combined were exceeded only by those of Great Britain and the United States. The ownership of such vessels, under what came to be known as "flags of convenience," was vested mainly in U.S. and Greek companies and citizens of other nationalities. Owners of ships registered in such countries were able to avoid the high rates of taxation applicable in most of the traditional maritime countries, or, in the case of U.S. companies, the handicaps of U.S. shipping legislation. During 1956, for the first time, a significant move among British shipowners was made to transfer their operations to "tax-free" parts of the Commonwealth such as Bermuda, in an endeavour to place themselves on an

economically competitive basis with ships registered in Liberia and Panamá. (P. DF.)

Mercury: see MINERAL AND METAL PRODUCTION AND PRICES.

Metallurgy. To strengthen the U.S. economy and to conserve national mineral resources to the best advantage, the U.S. government and industry made numerous studies and experiments. The outstanding advances in metallurgy in 1956, in the United States and elsewhere, follow.

Alloys.—Research was completed which resulted in the development of a wider range of magnesium-lithium-aluminum alloys with improved physical properties. Basic information provided by the U.S. bureau of mines contributed greatly to development of techniques for using these lightest and most ductile of magnesium alloys in fabricated parts of aircraft and missiles.

Aluminum.—The possible use of a lime-soda sintering method to recover alumina from aluminum plant residues and from high-silica bauxites was demonstrated by laboratory tests.

Anthracite.—The anthracite experiment station at Schuylkill Haven, Pa., planned to install new equipment for treating lump and briquetted anthracite in efforts to improve its usefulness as a metallurgical fuel.

Chromite.—Studies of chromites of argon showed that these ores can be smelted to yield ferrochrome-silicon and that they are suitable for refractories. The work was done in co-operation with the school of mineral engineering of the University of Washington, Seattle.

Coke.—The yield and quality of coke from 41 U.S. coals and 33 coal blends were determined by the U.S. bureau of mines. Anthracite was used experimentally and with encouraging results as a partial substitute for coke in iron production.

Copper.—A copper manganese alloy with superior vibration-damping qualities was developed. This had many important applications, from delicate instruments to large machines, where it was necessary or desirable to minimize noise and vibration.

Electrostatic Separation.—Temperature tables for 97 min-

erals were compiled by the bureau of mines and published in a technical report in May 1956. The information supplied by the tests was expected to find practical use at plants treating beach sands and rare earth ores, and might extend the use of electrostatic separation to other minerals now considered untreatable by this process. The methods and equipment used in the test were described. It was believed that the report might be an indicator of other minerals that might be recovered by the process, and also the most favourable temperature for treating them.

Electrodes.—Electrodes that are consumable, and production techniques in melting easily contaminated metals such as titanium and zirconium, were reported by the U.S. bureau of mines in Aug. 1956. Methods of producing the electrodes differ according to types of material. Five electrode-production techniques include: pressuring sponge metal or crushed chips of metal into briquettes; electrical sintering of short stacks of briquettes formed under low pressure; joining briquettes by spot or strip welding; assembling electrodes quickly from massive scrap by welding; and joining ingots made in a small furnace to produce a consumable electrode for a larger furnace.

Ferromanganese.—Ferromanganese of a standard grade was made from Artillery Peak (Ariz.) ore by concentration sintering and electric furnace smelting. This was part of the U.S. bureau of mines' long-range effort to reduce the country's dependence on foreign sources for this essential ingredient of steel.

Fluorspar.—Fluorspar deposits were examined, new methods of beneficiating fluorspar ores were under development and laboratory work on recovering fluorine from waste gases at phosphate-rock processing plants was undertaken.

Iron Ore and Steel.—The Eagle Mountain open-pit iron mine in California had been developed so that by 1956 it was yielding 2,250,000 tons of ore a year. It required much study and planning before this lower-grade ore could be utilized commercially. The limonitic brown ores of Texas were found to be usable after grinding and magnetic separation recovered more than 80% of the iron in concentrates. The area had estimated reserves of approximately 140,000,000 tons of commercial grade ore.

In western Canada the only basic steel producer installed in its Vancouver (B.C.) mill a process for heating steel ingots by electrical induction. The heating time for ingots was reduced 75%, which increased production by 30% and lowered fuel costs about \$1 a ton. An official stated that the mill could now compete with Japan, where labour costs were about one-fifth of those in Vancouver.

Lepidolite.—Lepidolite concentrates, tests showed, can be prepared by a combination of roll crushing, screening and flotation from the Brown Derby pegmatite deposits of Colorado.

Tantalum-Columbium.—A new method of separation by solvent extraction was developed by the U.S. bureau of mines and reported in Aug. 1956. This separation of the tantalum and columbium from ores can produce both tantalum and columbium oxide at greater than 99% purity and appeared to be satisfactory for industrial application.

Titanium.—In producing titanium in inert atmospheres, experiments resulted in the development of a successful technique for using argon instead of helium in the reduction step of the magnesium-reduction process for producing titanium sponge.

Zinc.—A new process was devised for salvaging 99.99% pure zinc from zinc-bearing wastes of the galvanizing industry.

(See also CHEMISTRY.)

(F. E. H.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Copper—Mining and Smelting* (1950).

Metal Prices and Production: see MINERAL AND METAL PRODUCTION AND PRICES.



"PING-PONG" VIBRATION TEST of cobalt-nickel alloy developed by Westinghouse Electric Corp. and demonstrated in 1956. Steel tuning fork on the left vibrates as the ball hits it, while the alloy fork on the right—magnetized by its atomic structure—is still. The new metal was to be used principally for high-temperature steam turbine blades, increasing the efficiency of electric power plants

Meteorology. In the laboratory as well as in the atmosphere meteorologists sought during 1956 to analyze the complex flow of the atmosphere with the many different forms of waves, eddies and vortexes, large and small, and the associated interactions of air masses and air parcels at different temperatures and humidities. These are the phenomena that produce the endless changes in weather from day to day and determine the average or "prevailing" conditions called climate. If these processes of the atmosphere could be reproduced in the laboratory where the unknowns could be identified and studied one by one, progress in meteorology would be greatly facilitated. Moreover, the impossibility so far of obtaining data representative of the atmosphere and its variables throughout its vast expanse and depth over the globe to enable researchers to study the phenomena quantitatively had greatly impeded progress in meteorology.

Cloud Physics.—A conference was held at the Institute of Atmospheric Physics in Tucson, Ariz., during April 10–12, 1956. With leading researchers in this field from Australia, Canada, England, France and other countries of western Europe, Japan and the United States in attendance, this conference examined thoroughly the existing knowledge of the scientific basis for weather modification and "artificial rain making." It brought into perspective the principles involved in the processes of condensation and precipitation as they occur in clouds and led to some clarification of the status and limitations of cloud seeding as a means of inducing rain or snow.

Among the many other research studies in cloud physics carried on during the year in Australia, Europe and North America were those by the meteorological department of The University of Chicago, by the Geophysical Research directorate of the U.S. Air Force and by the physical research division of the U.S. Weather bureau. Working with artificial cloud chambers in the laboratory, one of these an enormous gas storage sphere near Waco, Tex., in which the behaviour of cloud droplets could be observed under conditions approximating those of the free atmosphere, and also at mountain observatories, the research efforts of these institutions made real progress toward bringing a better understanding of the mechanism of precipitation as it occurs in nature. Among the noteworthy research papers were those on laboratory measurements of the growth and collection efficiency of raindrops, a subject of basic importance in the formation of rain by coalescence of drops in warm, shower-type clouds, and on the hyperelectrification of raindrops by atmospheric electric fields. Other papers by the physical research division, which had accomplished a remarkable number of fundamental measurements and conclusions, dealt with drop size distribution, terminal velocities of falling drops and other constants vital to computations in cloud physics. An investigation by the Smithsonian Astrophysical and the Harvard College observatories into meteors and rainfall brought evidence contrary to an earlier conclusion by an Australian physicist that periodic incidence of cosmic dust caused the observed singularities in rainfall. Although the question was still under debate, the consensus appeared to be that meteoric debris is not a major source of nuclei for condensation of moisture in the atmosphere.

Solar-Weather Relationships.—Another conference directed toward fundamental factors in weather and climate was the six-week seminar during June and July at the High Altitude observatory of the University of Colorado, Boulder. This seminar brought together astronomers and meteorologists with special competence in solar-weather relationships for the purpose of examining systematically the complex effects of the radiant energy received from the sun as it heats the earth's surface and the atmosphere at various levels, and in different ways influences the general circulation of the atmosphere. Return to intensive

study of solar energy as the initial force in shaping weather and climate, a subject more or less neglected since synoptic and dynamic meteorology came to claim the time and attention of most meteorologists, was characteristic of the increasing awareness of the many pressing meteorological problems in agriculture, aeronautics, national defense and other major activities, and the need to get down to fundamentals in seeking solutions. In other parts of the world, also, astronomers, geologists, meteorologists and physicists were re-examining the spectrum of solar energy and its effects on the earth's atmosphere in the light of modern nuclear theory and recent observations of radiation and heat transfer phenomena.

Prominent among the hundreds of other subjects of weather research reported during 1956 through the bulletins and journals of the American Meteorological society, the Royal Meteorological society (London) and in the summaries and other technical periodicals from the increasingly numerous technical meetings and seminars, national and local, were numerical weather prediction, radar meteorology and the causes and behaviour of severe storms. The general circulation of the atmosphere and its problems in hydrodynamics, including the theory of the jet stream, were also treated in numerous technical papers.

Other Developments in Meteorology.—For obtaining much needed basic observations representative of significant conditions in different parts of the atmosphere all over the globe, new methods of sounding were being developed. The transisonde, a long-distance balloon carrying a radio telemetering device to give temperatures, humidities and winds, established new records in tests over the Pacific. One transisonde launched in Japan was carried by the westerlies at altitudes of many thousands of feet clear across the Pacific, North America and the North Atlantic until it finally landed in western Europe. New high-altitude records in collecting atmospheric data were attained almost monthly in the tests of several types of rockets and guided missiles. In December the initial experimental firing of a first-stage prototype of the three-stage rocket vehicles, designed to send a 20-in. satellite into its orbit 300 mi. above the earth during the 1957–58 International Geophysical year, reached an altitude of about 125 mi. and gave high promise of new and important atmospheric data to come.

On Sept. 7 a new altitude record for obtaining high-level data by free balloon was established when a plastic bag 180 ft. long rose to a level slightly above 142,000 ft. It was inflated with helium and carried almost 50 lb. of recording equipment and control devices.

Great networks of weather observing stations were planned for the meteorological program in the International Geophysical year. The program provided for six radiosonde stations in Argentina, five in Brazil, four in Chile, two in Peru and three in Venezuela to give upper air data from South American areas which had in the past shown serious gaps in observations of the general circulation and its effects on weather elsewhere, not only in the southern hemisphere but also in the northern. These stations were part of the world-wide system of meteorological stations to be augmented for the special studies in the geophysical sciences during the International Geophysical year. In order to study the causes and characteristics of exchange of air masses between tropical and polar regions and the evolution of zonal flow with its occasional jet streams at very high speeds, the observational networks would provide for five chains of stations along well-spaced meridians, three of these chains extending from north polar to south polar regions. These three were along the meridians 10° E., 140° E. and 80° W. For this purpose it was planned to establish also approximately 60 new meteorological stations in the antarctic which would enable meteorologists for the first time to chart the weather and analyze the outflow

of air from the earth's largest source of cold air.

Through use of larger radiosonde balloons, daily ascents up to 30 km. (about 100,000 ft.) were expected at more than 75 well-distributed stations throughout the western hemisphere. Plans called for similar soundings at stations in other parts of the world operated by one or another of the nearly 50 co-operating countries participating in the International Geophysical year.

The observations in polar regions would include measurements of direct and diffuse solar radiation, net heat flux near the ground and atmospheric ozone, in addition to the regular standard meteorological observations, surface and upper air. At the seven U.S. weather stations in the antarctic there would also be measurements of carbon dioxide and other geochemical components of significance in testing recent theories pertaining to the role of these elements or compounds in inducing changes in climate and possibly in evolution of ice ages. (See also INTERNATIONAL GEOPHYSICAL YEAR, 1957-58.)

Numerical Weather Prediction.—The more comprehensive synoptic weather observations, surface and upper air, anticipated in the International Geophysical year program were urgently needed for further development of the newest and most sanguine phase of modern meteorology, namely the analysis of the general circulation and the forecasting of weather by numerical treatment based on use of the electronic computer. This technique, which had come to the front in meteorological news and popular interest since 1954, was seen likely to bring revolutionary procedures in weather forecasting techniques during the next five to ten years.

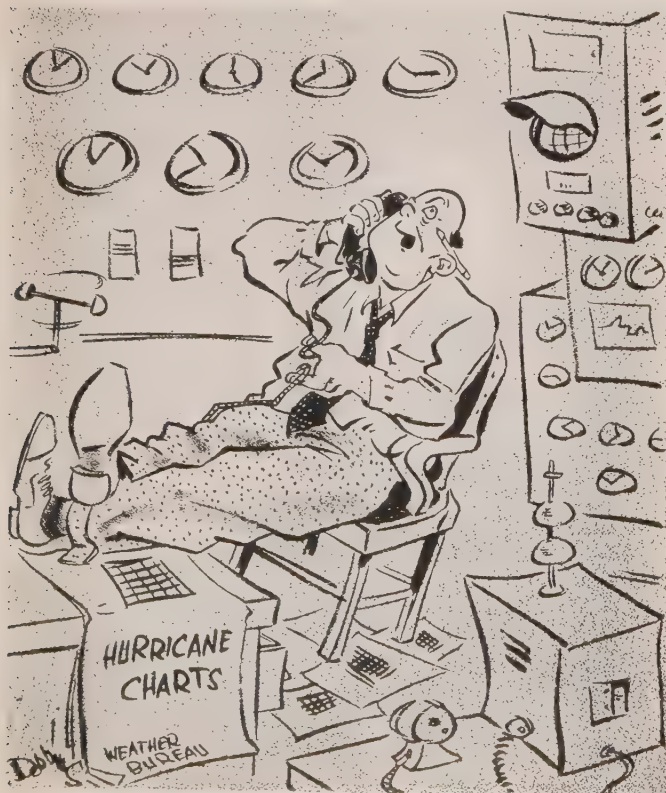
Perhaps the most significant work brought out in this branch of the science during 1956 was published in the quarterly journal of the Royal Meteorological society in April. It reported that patterns similar to those of the general circulation of the earth's atmosphere had been for the first time derived mathematically. This experiment demonstrated that the electronic computer could be made to serve in a sense as the "wind tunnel"

long needed by meteorologists for testing hypotheses about the general features of the major wind systems of the globe. The experiment assumed initially an atmosphere at rest. Terms representing latitudinal temperature differences were then introduced together with certain other factors. Although the two-level mathematical model greatly oversimplified the process compared with its mechanism in the free air, it eventually evolved flow patterns similar to those in the general circulation with typical features such as a jet stream and perturbations suggestive of the cyclones in the secondary circulation. This experiment was another confirmation of the part played by cyclonic systems as a driving force in zonal flow. In another experiment based on mathematical treatment it was confirmed that convectional instability, heat of condensation and other factors now neglected because of the complexities in their treatment must be included in the equations if vertical motions and their influence on formation of clouds and rain were to be derived. These two experiments during 1956, each involving many weeks of study and computer model design, were indicative of the future progress to be made by this new technique.

Throughout 1956 numerical weather prediction was used daily by the U.S. weather bureau to produce prognostic charts for guidance of weather forecasters in most parts of North America.

Weather Modification.—Possibly a most important future use of numerical weather prediction was seen in the first tentative computations or estimates of the consequences of large-scale weather modification. In recent years the many claims and promises that had been publicized of plans to regulate all outdoors to suit the desires of man had appealed to popular fancy and many people had come to believe that "weather control" would soon be a practical accomplishment. Few had paused to inquire about the natural consequences of large-scale modification of present weather regimes. In fact, meteorologists could not with assurance foretell, for example, what would eventually evolve from an artificial warming of polar regions designed to reduce the rigours of wind in mid-latitudes and open up the polar lands to easier habitation, cultivation and development. Some of the fairly immediate results were easy to conjecture. If most of the ice covering the arctic regions and Greenland were warmed and melted either by direct artificial heating (atomic energy) or by dusting over vast areas with particles that would have a greenhouse effect on radiation from the sun and lead to general warming of the arctic, one result would be to add water to the oceans and raise sea level everywhere several feet. This would have its effects on port installations all over the world. Moreover, regions like southern California and the Mediterranean that receive much of their water supply from winter rains accompanying the cold fronts of polar air masses which move southward as high-pressure systems would find this source of water much curtailed as a consequence of the reduced temperature contrasts between the tropics and the arctic. Some meteorologists theorized that a warming of polar regions would so modify the general circulation and the water content of the atmosphere that the imbalance would set in motion forces which would eventually make the region colder and could bring on another ice age.

As regards artificial rain making, hailstorm suppression, fog dispersal at airports and other aspects of local weather control, many claims were made during 1956 as in previous years since 1947 when cloud seeding came to be exploited, but conclusive evidence of practical results was still lacking. Cloud seeding appeared to be ineffective in increasing rainfall by significant amounts except under the relatively infrequent conditions of an abundant supply of supercooled clouds in upslope winds which constantly replenished the supply of droplets and in these circumstances rain usually would follow from natural causes without artificial seeding.



"AUNT SUE? HOW'RE YOUR CORNS?" a 1956 cartoon by Dobbins of the *Boston Post* (Mass.)



TORNADO approaching Grand Rapids, Mich., April 3, 1956

The Tucson conference in April had reviewed the exhaustive statistical treatment of results under these special upslope wind conditions. Although the evidence was questioned by some, the statistics seemed to indicate that seeding by silver iodide from ground generators had increased rainfall under these limiting conditions by amounts of 10% or 12% on the average, and perhaps by almost twice this amount in rare cases. There was no evidence to show that this method would be of any value in inducing rain in warm clouds or over flatlands. Thus it was excluded as a practical means for increasing rainfall in the great majority of localities suffering from water shortages. An Australian experimenter reported that he had induced rain to fall from warm cumulus clouds by seeding with water drops discharged in great quantities from aircraft, but the results as rain on the ground where it was needed were inconsequential and the method was relatively costly. Meteorologists in general appeared to believe that cloud seeding offered no hope for relief of water shortages in drought-stricken regions.

Experiments in hailstorm suppression and fog dispersal by artificial means were still being made but results so far did not appear to be economically worth while.

Investigations during the previous year of atomic bomb explosions in relation to weather anomalies had discovered no evidence that A-bombs or H-bombs had increased the number of severe storms or influenced the weather in any large-scale manner as suspected by many people. Nothing found in these studies during 1956 gave any reason to believe that bombs so far exploded anywhere in the world had caused permanent or large-scale changes in weather. With a view to the physiological effects of radioactive debris to be expected in event of hostile bomb attacks, the weather bureau in co-operation with the Federal Civil Defense agency inaugurated regular daily predictions of fallout sectors as determined by the current upper winds in proximity to principal cities.

Droughts, Floods, Hurricanes and Tornadoes.—In total economic losses from various kinds of unfavourable weather and destructive storms, the continuing drought probably exceeded all other bad weather damage in the United States during 1956. Except for spring floods in the Columbia and Sacramento river valleys and a few adjacent streams, the cases of flooding and the flood damage in the United States during the year were below the annual average. Hurricanes were somewhat below the annual average in number and were much below average in intensity and damage except for great destruction in Puerto Rico from Hurri-

cane "Betsy," as shown in Table II. Most of the hurricanes remained at sea, thus doing less damage. Tornadoes, principally during the spring months, caused numerous deaths and destroyed millions of dollars worth of property but their number, severity and destructiveness were not exceptional compared with annual averages. Blizzards and hailstorms also were within the normal limits of annual occurrences in the U.S.

At the close of the year the drought in many of the southwestern states had reached such disastrous proportions that the president of the U.S. planned an inspection tour of the stricken farmlands early in Jan. 1957. The drought's serious effects came not only from below average rainfall during 1956 but also from the many successive years of subnormal precipitation. The water reservoirs for many towns and cities were dangerously low, and river navigation in some stretches of the principal rivers was about to be suspended because of the shallow waters.

New Mexico and western Texas were among the driest states. At Albuquerque, N.M., rainfall had been below normal for the past 11 years and the first eight months of 1956 brought only 52% of normal rainfall for that period. The longest previous record of successive years with below normal precipitation in that locality during the past century was the four-year period 1922-25. At Roswell, N.M., the rainfall had been below normal since 1951 and during the first eight months of 1956 was only 37% of normal. The average annual rainfall for Roswell from 1878 to 1902 was 17.5 in. but from 1902 to 1955 it was slightly less than 12 in. per year. At Fort Bayard, N.M., there had been an average deficiency in rainfall of more than 4 in. per year for the past 12 years with the total amount during that period averaging only 11.3 in. per year. At Santa Fe, N.M., the rainfall during the five-year period 1951-56 averaged 4.2 in. per year below normal. Previous drought periods, none with several year deficiencies as great as this, were 1857-63, with 3.95 in. below the normal, and 1866-73, with 3.8 in. below. At El Paso, Tex., the 1950-56 deficiency averaged 1.4 in. per year compared with a slightly larger average annual deficit of 2.2 in. during the four-year period 1891-94. In studying alternate dry and wet spells it is to be noted that El Paso had four years of wet weather from 1880 to 1884, with average annual precipitation of 14.6 in., followed immediately by a ten-year dry period with average just slightly more than 7 in. per year.

Based on the known past shifts in rainfall patterns some meteorologists saw reason to think that the present long dry spell

Table I.—Some of the Tornadoes and Severe Local Storms in U.S., 1956

Place	Type of storm	Dates	Destructive path	Casualties (persons)	Property damage
Texas	Snow, strong winds	Feb. 1-6	Widespread in northern and central Tex.	20 deaths	More than \$1,000,000
Aberdeen, Miss.	Tornado, hail	Feb. 16	1¼ mi. long, 100-300 yd. wide	1 death, 55 injured	\$500,000 to \$1,500,000
Northern Calif. and Oregon.	Heavy rain and snow, wind	Feb. 19-22	Widespread in northern Calif. and southern Ore.	Few	\$500,000 to \$1,000,000
St. Clair and Clinton counties, Ill.	Tornado, hail	Feb. 25	40 mi. long, 200-500 yd. wide	6 deaths, 20 seriously injured	\$1,500,000 or more
Marion, Ind.	Tornado, hail	March 6	3 to 4 mi. long, 50 yd. wide	1 death, 30 injured	\$1,000,000 to \$2,000,000
New England	Freezing rain, "ice storm," strong winds	March 8	Boston and many other parts of New England	1 death, 20 injured	No estimate (not heavy)
McClain, Creek counties, etc., Okla.	Tornado, heavy rain	April 2	55 mi. long, 300 yd. wide	5 deaths, 100 injured	About \$1,000,000
Cowley Co. and north-eastward through Elk, Coffey counties, etc., Kan.	Tornado, hail, heavy rain	April 2	75 mi. long, 900 yd. wide, average	2 deaths, about 30 injured	More than \$1,500,000
Berlin, Wis.	Tornado	April 3	Varied	7 deaths, 50 injured	\$500,000 or more
Allegan, Kent counties, Mich.	Tornado, hail	April 3	65 mi. long, 300 yd. wide, average	18 deaths, 300-400 injured	\$5,000,000 to \$10,000,000
Henderson Co., Tenn.	Tornado	April 3	20 mi. or more long, variable width	3 deaths, 6 injured	About \$1,000,000
Flint, Mich.	Tornado	May 12	Several miles long, variable width, few hundred yards	6 deaths, more than 100 injured	About \$4,000,000

in the southwest would give way to a wetter period within the next year or two. Sometimes droughts are temporarily relieved by rains from great quantities of moisture carried into the air by tropical cyclones (hurricanes) and subsequently transported northward by winds with the trough of an extratropical cyclone. This occurred in 1952 in portions of Arizona, and again in 1956 when the first small tropical cyclone of the year came from the Gulf of Mexico and passed over the lower Mississippi valley, bringing several inches of rain to dry southern states. See Table III for other data on droughts.

Some Special Features of the Weather During 1956.—

During the first week in January a record-breaking gradient of atmospheric pressure developed over New England, the Canadian maritime provinces and the western North Atlantic. A low that remained almost stationary for several days deepened to a centre reading 29 in. or lower while to the north a very cold polar air mass built up to a central pressure of slightly more than 31 in., the highest ever recorded for that part of eastern Canada. The frontal systems between these air masses brought to the New England and Canadian coastal areas a succession of snow, sleet and freezing rain. Eventually the winds carried colder air into the southern states and warmer maritime air into New England so that the north-south temperature distribution was reversed. In some places in the northeast temperatures were 20° above normal, and in the south, 15° below normal for that season, making the winter weather for a few days actually warmer in the northeast than it was in the southeast. On Jan. 31 a minimum temperature of -70° F. was reported from Verkhoyansk, eastern Siberia, the place long noted as the coldest on record in the northern hemisphere.

During February western Europe had the most severe winter weather in many years. Arctic air was carried southward and westward from the U.S.S.R. and Siberia by the winds of a huge anticyclone over northern Europe and by cyclonic circulation over southern Europe and the Mediterranean. In Austria temperatures were 20° below normal, and in Spain, 10° below normal. Heavy snows occurred in central Europe, Italy and southern France. Millions of olive trees along the Mediterranean were destroyed by freezing. Rivers were frozen for long distances and ice jams had to be freed by explosives. A low temperature of

5° F. was reported in Sicily on Feb. 9. Avalanches from the heavy snows and later thawing in Austria and Yugoslavia caused many deaths. In Australia, near Sydney, the worst floods in the recorded history of that region occurred during February. Twenty inches of rain fell in one night near a village on the Queensland border.

During March 19 heavy snows and blizzard conditions struck most of the northeastern U.S. with 18 to 20 in. of snow recorded in New York city. Winter returned to Europe in April when heavy snow fell in many districts all the way from Denmark to Italy. Florence, It., had its lowest April temperature (3.5° F.) since 1813. Destructive spring tornadoes occurred in the U.S. as shown in Table I. On July 4, Elizabeth, Colo., had a heavy hail storm that piled in drifts four feet deep in some places.

During August unseasonable snow in the Alps necessitated closing of the St. Gothard pass for the first time in 60 years during midsummer. A low temperature of 19° F. was reported in Munich on Aug. 30.

In September Hurricane "Flossy" developed off the coast of Mexico, crossed the Yucatán peninsula and the Gulf of Mexico and reached northwest Florida on Sept. 24. Although it caused many millions of dollars damage to crops and property, it brought about 50,000,000,000 tons of rain to parts of Florida, Alabama and Georgia, enough to replenish dry farmlands and depleted reservoirs.

During Nov. 19 to 22, 1956, heavy snowstorms brought early winter tie-ups in traffic to many parts of the plains states, the Great Lakes region and upper New York state. Snowfall was exceptionally deep in the vicinities of Erie, Pa., and Adams,

Table II.—Hurricanes, 1956

No.	Name	Dates	Places of greatest damage	Remarks
I	Anna	July 25-26	Tampico, Mex.; streets flooded, many houses destroyed	A short-lived storm. Formed in Gulf of Campeche and attained hurricane force for only few hours
II	Betsy	Aug. 9-19	Puerto Rico; many millions of dollars damage, several persons killed. Heavy damage also in Guadeloupe I.	Wind gusts reached 115 m.p.h. Storm first located 1,200 mi. E.S.E. of Puerto Rico. It crossed this island, then curved northeastward and remained at sea
III	Carla	Sept. 5-11	No damage reported on land and damage to shipping at sea was not great	A tropical cyclone but did not reach true hurricane intensity. Formed just north of eastern end of Cuba and moved northeastward at sea
IV	Dora	Sept. 10-12	Vicinity Tuxpan, Mex.; 27 persons killed, extent of damage still unavailable. Did not reach hurricane intensity	Formed in Gulf of Campeche, moved westward into Mexico and dissipated over land
V	Ethel	Sept. 11-13	Remained at sea and damage, if any, was slight	Formed 250 mi. E.S.E. of Miami, Fla., moved northeastward over ocean
VI	Flossy	Sept. 21-29	Northwestern Florida, Georgia and South Carolina; many millions of dollars damage to crops and property, 15 deaths due directly or indirectly to storm	Formed off coast of British Honduras, crossed Yucatán, then turned northeastward and reached Florida-Louisiana coast Sept. 24, then across states and to sea at Cape Hatteras on Sept. 27
VII	Greta	Oct. 30-Nov. 6	Rough seas and high swells on coasts of Dominican Republic, Puerto Rico and Leeward I.; estimated \$2,000,000 damage, 1 death	Formed between Haiti and Jamaica, looped in its path north of Puerto Rico, then moved northeastward to sea

Table III.—Drought Years in Southwestern United States:

The Ten Driest Years in Selected Areas

	Northwest New Mexico Year	New Mexico Rainfall, inches*	Northeast New Mexico Year	New Mexico Rainfall, inches*	Western Texas Year	Rainfall, inches*
Driest	1917	3.29	1936	5.54	1891	2.22
2nd driest . .	1860	3.78	1933	7.15	1934	2.73
3rd driest . .	1861	3.81	1934	7.24	1910	4.03
4th driest . .	1922	4.09	1935	9.53	1894	4.24
5th driest . .	1950	4.10	1910	10.15	1922	4.30
6th driest . .	1856	4.14	1953	10.43	1909	4.33
7th driest . .	1909	4.42	1920	10.45	1953	4.42
8th driest . .	1954	4.51	1946	10.50	1892	5.32
9th driest . .	1850	4.92	1922	10.75	1935	5.65
10th driest . .	1902	4.94	1924	10.81	1948	5.70
"Normal" . .		8.40†		15.79‡		8.56§

*Total rainfall measured by rain gauge at representative station during the entire year shown. †Based on records extending over 40 yr. ‡Based on records extending over 31 yr. §Based on records extending over 40 yr.

arthage and Copenhagen, N.Y., where amounts ranging from 20 to 40 in. in 36 hours piled drifts up to 7 or 8 ft. high and paralyzed all traffic for a day or more. The meteorological conditions leading to these heavy snow showers were of more than usual interest. Unseasonably cold air from Canada had moved southward across the relatively warm waters of the Great Lakes. This provided the additional moisture and the thermal instability to build up huge cumulo-nimbus clouds and snow showers which were channelled into rather narrow lanes southeast of the lakes by the persistent northwest winds. Localities outside these lanes had much less snow, thus giving large differences in snowfall within distances of a few miles and posing a difficult problem to the forecaster. In December normal seasonal weather returned to most of North America.

(See also DISASTERS; FLOODS AND FLOOD CONTROL.)

(F. W. RR.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Atmosphere and Its Circulation* (1945); *Distributing Heat Energy* (1938); *The Weather* (1941).

Methodist Church. The general conference, the delegated law- and policy-making body of the Methodist Church, was held in Minneapolis, Minn., April 25-May 7, 1956. The 766 delegates, divided equally between ministers and laymen, listened to their bishops' formal message read by Bishop Fred Pierce Corson of Philadelphia, Pa., then divided into legislative committees among which were distributed for study and action a record number (4,986) of memorials, petitioning for changes in policy and organizational changes.

Important actions taken by the general conference accomplished the following: granted full clergy rights to women; changed the 130-year-old official weekly, *Christian Advocate*, to a professional monthly for ministers, to be known as the *New Christian Advocate*; launched a "popular" monthly magazine called *Together*, slanted toward the laity; terminated five "house organs" previously published by church boards and authorized a new periodical, the *Methodist Story*, to combine their functions and to serve general cultivation and promotional purposes; declared "there must be no place in the Methodist Church for discrimination or enforced segregation"; created a 70-member commission to conduct a four-year study of racial segregation and of the church's jurisdictional structure; adopted a twofold emphasis for 1956-60, to improve the organization and general effectiveness of the local church, and to raise \$37,000,000 for the financial support of Methodist schools and colleges; authorized two new theological seminaries, one in Ohio, one probably

Kansas City; appropriated \$1,000,000 to establish on the campus of American university, Washington, D.C., a school for foreign service; endorsed planned parenthood; and provided for 60 new bishops to be elected by overseas central conferences. The ninth World Methodist conference brought 2,500 delegates and official visitors from 40 countries to Lake Junaluska, N.C., Sept. 1-12, 1956. Begun in 1881 and meeting decennially through 1951 (Oxford, Eng.), the 1956 session was the first gathering of representatives of the world's independent Methodist bodies to meet on the new quinquennial schedule.

The 1956 conference was on the theme "Methodism in the Contemporary World." Sixty-five addresses were delivered.

The World Federation of Methodist Women met Aug. 27-31, 1956, also at Lake Junaluska. Previously independent, the federation voted to become a part of the World Methodist council.

The Methodist Church had in 1956 a membership of 9,313,278, not including 1,187,805 preparatory members; 39,854 preaching places; raised \$56,774,061 for benevolences, raised \$384,490,613 for all purposes.

Official totals announced by the secretaries of the World Methodist council for the 27 Methodist bodies comprising that

organization were: members, 18,000,000; constituency, 40,000,000.

(See also CHURCH MEMBERSHIP.)

(R. SY.)

Mexico. A federal republic of Middle America lying between the United States on the north and Guatemala and British Honduras on the south, Mexico has an area of 760,373 sq.mi. Population (est., 1955) 29,679,000. Capital: Mexico City. Chief cities (pop., 1950 census): Federal District, including Mexico City, 3,050,442; Guadalajara 377,016; Monterrey 333,422; Puebla 211,331; Mérida 142,858; Torreón 128,971; San Luis Potosí 125,662; León 122,726; Ciudad Juárez 122,566; Veracruz 101,221; Tampico 94,345; Aguascalientes 93,358; Chihuahua 87,000; Tijuana 59,952; Saltillo 69,842; Mexicali 64,609; Morelia 63,245; Pachuca 58,658; Culiacán 48,963; Matamoros 45,737. Language: Spanish, with an estimated 6.29% (1940) speaking Indian tongues only. Religion: predominantly Roman Catholic. President in 1956: Adolfo Ruiz Cortines.

History.—Mexico entered 1956 faced with several major challenges, including a 3% annual population increase which was severely taxing the nation's housing, employment, schooling and food resources; expensive rehabilitation programs in Gulf coast and interior regions which had been damaged severely by floods and hurricanes late in 1955, and the marketing of Mexico's cotton crop on what appeared to be a ruinous world market.

As 1956 drew to a close, Mexico appeared to have moved toward a solution of the latter two problems, though the population increase remained to plague the nation's leaders. Pres. Adolfo Ruiz Cortines announced plans to rehabilitate the devastated regions, and for public works projects to reduce the possibility of damage from future storms.

Treasury Minister Antonio Carillo Flores pronounced Mexico healthy economically, noting that reserves had totalled \$410,000,000 at the end of 1955, highest in Mexican history and double the 1954 figure. He also pointed out that much of the fugitive capital which left Mexico following the peso devaluation of 1954 had returned, reflecting a growing confidence in the nation's economy. Among wage earners, however, there was widespread unrest because of rising prices. The cost-of-living index rose from 473 to 548 by the end of 1955 (1939=100).

Antonio J. Bermudez, director-general of Pemex, Mexico's government-owned oil company, announced in Oct. 1955 that Mexico might become self-sufficient in refined petroleum by mid-1956—the goal set after the nation expropriated foreign oil properties in 1938.

Japan and the German Federal Republic, among other countries, made spirited bids for increased trade with Mexico during 1956. Japan held its first industrial fair in Mexico City, and announced its wares in a series of full-page advertisements in the city's daily newspapers. Twenty west German bankers and industrialists visited Mexico to discuss expanded trade, and in 1956, western Germany supplanted Saudi Arabia as Mexico's best customer for silver.

At mid-year the government reported it would spend in 1956 about \$13,520,000 on highway construction and repairs. The marine ministry announced that Mexico had spent \$25,600,000 on "phase one" of its "March to the Sea" program of port development. This two-year phase was concentrated on bettering facilities in 16 major ports. Navy Minister Gomez Maqueo said that another \$25,000,000 would be expended by 1959 in the second phase, the development of numerous small harbours along the Gulf and Pacific coasts.

In public health, a campaign to wipe out malaria was announced. In co-operation with the United Nations International Children's Emergency fund and the World Health organization, Mexico planned to spend \$20,000,000 (of which Mexico would

supply \$12,000,000) over a five-year period. The campaign would concentrate on areas where about 16,000,000 persons were exposed to the threat of malaria.

The Mexican statistics bureau announced that half of all children between the ages of 6 and 14 would be unable to attend school in 1956 because of classroom shortages and predicted that the dilemma would become even worse.

Even more grave, however, was the disproportion between population increase and capital available for investment, according to Clemente Serna Martinez, president of the Confederation of National Chambers of Commerce. More capital must be invested to provide jobs for Mexico's growing working force, and to halt the exodus of Mexican labour to jobs in the United States.

Under a migrant labour contract with the United States, extended to Dec. 31, 1956, Mexico reduced its quota of migrant labourers to 200,000. This was a decrease of 80,000 from the 1955 total. Mexican farm operators protested that they did not have enough workers to harvest their own crops, and urged the government to halt the flow of *braceros* to the United States.

A 77-day student strike at the National Polytechnic institute, widely regarded as communist-inspired, was halted when President Ruiz Cortines met with a student committee to discuss reorganization plans for the institute. The president reportedly rebuked the students for the protracted strike which demanded, among other things, dismissal of the U.S.-educated director. He was too strongly U.S.-oriented, some students contended, but he was not dismissed.

(See also FOREIGN INVESTMENTS.)

(C. D. HE.)

Education.—In 1952 there were 25,613 primary schools with 75,958 teachers and 2,925,933 pupils; 544 secondary schools with 14,528 teachers and 85,663 pupils; 87 normal schools with 2,658 teachers and 13,281 pupils; and 591 technical schools with 11,704 teachers and 78,506 pupils. In 1951 the 39 institutions of higher learning, including 14 universities, had 7,350 teachers and 54,457 students. According to the 1950 census, 37.7% of the total population was illiterate. In 1954, only half the children of school age were in attendance.

Finance.—The monetary unit is the peso, valued at 7.99 cents U.S. currency during 1956. The 1956 budget totalled 6,700,000,000 pesos, about 49% of which was earmarked for economic development. Ordinary government revenue in 1955 was 7,000,000,000 pesos. According to the president's annual message to congress on Sept. 1, 1956, the public debt totalled 7,452,000,000 pesos on June 30, 1956, of which the domestic debt was 3,223,000,000 pesos, foreign debt 1,445,000,000 pesos and international credits for Nacional Financiera, S.A., 2,784,000,000 pesos. Currency in circulation (May 31, 1956) was 4,776,000,000 pesos; demand deposits, 5,720,000,000 pesos. The U.S. department of commerce estimated U.S. direct private investments in 1955 at \$599,000,000. The cost-of-living index (Mexico City) stood at 126 in Aug. 1956 (1953=100).

Trade and Communications.—Exports in 1955 totalled 7,772,984,294 pesos; dutiable imports, 9,899,458,591 pesos; imports entered in free trade zones, 1,147,620,032 pesos. Leading exports were cotton (30%), coffee (13%), lead (8%), petroleum and products (8%) and copper (7%); leading dutiable imports, machinery, apparatus and tools (29%), metals, minerals and manufactures (19%) and chemicals and drugs (13%). Leading customers were the U.S. (74%), Japan (6%), the U.K. (4%), Germany (4%) and the Netherlands (2%); leading suppliers, the U.S. (77%), Germany (4%), Canada (4%), the U.K. (3%) and Italy (2%).

Total railway mileage (1951), including auxiliary lines, was 14,575. All-weather highways (Dec. 31, 1954) totalled 16,155 mi.; dirt roads, about 62,000 mi. On Jan. 1, 1954, there were 253,354 automobiles, 179,564 trucks and 19,898 buses. According to *Lloyd's Register of Shipping*, the merchant marine had 67 vessels (100 tons and over) aggregating 171,979 tons on June 30, 1955. Telephones (Jan. 1, 1955) numbered 348,679.

Agriculture.—Production estimates in 1955-56 included maize 2,893,000 metric tons; wheat 825,000 tons; rice (rough) 179,000 tons; coffee 1,400,000 bags of 132 lb. each (exports 1955: 1,390,000 bags); cotton 2,250,000 bales of 500 lb. gross weight each (exports 1955: 352,420 tons); oranges and tangerines 17,637,000 boxes of 70 lb. each; limes 2,260,000 boxes of 80 lb. each; tobacco (1955) 83,775,000 lb.; henequen 209,400,000 lb. Sugar production included an estimated 917,000 tons of centrifugal sugar and 120,000 tons of *piloncillo*.

According to U.S. department of agriculture estimates, there were 16,000,000 cattle, 5,300,000 sheep and 7,900,000 pigs on Jan. 1, 1956; in Dec. 1952 (UN estimates) there were 3,000,000 horses, 9,000,000 goats, 1,000,000 mules and 2,800,000 donkeys.

Manufactures.—Production figures for 1955 included cement 2,050,000 metric tons; pig iron 327,600 tons; steel 525,600 tons; cotton yarn 5,880 tons; woven cotton fabrics 33,360 tons; wheat flour 383,800 tons; paper 171,698 tons; sulphuric acid 124,306 tons, tires 893,000 units. Installed electric energy capacity at the end of 1955 totalled 1,930,000 kw.; production (1955) was 7,000,000,000 kwhr.

Minerals.—Production in 1955 (excluding coal, petroleum and sulphur) totalled 1,041,303 metric tons valued officially at 3,520,802,997 pesos. Most important were zinc 269,399 metric tons; lead 210,815 tons; copper 54,676 tons; silver 47,956,548 fine oz.; gold 382,874 oz.; mercury 1,030

tons; iron ore (metal content) 429,246 tons; cadmium 1,295 tons; manganese 35,807 tons; antimony 3,818 tons; bismuth 351 tons; graphite 29,341 tons; tin 615 tons; tungsten 341 tons. In 1955, 89,400,000 bbl. of crude petroleum and 3,409,974,226 cu.m. of natural gas were produced. Coal production was 1,339,200 metric tons; sulphur (from all sources) 520,800 tons. (J. W. Mw.)

ENCYCLOPEDIA BRITANNICA FILMS.—*Arts and Crafts of Mexico* (1938); *Land of Mexico* (1939); *Mexico* (1955); *People of Mexico* (1939).

Michigan. One of the north central group of states of the United States, Michigan was the 26th state admitted to the union; it is popularly known as the "Wolverine state." Land area: 58,216 sq.mi. (excluding 39,960 sq.mi. of Great Lakes water surface); pop.: (1950 census) 6,371,766; (July 1, 1956, est.) 7,516,000. Of the state's population in 1950, 70.7% was urban and 29.3% rural; whites composed 92.9% of the population, nonwhites 7.1%. Capital: Lansing (pop. 1950 census) 92,129. Larger cities were (1950 census): Detroit, 1,849,568; Grand Rapids 176,515; Flint 163,143; Dearborn 94,994; Saginaw 92,918.

History.—At the time of the preliminary adjournment of the 1956 state legislature on April 7, Democratic Gov. G. Mennen Williams, acknowledging that the Republican legislature's accomplishments afforded "more reason for joy than he had anticipated," remarked that several important problems had been left unsolved, among them a school-aid formula which would provide equal opportunities for school children of rich and poor districts alike; the need for a vast expansion in the state parks program; the improvement of sanitation and housing standards for migrant workers; more and better mental and chronic health facilities and sufficient manpower to operate them. Fourteen bills, in fact, were left over for action at the reconvening of the legislature on May 10. Among them, three important appropriation measures, relating to capital outlay, mental health and public health, respectively, provoked inter-chamber disputes, but ultimately the legislature decided to appropriate \$40,000,000, \$60,000,000 and \$16,000,000, respectively, for these purposes. With *sine die* adjournment on May 12, total appropriations had reached a record \$329,500,000.

The budget was balanced without the imposition of new taxes, despite an over-all total of \$765,000,000 and a general budget of about \$330,000,000 (both figures establishing new highs). The list of measures adopted included an increase in old-age pensions from \$70 to \$80 per month; the removal of the boys' vocational school from its crowded quarters in Lansing; stiffer penalties for the distribution of obscene literature; a rewriting of the state milk law; the appropriation of \$217,000,000 for a school-aid program; and the setting up of machinery to convert Wayne university (hitherto controlled by the city of Detroit) into a state institution. Among the measures rejected were bills to take the state out of the retail liquor business; to restore capital punishment; to prohibit political contributions by labour unions; to give the vote to 18-year-olds; to provide pensions for legislators; to establish a \$1.25 minimum wage; and to revise the industrial safety law.

Governor Williams called the legislature into special session on June 13, to deal particularly with three issues: correction of a bond issue provision in the 1955 highway construction law; increases in the amount and duration of unemployment compensation benefits; an appropriation to avert the use of convict labour in the completion of a new prison at Ionia. The first of these issues was speedily disposed of. However, the governor's proposal to increase unemployment compensation benefits and to lengthen the maximum period met with sharp opposition. On June 15, the legislature adjourned for five days; on June 20, it recessed until July 17; on July 18, after passing a law expanding the state's polio vaccination program, it recessed until Aug. 9 (two days after the primary election). On Aug. 10, the Republican majority,

Agriculture.—Estimated production of ten major field crops in 1956 was 2% above the 1945-54 average, but 5% below the high outturn of 1955. The indicated total tonnage of the seven fruit crops was one-fifth above average and one-fourth above 1955. The field grain tonnage was expected to be 15% below the 1955 record production, reflecting mostly the lower oat acreage and yield. There were near-record crops of apples, grapes and pears.

Manufacturing.—Michigan's chief industry, automobile manufacturing, experienced a considerable decline in production during 1956, particularly during the early and middle months of the year. For the first six months total production was 25% lower than for the corresponding period in 1955. Unemployment was accordingly high, approximately 200,000 in the automobile industry alone, over a considerable period, but tending to decrease somewhat in the fall. (L. G. V. V.)

Mineral Production.—Table III shows the tonnage and value of those minerals produced in Michigan in 1953 and 1954 whose value exceeded \$100,000. In 1954 Michigan was first among the states in salt output with 25% of the national total, second in iron ore output, third in bromine, stone and titanium output. The state rated 14th in the value of its mineral output, with 2.01% of the U.S. total.

ENCYCLOPÆDIA BRITANNICA FILMS.—*Middle States* (2nd ed.) (1955).

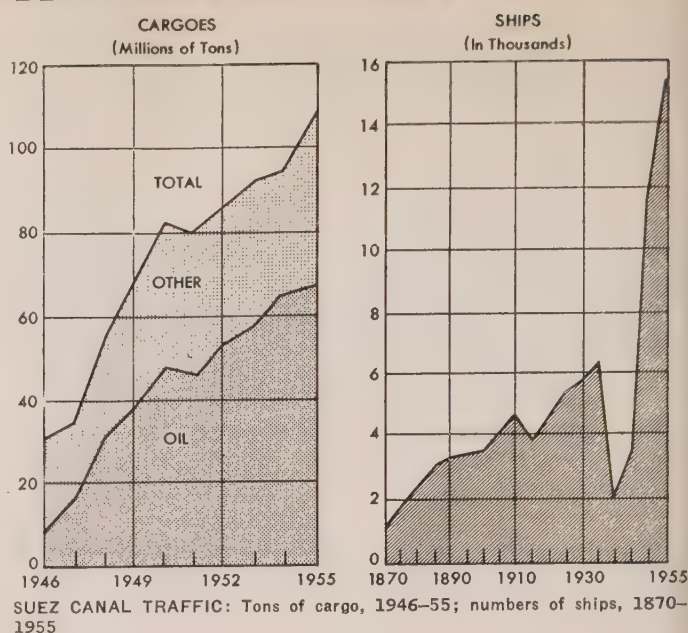
Microbiology: see BACTERIOLOGY.

Micronesia: see MARSHALL, CAROLINE AND MARIANA ISLANDS.

Middle Eastern Affairs. The year 1956 was one of the most eventful years in the recent history of the middle east. The previous year had weakened the western position in the eastern Mediterranean, because the conflict between Greece and Turkey regarding the future of the island of Cyprus disrupted the Balkan alliance between Greece, Turkey and Yugoslavia. This conflict continued unabated throughout the year 1956. The weakening of the Balkan alliance undermined also the strength of NATO (the North Atlantic Treaty organization) in the middle east, for in the Cyprus dispute Britain and Turkey on the one hand and Greece on the other hand occupied opposite sides, though all three were members of NATO. Nor did the Middle East Defense organization (MEDO), to which Britain, Iraq, Iran, Pakistan and Turkey belong, show in 1956 any effective progress. The organization was conceived to form a connecting link with the Atlantic alliance in the west through Turkey, and with the Southeast Asia Treaty organization (SEATO) to the southeast through Pakistan, and so to complete the system of western defense. The premier of Iraq, Nuri es-Said, was regarded as the most reliable friend of the west in the Arab world. At the beginning of 1956 there had been hope that other middle eastern Arab countries would join and strengthen the MEDO, but this hope was not realized.

Opposition to the Middle East Defense Organization.—The leadership of opposition to MEDO—i.e., opposition to a prowestern attitude among the Arabs—was assumed in the middle east by Egypt. Under Egyptian pressure the two most probable candidates for joining MEDO, Lebanon and Jordan, refused their co-operation. To counteract Iraq, Egypt entered into military pacts with Syria and Saudi Arabia. By a treaty signed in Damascus, Syria, on Oct. 20, 1955, Egypt and Syria established a joint command for peacetime and wartime of all their forces, including the troops stationed on the Palestine frontiers. The commander in chief of the unified command was to be responsible to a supreme council composed of the ministers of foreign affairs and defense of the two countries. Later in the same month a similar agreement was concluded between Egypt and Saudi Arabia. In a meeting which took place in Dec. 1955 in Riyadh, the capital of Saudi Arabia, under the chairmanship of King Saud, it was decided to appoint Maj. Gen. Abd el-Hakim Amer, Egyptian war minister, as commander in chief of the joint forces.

The struggle for Arab leadership between Egypt and Iraq centred in the beginning of 1956 on the kingdom of Jordan. Jordan's ruler was a cousin of the king of Iraq, and Jordan had had throughout its existence close treaty relations with Great Britain, from which Jordan received an annual subsidy of about \$33,000,000. A British effort to make Jordan adhere to the



MEDO led to nation-wide riots which forced the Jordanian government to affirm its opposition to joining any western-sponsored alliance. As a result of popular pressure the British commanding officer of the Jordanian Arab legion, John (later Sir John) Bagot Glubb, was abruptly dismissed on March 2, 1956. With this step the formerly very great British influence in Jordan came practically to an end. The new commander of the Arab legion, Gen. Radi Inab, inclined toward close co-operation with Syria and Egypt.

The Iraqi minister of the interior, Said Kazaz, the most influential member of the cabinet after the premier, explained Iraq's position in an interview on April 3, 1956; he said that Iraq felt more strongly than any other Arab state the danger of communism, because it was situated much closer to the "iron curtain." He believed that antiwestern feeling in Iraq was found only among a small minority and that it was caused by the Palestine problem. "The work of responsible people is to defend the country from Communists and from Zionism," Said Kazaz declared. "As long as you have 1,000,000 refugees living in misery, the feeling will exist and will gain strength. This is the root of all recent disorder in the middle east." In order to mitigate the bitter tensions between Israel and its Arab neighbours and to help stabilize the turbulent middle east, the secretary-general of the United Nations, Dag Hammarskjöld, in the spring of 1956 visited the middle east on behalf of the United Nations.

Communist Influence in the Middle East.—The growing prestige of Egypt as potential leader of the Arab world was strengthened by the support which the Soviet Union gave to the Egyptian premier (later president), Gamal Abdel Nasser. Nasser originally followed a policy of neutralism; he rejected any ties to the western powers and hoped—co-ordinating his efforts with those of India and Yugoslavia—to maintain a balance of power between the western world and the Soviet bloc. During 1956, however, Egypt became more and more estranged from the west and drew more closely to the communist orbit. Egypt had hoped for some time to receive arms from the west, but when these arms were not forthcoming Egypt accepted armaments from communist-dominated countries. With the armaments, technicians and instructors from communist lands arrived. Simultaneously Egypt's trade with eastern Europe and with communist China expanded, and many cultural missions were exchanged between Egypt and communist countries. Encouraged by communist sympathies as well as by those of other Asian and Afri-

an peoples, Nasser became the chief mover in a campaign to just all western influence from the middle east.

Egypt formed the centre of moral and material support for the North African movements of independence from France. In 1956 the French position in North Africa became seriously undermined. France had to recognize the sovereignty of its former protectorates Tunisia and Morocco, which became members of the United Nations, while in Algeria great French military efforts were unable to suppress the widespread Arab revolt and to re-establish orderly French rule. Similarly the tenuous remnants of British influence in the middle east, which had been dominant there in the period between World Wars I and II, practically vanished with the evacuation of the last British troops from the Suez Canal Zone and with the removal of British leadership from the Jordanian Arab legion. Nasser, on the other hand, was indefatigable in his efforts to strengthen his leadership in the Arab and Mohammedan world. The new Egyptian constitution of 1956 for the first time proclaimed Egypt to be an integral part of the Arab world.

Nasser regarded Egypt as the keystone of an Arab federation including all the lands from Morocco to the border of Iran and from the Mediterranean in the north to the southern borders of the Sudan, and although both Morocco and Iraq were hesitant to recognize Nasser's leadership, his position was enhanced by the new strength which the Egyptian army had gained with communist help and by the establishment of the joint command which united the armies of Syria and Saudi Arabia under Egyptian leadership.

The Suez Canal Conflict.—Nasser's regime had hoped for western financial help for the building of a high dam at Aswan to harness the Nile river in an effort to expand Egypt's agricultural area and thus to combat the poverty of the Egyptian masses. Although this western help had been promised, the United States abruptly withdrew its offer, and with similar abruptness the Egyptian government surprised the world by seizing full control of the Suez canal on July 26, 1956, and announced that profits from the waterway would be used to build the high dam at Aswan. Nasser promised that the stockholders of the Universal Suez Maritime Canal company, mostly French and British, would be repaid and that the great waterway would be kept safely open for international navigation. Nasser's announcement of the seizure of the Suez canal provoked sharp protest from Great Britain and France. The protest was directed not so much against the nationalization of the assets of the Suez Canal company as against the unilateral control of the internationally important waterway by Egypt alone. The Suez Canal company was organized in Egypt in 1856 under a franchise to build the canal and to operate it until 1968, when all its assets were to pass to Egypt. In a convention signed at Constantinople in 1888 all the great powers joined in guaranteeing the free, open and secure use of the canal without discrimination, for all time.

In a joint statement of Aug. 2, 1956, the United States, Britain and France did not question Egypt's right to exercise full sovereignty over the canal zone, including the right of nationalization of foreign property. But they expressed their apprehension that Egyptian operation of the canal threatened the freedom and security of passage through it. The British government, in order to assure the continuity of the operation of the canal as guaranteed by the convention of Oct. 29, 1888, consistent with legitimate Egyptian interests, sent out an invitation for a conference of all interested countries to meet in London on Aug. 16, 1956. Twenty-two nations participated in this conference, and 18 of them agreed to ask Egypt to enter into negotiations for the establishment of an international agency to operate the canal. Four countries—the U.S.S.R., India, Indonesia and Ceylon—refused to join in the decision. The 18 nations selected a committee

of five under the chairmanship of Robert Gordon Menzies, the Australian prime minister, to visit Cairo and to negotiate with Egypt. The mission failed in its purpose. The Egyptian government insisted that Egypt was willing and able to control the Suez canal operation alone and to guarantee not only free passage but also smooth transit for all ships. The resignation of French, British and other European pilots seemed to weaken Egypt's position, but by the end of September the expectation of the Egyptian government of being able to handle the canal traffic seemed borne out by the fact that the convoys were running smoothly through the shallow and narrow waterway under the guidance of mostly Egyptian pilots.

France and Britain took a very serious view of Egypt's action. France especially was worried lest the much-increased prestige of Nasser throughout the Arab world would make the maintenance of French rule in North Africa more difficult. French and British circles demanded energetic action. Both countries concentrated armed forces in the middle east. The United States tried to achieve the common purpose of assuring international operation of the waterway by peaceful means, and if need be by economic pressure. Upon the suggestion of the United States, representatives of the 18 governments that joined in the proposals submitted by Menzies to, and rejected by, the Egyptian government, met in London on Sept. 19, 1956, and decided to establish a Suez Canal Users' association. This association, it was declared, had the purpose to promote safe, orderly, efficient and economical transit through the canal of vessels of member nations; to seek the co-operation of the Egyptian authorities for this purpose; to receive and disperse revenues from the dues which any users of the canal might pay to the association; and finally to study means that might render it feasible to reduce dependence by the seafaring nations on the canal. At the same time the two main parties to the issue—the British and French governments, on the one hand, and Egypt on the other hand—informing the United Nations Security council of the situation that had arisen. The matter was under the consideration of the United Nations when, on October 29, 1956, Israeli forces started



"THE CHALLENGE," a 1956 cartoon by Haynie of the Greensboro Daily News (N.C.)

an invasion of Egypt and within a few days drove across the Sinai peninsula almost to the Suez canal. (For these and subsequent events, see *SUEZ CANAL CONFLICT*; *UNITED NATIONS*.)

Arab Unity.—Most observers believed that there lay ahead in the middle east a long period of instability, which might prove dangerous to western interests, while the Soviet Union could only gain from it. In 1956 the Russians seemed to have achieved what they had hoped for during the last century, a strong foothold in the strategically important middle eastern area. Of even greater significance for the future was the effect upon the middle eastern peoples of the position which the U.S.S.R. had assumed as spokesman for their interests; thus the Russians had come to be regarded as the friends of Egypt and of the Arab world. The conflict between Egypt and the western countries had solidified Arab support of Egypt; the long-sought goal of Arab unity, though not yet achieved, seemed nearer at the end of 1956 than at any preceding time. The accord for united action signed between Egypt, Syria and Saudi Arabia in Cairo in March 1956 was strengthened in many ways during the succeeding months. A military alliance between Egypt, Saudi Arabia and Yemen was signed in Jidda, Saudi Arabia, on April 21. In September Nasser flew again to Saudi Arabia to meet there with Saudi Arabian and Syrian leaders. The communiqué issued after the conference stated that "It gave a great deal of its attention to consolidating Arab security, warding off the Israeli threat and taking such steps as to complete the Arab policy drawn up in Cairo so that its implementation may continue with resoluteness and determination. . . . The conference supports Egypt fully in every attitude she takes and also backs Egypt's declared readiness to reach peaceful settlement that would safeguard Egypt's national interests and conform with the aims of the United Nations."

In mid-September King Saud of Arabia and the young King Faisal of Iraq met for the first time, and the meeting was believed to prepare for a reconciliation of and future co-operation between the two dynasties, which for many decades had been separated by a bitter family feud. One of the main elements cementing Arab unity at the end of 1956 was the Arab countries' growing fear of and hostility toward Israel and their desire to come to the help of Jordan in its conflict with Israel. At the end of Sept. 1956 the unrest on the Israel-Jordan frontier again reached dangerous dimensions and aggravated the general unrest in the middle east; thus in 1956 the area promised to form one of the west's chief concerns and the main immediate battleground between western and Soviet interests.

Nor was the problem of Cyprus brought nearer to a solution by the end of 1956. The talks which the British governor general, Field Marshal Sir John Harding, had conducted for five months were terminated without success at the end of February, and on March 9 Archbishop Makarios (*q.v.*), the political and spiritual leader of the Greek community on the island, was arrested and deported by the British government, which suspected him of backing the terrorists in Cyprus. The Turkish government continued to oppose strongly any step by which Britain would surrender its sovereignty over Cyprus. It regarded such a step not only as a threat to the position of the Turkish minority in the formerly Turkish possession but even more as a threat to the strategic security of nearby Turkey. A change in the political status of Cyprus, the Turks claimed, would upset the delicate balance established by the treaty of Lausanne, which after many centuries of bitter conflict had made peace between Greece and Turkey possible.

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Migration: see *IMMIGRATION, EMIGRATION AND NATURALIZATION*; *REFUGEES*.

Migratory Labour. The migration of workers from state to state to plant, cultivate and harvest the agricultural crops of the United States began about the beginning of the 20th century. But it was not until World War I that migrants began to be recognized as a significant source of seasonal farm labour. In the beginning, single men followed the grain and the fruit harvests of the middle west and the west coast. Later the migratory group began to include families, and many destitute dust-bowl farm families became migrants in the 1930s. During World War II the demand for seasonal workers increased and southern Negroes and their families swelled the ranks of the migrant workers.

There is no accurate count of agricultural migrants, but it was estimated that in 1956 there were in the United States approximately 650,000 migrant workers and their families, including Americans of Mexican origin, Negroes, Puerto Ricans and, in smaller numbers, native whites. Of these it was estimated that about 150,000 were nonworkers; *i.e.*, young children and aged persons. Relatively large-scale specialized agricultural production requires during short peak seasons more workers than can be recruited locally. The migrant helps to fill this gap. Among the crops for which migrants are used in large numbers are cotton, sugar beets, and small fruits and vegetables, such as strawberries, asparagus and beans. The migrants are recruited through the Farm Placement division of the state employment services, through crew leaders who contract to supply a series of employers with needed labour, or directly by the farmer himself.

There are four principal routes of migration in the United States: one along the east coast starting in Florida and moving with the fruit and vegetable crops as far north as New York and back to Florida. Another begins in Texas and travels to the north central and mountain states for work in sugar beets and in the vegetable and fruit harvests, returning to Texas in the late fall. The third route also begins in Texas and moves westward to the cotton fields of Texas and California and back to Texas for winter crops. The fourth, a west coast line, flows from southern California to Oregon and Washington, and back again to southern California in the late fall.

Migrant agricultural workers labour under many disadvantages. Their work is irregular, subject to interruptions caused by weather and crop conditions. They work for many employers for short periods. They lack the protection of labour laws. They do not have the protection of workmen's compensation laws if they are injured at work or of unemployment insurance if they are out of work. They must travel long distances during the season, and their transportation is often by truck, uncomfortable and frequently unsafe. Housing for the seasonal worker is often unsatisfactory and inadequate, and they have no choice as to where they will live. Too often the migrant and his family are crowded into labour camps, without adequate sanitary facilities, screens or proper cooking equipment. The health, welfare and other community services available to the community are usually denied to the migrant because of the restrictions of residence laws.

One of the most serious aspects of migratory labour is the effect upon the children. To eke out low family earnings, even very young children work in the fields with their parents. Although the employment of children under 16 years during school hours has been reduced appreciably by the enforcement of the Fair Labor Standards act and the child-labour laws of some states, neither the federal act nor most state laws apply to employment

side school hours. Moving from place to place during the school year, the children's educational progress is impeded. Some states receive these children in the public schools but in some nonresident children are not admitted and in others the compulsory school law is not enforced for migrants because of the lack of school facilities, difficulties of adjusting the school curriculum, or because of an unwillingness to have the migrant children in the local schools. At best most of them are retarded in their school progress; at worst they receive no schooling at all. In 1950, Pres. Harry S. Truman appointed the President's Commission on Migratory Labor. The report and recommendations submitted by this committee greatly stimulated interest in the migrant.

In 1950 the National Council on Agricultural Life and Labor was organized by church, labour and farm groups to serve as a clearing house on the problems of migrants and to encourage action in behalf of the migrant on the part of federal and state legislatures.

In 1954, Pres. Dwight D. Eisenhower appointed the President's Committee on Migratory Labor. This is a continuing committee of cabinet status with a work group made up of representatives of the departments represented on the committee. The objective of this committee is to provide a co-ordinated federal approach to the full utilization of existing resources in the extension of programs and services for migrants. In addition to its co-ordinating function, the committee through its working group deals with specific problems such as housing and transportation. In 1956 suggested standards for labour camp codes and for safe transportation were developed and made available to the states as a guide for action. The committee through its constituent federal agencies worked closely with the state agencies and with other interested groups in other ways to improve the working and living conditions of migrants and their families.

By 1956, 12 states had official state migratory labour committees. In a few of the other states, though no official committee had been appointed, there had been governmental investigations and recommendations that resulted in some community action. In many states throughout the country state agencies co-operated with county or local committees in developing programs to meet migrants' needs and many communities planned and carried out such programs on their own initiative. These actions provided the evidence that a beginning had been made in breaking down the indifference to migrants.

(B. McC.)

Bank Memorial Fund: see SOCIETIES AND ASSOCIATIONS,

Cheese: see DAIRY PRODUCTS.

Mindszenty, Joseph (1892—), cardinal and primate of Hungary, was freed from Communist captivity in 1956 after eight years of imprisonment. He was released on Oct. 30 by Hungarian revolutionary forces during their abortive revolt against soviet control. Almost immediately, however, the cardinal was forced to take refuge in the Soviet embassy at Budapest, Hung., when soviet troops overran Hungary, ruthlessly crushed the rebellion and installed a new pro-Soviet puppet government.

Joseph Cardinal Mindszenty was born March 29, 1892, at Gimindszent, Hung., of peasant parents, adopting his surname from his native town; his family name was Pehm. Ordained to the priesthood in 1915, he was named bishop of Veszprém, Hung., in March 1944 and archbishop of Strigonia (Esztergom) the following October. He was created cardinal, with 31 others, at the papal consistory of Feb. 18, 1946, in Rome, It. During World War II he had defied the German occupational authorities and had been imprisoned for four months in 1944 for speaking against the nazi-

sponsored government of Hungary. Under the communist regime that seized control of Hungary in 1947, Cardinal Mindszenty was to undergo worse treatment. On Dec. 26, 1948, he was arrested on charges of treason and "espionage on behalf of the imperialists" and subjected to six weeks of interrogation. After a mock trial in Budapest in Feb. 1949 he was sentenced to life imprisonment by the Communist tribunal in Budapest. In 1955 he was reportedly offered his freedom in return for a promise not to preach publicly in Hungary, but he declined. Following his liberation, he appealed to the United Nations for immediate aid to Hungary against Soviet oppression, declaring that "a man who is drowning needs (more than) messages."

Mineral and Metal Production and Prices.

After the fine record experienced in 1955 in the production of minerals and metals in the United States, a levelling off was expected in some quarters. However, with respect to many commodities, including all of the principal metals, production in 1956 was even greater than in 1955. There was increased demand for all of the main metals, such as aluminum, copper, lead, zinc, iron and steel. Aluminum consumption had in fact become so large that the search for new sources of bauxite was greatly accelerated. On July 16, 1956, the U.S. extended the suspension on duty of bauxite for another two-year period.

Canadian interests were proceeding with expansion of the Jamaican bauxite facilities at a cost of \$28,000,000, to meet the needs of the Kitimat smelter. Jamaica's target was 543,000 tons annually by 1957.

In India, there was activity, both government and private, in all kinds of mineral production, especially petroleum, but also manganese, iron, coal and steel.

The feasibility of building an alumina reduction plant on the Coroni river in Venezuela was being studied.

The demand for copper remained strong during the year, and the United States was trying to improve its techniques of treating and mining its low-grade copper ores. This policy extended also to iron, manganese and lead.

Studies were made on mineral taxation and many tax proposals were examined by the U.S. bureau of mines in co-operation with the treasury department to determine their effects on mineral industries.

There were many strikes in the various metal plants and mines but none seriously interfered with the total output for the year. At one time a strike idled about 40% of the aluminum capacity, and production was said to have been reduced by 59,000 tons, but before the end of 1956 some of this was made up. The strikes were settled and new three-year pacts were made in the copper, zinc, lead and aluminum plants. There was also a steel strike which shut down 90% of the mills during the month of July.

It was believed that mergers of the coal companies would benefit both operators as well as workers. This was a new viewpoint for labour but such mergers would lessen competition within the industry and enable it to present a united front. The coal industry faced increasing competition from gas and oil fuels as well as from atomic energy and water power.

Copper prices were highest in 1955 since 1865, and they rose still higher in 1956. Prices of most of the other mineral and metal commodities also rose during the year.

An excellent table on world production of minerals by hemispheres (eastern and western) was compiled in the division of foreign activities of the U.S. bureau of mines (see *Mineral Trade Notes*, Jan. 1956).

(See also GEOLOGICAL SURVEY, U.S.; and separate articles on the various mineral commodities for further details.)

(F. E. H.)

Metric tons unless otherwise specified; Th. indicates thousands, Mi. millions of units)

Country	Alu- minum (Th.)	Bauxite (Th.)	Anti- mony*	Arsenic†	Asbestos (Th.)	Brille (Th.)	Beryl	Bismuth	Cad- mium	Cement (Th.)	Chromite (Th.)	Coal (Ml.)	Coke (Ml.)	Cobalt	Copper (in ore)	Copper (smelter)	Diamonds (Th. carats)	Field- spar (Th.)	Fluor- spar (Th.)	Fuel briquets (Th.)	Gold (Th. oz.)	Graphite (Th.)	Gypsum (Th.)	Uranite (Th.)	Iron ore (Th.)	Pig iron (Th.)	Steel (Th.)
North America																											
Canada	529.9	—	894	295	991.0	183.8	—	94.2	894.0	3,996	—	13.44	3.37	1,361	296.3	263.5	—	16.5	119.5	593	4,556.4	—	4,352.8	15,764	3,067	4,109	
Central America			3,818	2,953	—	106.7	—	351.0	1,295.1	2,086	0.3	1.34	0.45	—	54.7	45.1	—	—	131.6	—	382.9	29.3	P	100	323	737	
Mexico	1,420.4	1,847.27	574	5,779	40.4	1,023.8	454	?	4,510.2	50,624.7	139.0	450.307	88.31	1,106	905.9	1,003.8	—	579.7	253.6	1,541	1,876.8	5.73	9,591.97	104,660	71,906	106,173	
South America																											
Venezuela	—	2,570.2	—	—	—	—	—	—	—	670	74.2	—	—	—	18.8	—	—	—	—	—	—	—	—	—	—	—	
Argentina	—	—	6	P	0.2	20.07	1,350	16.8	—	1,848	0.13	—	—	—	—	—	—	12.0	11.0	—	—	P	130.0	70	36	2187	
Bolivia	—	—	5,369	—	—	—	—	42.9	—	38	—	—	—	—	3.5	—	—	5.0	0.5	—	—	—	—	—	—	—	
Brazil	1.6	31.87	—	1,157.4	1.17	4.6	1,651	P	—	2,692	2.77	2.26	0.487	—	—	—	—	—	—	—	—	—	—	—	—	—	
British Guiana	—	2,474.4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Colombia	—	—	—	—	P	2.0	—	—	—	841	—	—	—	—	433.5	432.9	35	21.3	—	—	—	—	—	4,150	1,087	1,248	
Costa Rica	—	—	—	—	—	8.0	—	—	—	1,105	—	1.85	0.167	—	—	—	—	—	—	—	—	—	—	1,712	256	3497	
Ecuador	—	—	—	—	—	2.0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	350	—	—	
Peru	—	—	871	95.4	—	8.5	—	333.3	62.6	545	0.08	0.117	—	—	47.4	31.6	—	180.0	—	—	—	—	—	1,730	—	—	
Surinam	—	3,061.9	—	—	—	—	—	—	—	—	0.03	—	—	—	—	—	141	—	—	—	—	—	—	8,439	—	—	
Venezuela	—	—	—	—	1.6	—	—	—	—	1,282	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Europe																											
Austria	57.2	19.1	400	P	—	4.0	—	—	—	1,859	6.79	1.45	—	—	2.6	10.3	—	2.6	—	—	—	—	—	—	2,838	1,508	
Bulgaria	—	—	2,069	—	—	—	—	475.07	—	4,960	28.837	28.837	0.037	—	—	—	—	—	—	—	—	—	—	—	106	5,377	
Czechoslovakia	P	—	1,600.4	P	—	P	—	—	—	4,960	63.90	6.207	—	—	—	—	—	—	—	—	—	—	—	—	4,960	3,0007	
Finland	—	—	—	P	16.9	P	—	—	—	3,100	1,010	—	—	P	21.5	22.3	—	P	65.0	807	807	18.8	—	85.0	184	115	
France (incl. Saar)	129.5	1,492.8	—	737.4	9.9	55.0	—	31.5	180.0	10,073	74.72	14.66	0.427	—	0.57	P	—	73.0	—	60,6987	58.03	—	3,330.0	50,320	13,965	14,620	
Germany, East	137.1	—	—	—	—	55.07	—	P	—	3,1007	204.30	40.82	—	—	23.07	27.07	—	—	80.07	60,8007	—	—	—	1,600	1,500	2,500	
Greece	—	—	503	756	40.5	19.9	—	—	321.6	1,129	34.1	22.50	40.82	P	1.2	239.7	—	172.4	180.0	22,913	3.8	10.5	871.1	15,584	16,482	21,336	
Hungary	37.0	500.2	P	P	—	—	—	—	—	1,200	22.50	7.8	—	—	P	—	—	—	—	—	—	—	—	1,637	1,500	1,637	
Ireland	—	1,241.0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	353	885	1,637	
Italy	61.5	326.0	325	1,070.3	30.2	94.2	—	—	196.5	683	0.20	—	2.95	—	0.3	0.3	—	43.4	100.4	35	—	—	92.33	207	1,734		
Netherlands	—	—	—	—	—	—	—	—	—	1,507	1.55	—	—	—	—	—	—	—	—	—	—	—	—	1,349	5,395	5,395	
Norway	72.1	—	—	—	—	—	—	—	—	1,430	12.15	3.90	—	—	14.0	13.5	—	27.0	0.3	1,061	—	—	—	7,205	3,085	3,225	
Poland	—	—	5.4	6007	0.1	0.3	—	—	250.07	3,7007	100.50	10.00	—	—	0.9	—	—	P	—	8407	16.1	5.4	—	1,902	3,120	4,450	
Portugal	—	16.07	—	—	—	—	297	P	—	2,779	0.50	—	—	—	—	—	—	P	—	—	96	57.94	—	0.6	140	—	
Romania	527	—	1807	70.4	—	9.0	—	19.7	10.07	2,000	6.207	0.507	—	P	16.1	5.9	—	P	63.0	7607	9.74	1.1	1.07	3,886	995	1,212	
Spain	10.4	6.4	—	12,522	—	—	—	86.0	—	2,751	14.18	0.45	—	—	15.7	17.3	—	50.9	—	1.3	1,007	121.4	1.07	17,121	1,246	2,126	
Switzerland	30.0	—	—	—	—	—	—	—	—	2,111	0.017	—	—	—	—	—	—	—	—	—	—	150.04	—	71,8007	33,3007	45,304	
U.S.S.R.	400.07	1,000.07	—	—	220.07	100.07	P	P	150.07	22,5007	600.07	391.007	0.12	—	350.07	350.07	P	P	100.07	8,5007	9,000.07	—	—	17,121	1,246	2,126	
United Kingdom	24.8	—	—	P	—	83.6	—	—	150.7	12,708	18.39	25.25	—	—	—	—	—	P	—	705	2,961.5	—	—	16,435	12,670	20,109	
Yugoslavia	11.5	791.0	1,605	P	3.9	99.0	—	104.1	150.7	1,563	126.2	125.1	0.73	—	28.3	28.3	—	P	87.3	1,712	36.63	0.9	77.0	1,398	531	819	
Africa																											
Algeria	—	—	1,020	—	—	30.6	—	—	—	655	0.30	—	—	—	P	0.8	—	—	—	24	—	—	72.94	—	—	—	
Angola	—	—	—	—	—	—	—	—	—	70	—	—	—	—	235.1	235.1	—	—	—	—	—	—	—	—	—	—	
Burkina Faso	—	—	—	—	—	—	328	—	165.9	1,371	0.8	0.48	—	8,567	—	—	—	—	—	—	—	—	—	—	—	—	
Egypt	—	—	—	—	—	0.1	—	0.14	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Ethiopia	—	—	—	—	—	—	—	—	—	287	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
French Morocco	493.0	—	—	—	—	—	—	—	—	129	—	—	—	757	—	—	—	—	—	—	—	—	—	—	—	—	
Gold Coast	118.2	—	317	—	0.6	24.6	2	—	—	685	—	—	—	—	0.7	—	—	P	—	4	—	—	—	—	—	—	
Madagascar	—	—	—	—	—	—	—	—	—	131	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Nigeria	—	—	—	—	0.1	—	287	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Northern Rhodesia	—	—	—	—	—	—	18	—	—	337	—	—	—	790	358.6	347.7	—	—	—	—	—	—	—	—	—	—	
Sierra Leone	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
South Africa	14,199	—	—	—	108.6	1.7	114	0.1	—	2,336	20.1	32.15	1.40	—	44.6	43.1	930.7	6.5	29.8	—	—	—	—	1,353	1,300	1,580	
South Africa (Natal)	202	—	—	—	95.5	0.4	428	1.1	635.9	410	407.5	3.32	0.197	—	21.4	21.4	813	—	0.4	—	—	—	1.7	1,999	55	—	
South-West Africa	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Spanish Morocco	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Tanganyika	360	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Tunisia	—	—	—	—	—	—	100	—	—	384	—	—	—	—	0.8	—	326	—	—	—	—	—	—	—	—	—	
Uganda	—	—	—	—	—	—	—	—	—	50	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Asia																											
Burma	7.07	—	557	P	—	P	—	P	—	60	—	92.31	4.507	—	9.07	9.07	—	P	—	—	—	—	—	—	—	—	
China	—	—	12,0007	—	15.6	—	—	—	5,0007	—	8.7	—	—	—	23.1	23.1	—	—	—	—	—	—	—	—	—	—	
Ceylon	—	—	—	—	0.4	—	—	—	—	590	—	2.36	0.13	—	1.0	1.2	—	—	—	—	—	—	—	—	—	—	
Formosa	7.0	10.07	—	—	0.47	20.07	767	—	—	4,487	65.07	38.83	2.64	—	7.7	7.4	P	6.07	—	—	—	—	—	—	—	—	
India	7.3	82.07	—	—	—	—	—	—	—	260	—	1.10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Indochina	—	—	—	—	—	—	—	—	—	1507	15.07	0.81	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Indonesia	—	—	—	—	—	—	—	—	—	7857	—	0.187	P	—	—	—	—										

Notes: A: 1 indicates an estimate or no data available. The letter "p" indicates a small production, unknown in amount or less than the minimum base of the table. "P" indicates a larger but unknown production. *Metal content of ore. †Whitite arsenic. ‡Nitrogen content of fertilizer compounds. §Includes all platinum group metals. ¶K₂O equivalent of salts produced. ††Includes combined tantalum and columbium concentrations. ‡‡955 figures are lacking.

Table II.—Mineral and Metal Prices in 1956

New York market as reported by E. & M. J. Metal and Mineral Markets				London market as reported by the Metal Bulletin									
		Commodity				January		October					
January	October	Grade	Units	Grade	Units	£	s.	d.	£	s.	d.		
24.4 ¢	27.1 ¢	99% ingot	Pound	Aluminum	99.5%	Long ton	179	..	..	197	..	..
\$ 3.35	\$ 3.35	50-55% Sb	S.T. unit	Antimony, Ore	50-55% Sb	Unit	..	21	6	..	22	6	
\$ 36.47	\$ 36.47	Domestic, cased	Pound	Antimony	Domestic, 99%	Long ton	210	..	..	210	..	..
5.50 ¢	5.50 ¢	White oxide	"	Arsenic	Foreign, 99%	"	50	..	..	45	..	..
(e)	(e)	4% Be	"	Beryllium-copper alloy	4% Be	"(d)	..	25	5	..	24	11	
\$ 2.25	\$ 2.25	Ton lots	"	Bismuth	"	"	..	16	..	..	16	..
\$ 1.70	\$ 1.70	Commercial sticks	"	Cadmium	99.9%	"	..	12	..	..	12	..
\$ 46.00	\$ 58.50	48% Cr ₂ O ₃ , 3 Cr:1 Fe	Short ton	Chromium, Ore	Rhodesian, 1st grade	Long ton	15	2	6	16	5	..	
\$ 1.25	\$ 1.29	97% spot	Pound	Metal	98-99%	Pound	..	6	7	..	6	7	
\$ 26.25 ¢	27.75 ¢	4-9% C, 65-70% Cr (a)	"	Ferroalloy	4-6% C, 60% Cr	Long ton	88	10	..	95	..	..
\$ 2.60	\$ 2.60	Domestic	"	Cobalt	"	Pound	..	21	..	..	21	..
\$ 43.749 ¢	38.623 ¢	Export	"	Copper	Fire ref., high grade	Long ton	(e)	..	..	(e)	..	..
\$ 45.562 ¢	35.431 ¢	99.9% In	Ounce	"	Wire bars, high grade	"	418	17	6	280	7	6	
\$ 35.00	\$ 35.00	Sponge, powder	"	"	Official	Ounce	..	249	6	..	251	5 1/2	
\$ 2.25	\$ 2.25	Mesabi, nonbessemer	Long ton	Iridium	"	"	..	12	6	..	12	6	
\$ 110.00	\$ 110.00	80% Joplin, Mo.	Short ton	Lead, Ore	Sponge, powder	"	..	(e)	..	(e)	..	..
\$ 10.95	\$ 10.85	New York	Pound	Metal	"	"	..	(e)	10	..	5	..	
\$ 202.25	\$ 201.32	99.8% car lots	"	Magnesium, Ingots	Foreign, soft	Long ton	126	7	6	115	7	6	
\$ 16.151 ¢	\$ 16.00 ¢	48% Atlantic ports	L.T. unit	Sticks	"	Pound	..	2	4	..	2	4	
\$ 32.50	\$ 35.25 ¢	95.5% Mn, 2% Fe	Pound	Manganese, Ore	Bars	"	..	2	8 3/4	..	2	8 3/4	
(e)	(e)	74-82%	net ton	Metal	48% Mn	Unit	..	..	98	..	..	125
\$ 1.20	\$ 1.415 ¢	19-21% Mn	Long ton	Ferroalloy	96-98% Mn	Long ton	269	..	..	265	..	..
\$ 45.00	\$ 45.00	(76 lb.)	Flask	Spiegel	78% Mn	"	54	10	..	68	..	..
\$ 205.00	\$ 235.00	Mo, Climax, Colo.	Pound	Mercury	20% Mn	"	30	..	..	30	..	..
\$ 91.50	\$ 99.50	99% Mo	"	Molybdenum, Ore	"	Flask	88	10	..	83	10	..	
\$ 273.04	\$ 254.769	58-64% Mo	"	Metal	85% MoS ₂	Unit	8	4	2	8	2	6	
\$ 1.10	\$ 1.18	Cathodes	Ounce	Ferroalloy	Powder	Pound	..	40	..	..	35	..
\$ 3.20	\$ 3.35	24% P, car lots	Gross ton	Nickel	65-75% Mo	"	..	11	..	..	12	3
\$ 1.66	\$ 1.74	Wholesale	Ounce	Palladium	Refined	Long ton	519	..	..	519	..	..
\$ 64.5	\$ 64.5	99.5%	Pound	Phosphorus, Ferro-	"	Ounce	8	10	..	8	..	..
\$ 24.00	\$ 24.00	97+1% Si, spot	"	Platinum	20-25% P	Long ton	35	..	..	38	..	..
\$ 100.00	\$ 100.00	50% Si	"	Rhodium	"	Ounce	32	10	..	34	..	..
\$ 103.56	\$ 104.00	75% Si	"	Selenium	99.5%	"	42	..	..	42	..	..
\$ 125.00	\$ 125.00	Foreign, New York	Ounce	Silicon	98% Si	Pound	..	72	..	..	112	..
\$ 10.50	\$ 15.50	60% Ta ₂ O ₅ -Cb ₂ O ₅	Pound	"	25% Si	Long ton	152	..	..	152	..	..
\$ 20.50	\$ 20.50	Sheel	Kilo	Tellurium	75% Si	"	39	..	..	41	..	..
\$ 12.75	\$ 13.50	Straits	Pound	Tin	Official, spot	Ounce	..	..	78 3/4	..	79 3/4	..
\$ 90.357 ¢	91.176 ¢	20-25% Ti	Short ton	Titanium, Ferroalloy	60-65% Ta ₂ O ₅	Unit	62	..	..	62	..	..
(e)	(e)	59.5% TiO ₂	Gross ton	" ilmenite	Powder	Pound	..	(e)	..	..	(e)	..
\$ 93.00	\$ 100.00	94% TiO ₂	Pound	" Rutile	99%+	Long ton	845	..	..	815	..	..
\$ 1.75	\$ 1.75	Domestic	S.T. unit	Tungsten, Ore	20-25% Ti	"	230	..	..	250	..	..
\$ 104.82 ¢	105.764 ¢	Foreign	"	" Ferroalloy	52-54% TiO ₂ , Malayan	Long ton	8	10	..	9	15	..	
\$ 1.50	\$ 1.50	70-80% W	"	" Powder	95% TiO ₂ , Australian	"	100	..	..	95	..	..
\$ 29.00	\$ 30.00	98.8% W	"	Vanadium, Ore	65% Wolframite	Unit	..	268	..	..	227	6
\$ 15.00	\$ 13.50	50-55% V	"	Zinc, Ore	65% Scheelite	"	..	(e)	..	..	(e)	..
\$ 63.00	\$ 55.00	60% Joplin, Mo.	Short ton	Metal	80-85% W	Pound	..	21	3	..	16	..	
\$ 34.50	\$ 28.75	St. Louis	Pound	"	98-99% W	Pound	..	21	6	..	19	..	
\$ 3.30	\$ 3.45				90-95% Fused Oxide	Unit	12	..	..	13	10	..
\$ 4.30	\$ 4.50				50-60% V	Pound	..	27	6	..	27	6	
\$ 31.00 ¢	31.00 ¢				G.O.B., foreign	Long ton	..	(e)	..	..	(e)	..
\$ 3.10	\$ 3.20						105	2	6	95	2	6	
\$ 80.00	\$ 84.00												
\$ 13.431 ¢	13.50 ¢												

(a) Per pound of base metal contained. (b) Per pound of contained Mo, f.o.b. Climax, plus cost of containers. (c) Per pound of V₂O₅ contained. (d) Per pound Be plus 4s.3d. per pound of alloy. (e) Not quoted.

Mineralogy. During the year 1956 the following new minerals were described: nekoite, a calcium silicate, Ca₃S₁₆O₂₁H₁₂, from Crestmore, Calif., by J. A. Gard and H. F. W. Taylor (*Mineralogical Magazine*, xxxi:15-20 [London]); tavorite, hydrous lithium iron phosphate, LiFe(PO₄)(OH) and barboselite, hydrous iron phosphate, Fe^{III}Fe^{III}₂(PO₄)₂(OH)₂, both from the Sapucaia mine, Minas Gerais, Braz., by M. L. Lindberg and W. T. Pecora (*American Mineralogist*, 40:952-966); abernathyite, a uranium mineral, K(UO₂)(AsO₄)·4H₂O, from the Fuefrol No. 2 mine, Emery county, Utah, by M. E. Thompson, Blanche Ingram and E. B. Gross (*ibid.*, 41:82-90); osumilite, a complex silicate, from Sakkabira, Kyusyu, Jap., by Akoho Miyashiro (*ibid.*, 41:104-116); coffinite, a uranous silicate, probably U(SiO₄)_{1-x}(OH)_{4x}, from uranium deposits in the Colorado plateau, by L. S. Stieff, T. W. Stern and A. M. Sherwood (*ibid.*, 41:675-688).

The third and fourth parts of the interesting "Jade Story—European" by Elsie Ruff were published in *Journal of Gemmology*, vol. v, pp. 141-152 and 274-291 (London, Eng.). In his article "Emerald" (*ibid.*, vol. v, pp. 185-221), Robert Webster discussed in great detail the lore, nature, occurrences and the imitation and synthesis of the gem mineral. The results of a comprehensive investigation of the mineral chalcedony were reported by C. R. Pelto (*American Journal of Science*, vol. 254, pp. 32-50). The high temperature and pressure methods developed by the General Electric company were applied and were described by R. H. Wentorf, Jr., in "The Formation of Gore Mountain Garnet and Hornblende" (*ibid.*, vol. 254, pp. 413-419).

The following texts were published: *Mineral Facts and Problems*, Bureau of Mines Bulletin 556 (Washington, D.C.). More than 50 authorities contributed to this encyclopedic volume. *The Microstructures of Diamond Surfaces*, by S. Tolansky (London); *Petrographic Mineralogy*, by E. E. Wahlstrom (New York); *Microscopic Petrography*, by E. W. Heinrich (New York); *My Hobby Is Collecting Rocks and Minerals*, by D. E. Jensen (New York); *Echt Oder Synthetisch?*, by K. F. Chudoba and E. J. Gübelin (Stuttgart, Germany).

The November-December, 1955, issue of the *American Mineralogist* (40:945-1155) was dedicated by his colleagues and friends to Edward Henry Kraus of the University of Michigan on the occasion of his 80th birthday in recognition of his services to mineralogy, the Mineralogical Society of America, and the University of Michigan. Kraus was chairman of the organization committee and first president of the Mineralogical Society of America, and its honorary president since 1954. Aside from the dedication article by W. F. Hunt (pp. 945-951), the publication also contained other articles on a wide range of subjects.

Arthur F. Buddington of Princeton university was selected to receive in 1956 the Washington A. Roebling Medal of the Mineral Society of America. The society also designated Julian R. Goldsmith of The University of Chicago as the recipient of its annual award for 1955 for meritorious achievement by a young scientist, and George C. Kennedy of the Institute of Geophysics of the University of California at Los Angeles for the 1955 award. (See also MINERAL AND METAL PRODUCTION AND PRICES.

(E. H. KR.)

ing: see MINERAL AND METAL PRODUCTION AND PRICES.
also under various minerals.

Minnesota. A north central state, admitted to the union on May 11, 1858, Minnesota includes the northernmost land in the United States—the northwest angle. Minnesota is variously known as the "land of the sky-blue waters," "land of 10,000 lakes," "North Star state" and "Gopher state." The water area covers 4,059 sq.mi. of its total area of 84,068 sq.mi. Population: (July 1, 1956, est.) 3,241,000; (1950 census) 2,982,483, of which 54% lived in cities of 2,500 or more. The three largest cities were (1950 pop.): Minneapolis 521,718; St. Paul, the capital, 311,349; Duluth 104,511. Next in size were Rochester 29,885; St. Cloud 28,410; Winona 25,031; and Austin 10,000.

History.—Minnesota's economy, particularly industrial development, was marked by steady expansion during 1956. Though farm prices remained depressed, gross farm income maintained level about \$8,000,000 above that of 1955 as the year drew to close. Personal income reached an all-time high at \$5,500,000, an increase of 7% over the previous year. Nonagricultural employment also set a record of 918,000 in Sept. 1956. In 1950 dollar value of manufactures exceeded cash farm receipts for the first time in the state's history. The spread in favour of manufactures continued to widen in 1956, a clear indication that manufacturing was gaining a more influential position in the state's economy.

Visible signs of industrial growth were the establishment of a Remington Rand UNIVAC plant in St. Paul, a large International Business Machines plant in Rochester and the erection of a \$5,000,000 plant in Breckenridge of Spencer Kellogg & Sons, Inc., for processing soybeans and flax.

The supreme court of Minnesota invalidated the major reorganization act of 1955 because of a far-reaching clerical error in the printing of the bill. Gov. Orville L. Freeman's administration undertook a "Minnesota self-survey," a top-to-bottom analysis of the management, personnel, operating procedures and needs of the state government.

In the general election on Nov. 6, Dwight D. Eisenhower carried Minnesota with a plurality of about 100,000 out of a total vote of 1,340,000. An unusual feature of the election was that approximately 80,000 more Minnesotans voted for state offices than for president. The Democratic-Farmer Labor party succeeded in re-electing all but one of the incumbents in its state administration. They were: governor, Orville L. Freeman; lieutenant governor, Karl F. Rolvaag; secretary of state, Joseph L. Moovan; attorney general, Miles Lord. The one exception was ex treasurer Arthur Hansen, who was defeated by a Republican, Val Bjornson. The lone Republican among the chief state officials, Stafford King, state auditor, and the U.S. senators, Edward J. Thye (Rep.) and Hubert H. Humphrey (Dem.-F.L.), were not subject to election during 1956. All nine members of the U.S. house of representatives from Minnesota (five Democratic-Farmer Labor and four Republican) were re-elected. Two were state supreme court justices Leroy E. Mattson and William P. Murphy. (R. W. F.)

Education.—Approximately \$297,194,038 was spent for education by the 3,364 public-school districts in Minnesota for 1955-56. This amount provided for 368,885 pupils in 3,364 elementary schools, 228,078 in 658 secondary schools, 3,358 pupils in area-vocational schools, 1,711 in 9 junior colleges and 78 in 5 teacher training departments. These pupils were taught by 13,798 elementary teachers, 11,393 secondary teachers, 198 teachers in area-vocational schools, 125 teachers in junior colleges and 5 teachers in teacher training departments. In addition, five teachers' colleges were operated from public funds. For the support of these public elementary and secondary schools, the state contributed \$79,599,445 revenue from state funds and the state income tax. Dean M. Schweickhard was commissioner of education.

Public Insurance and Assistance, Public Welfare and Related Programs.—In June 1956 about 93,758 persons received financial assistance, which amounted to \$61,362,895 for the 1956 fiscal year. As of March 31, 1956,

there were 18,799 children receiving services from public welfare agencies. Children receiving services from physicians under the Minnesota Crippled Children's program during 1954 totalled 4,782.

About 640,000 workers were covered by the Minnesota Employment Security law during 1955. Their wages amounted to \$2,365,531,000 for the year. An estimated \$21,777,921 was paid in unemployment compensation benefits during 1955.

In Sept. 1956 the state prison and two reformatories had a total of 2,032 inmates. June counts showed the eight state mental hospitals as having 11,156 patients, the unit for alcoholics 196 inmates and the six units for mentally deficient and epileptic 5,086 patients. Gillette State Hospital for Crippled Children had 130 patients. As of Sept. 1956 the two special schools for the blind and deaf had 364 pupils.

On June 30, 1956, 386 inmates at the state reformatory for men at St. Cloud were the responsibility of the Youth Conservation commission. Of this number, 54 were in the diagnostic centre and 332 in the reformatory proper. On June 30 also, there were two young women at Shakopee who had been committed to the Youth Conservation commission.

In addition, there were 52 young men who had been committed through the criminal courts of the state who were then in residence at the Willow River Forestry camp, and 22 committed by the juvenile courts who were at the Thistledeew Lake Forestry camp.

Communications.—The systems of highways and streets maintained by various governmental units as of Jan. 1, 1956, totalled 122,757 mi. These included 11,817 mi. of state trunk highways, 43,598 mi. of county roads, 55,437 mi. of township roads, 9,222 mi. of municipal streets in addition to those on the trunk highway system, and 2,683 mi. of state and national park, forest and institutional roads. Fiscal year (ending June 30, 1956) expenditures for construction and maintenance of the trunk highway system, including right of way, totalled \$71,691,369. There being no indebtedness, investment of available unencumbered cash brought \$1,226,313 in interest to the highway funds.

As of Dec. 31, 1954, railroad main-line trackage totalled 8,328 mi. for the 22 railroads operating in the state. Another 4,350 mi. was reported for other tracks—second main line, siding, yards and switching tracks.

Of the 436 airports in the state, 97 were municipally owned, 19 were public seaplane bases, 23 were public airports privately owned and one was a military airport—at Camp Ripley. There were also 296 private landing fields.

Banking and Finance.—Minnesota's 680 state and national banks reported total resources of \$3,972,062,949 on June 30, 1956, compared with \$3,873,249,500 for 681 banks on June 30, 1955. Represented were 499 state banks, 1 mutual savings bank and 3 trust companies reporting deposits of \$1,308,079,942, an increase of \$51,840,942, and resources of \$1,428,055,949, an increase of \$60,733,949. Deposits for 177 national banks were \$2,289,180,000, a decrease of \$530,400, with resources totalling \$2,544,007,000, an increase of \$38,079,500.

The 76 state- and federal-chartered savings, building and loan associations reported resources of \$880,227,893 in 1956 as compared with \$754,298,245 the previous year. This represented 39 state-chartered associations with resources of \$203,930,694 and 37 federal savings and loan associations with resources of \$676,297,199.

The 352 state-chartered credit unions reported assets of \$65,307,492 as of Dec. 31, 1955, and the federal credit unions had \$4,467,984 in assets.

Net disbursements of the state government totalled \$579,466,243.51 for the fiscal year ending June 30, 1956, compared with \$532,836,605.10 in 1955. Total state indebtedness in bonds and certificates was raised by a net of \$264,451 during the year to \$83,774,017 as of June 30, 1956. The four principal state trust funds totalled \$283,439,639 as compared with \$262,486,282 in 1955. Individual balances were as follows: internal improvement land \$394,401,881; swampland \$24,485,025.73; permanent school \$214,948,942.13; permanent university \$43,611,266.55.

Agriculture.—Minnesota farmers received \$1,247,344,000 during 1955 from crops, livestock and livestock products, thereby retaining the rank of fifth among states. Of this total cash income, \$846,495,000 came from the sale of livestock and livestock products, while the remainder of \$401,049,000 was derived from the sale of crops.

Manufacturing.—Minnesota's estimated manufacturing employment was 227,746 in Sept. 1956, a 3% increase over 1955. Weekly earnings averaged about \$79.94. Wages in manufacturing industries covered by unemployment

Table I.—Principal Crops of Minnesota

Crop	Indicated 1956	1955	Average, 1945-54
Corn, bu.	321,537,000	284,935,000	238,754,000
Oats, bu.	171,017,000	197,948,000	193,627,000
Barley, bu.	28,280,000	28,788,000	27,608,000
Wheat, bu.	16,599,000	12,186,000	18,579,000
Flaxseed, bu.	10,888,000	8,008,000	12,377,000
Potatoes, cwt.	11,183,000	8,268,000	8,839,000
Soybeans for beans, bu.	53,120,000	43,934,000	18,961,000
Hay, all, tons	7,691,000	7,100,000	6,243,000
Rye, bu.	1,410,000	1,725,000	2,204,000
Apples, bu.	256,000	323,000	197,000

Source: U.S. Department of Agriculture.

Table II.—Principal Industries of Minnesota

	All employees 1954	Salaries and wages 1954 (in 000s)	Value added by manu- facture 1954 (in 000s)	Value added by manu- facture 1953 (in 000s)
Food and kindred products.	49,575	\$199,002	\$400,307	\$356,578
Stone, clay and glass products	5,135	18,804	31,545	28,213
Primary metal industries	5,337	23,807	40,088	35,545
Fabricated metal products	9,831	41,363	73,089	88,182
Machinery (except electrical)	23,833	101,466	180,323	190,124
Electrical machinery.	6,675	27,875	48,739	45,640
Miscellaneous manufactures.	17,455	75,809	107,701	119,176

Source: U.S. Department of Commerce, 1954 Census of Manufactures, preliminary report.

Table III.—Mineral Production of Minnesota
(Short tons)

Mineral	Quantity	1953	Quantity	1954†
		Value		Value
Total		\$542,545,000		\$351,475,000‡
Clays	91,000	149,000	?	\$
Coke	862,000	15,363,000	804,000	17,952,000
Iron ore	90,198,000	517,851,000	54,447,000	319,632,000
Iron, pig	644,000	?	522,000	?
Manganiferous ore	1,091,000	?	504,000	\$
Sand and gravel	19,774,000	7,304,000	23,849,000	16,319,000
Stone	2,271,000	6,587,000	2,629,000	7,485,000
Other minerals . . . . .	...	10,654,000	...	8,206,000

*Values for processed materials are not included in the totals.

†Preliminary.

‡Total has been adjusted to eliminate duplication in the value of clays and stone.

\$Value included in other minerals.

Source: U.S. Bureau of Mines.

compensation totalled \$905,936,000 in 1955. Value added by manufacturing in 1954 was \$1,604,731,000.

Mineral Production.—Table III shows the tonnage and value of those mineral commodities produced in Minnesota in 1953 and 1954 whose value exceeded \$100,000. In 1954 Minnesota led the states in production of iron ore and was tenth in the value of its mineral output, with 2.52% of the total U.S. mineral output.

ENCYCLOPÆDIA BRITANNICA FILMS.—*Middle States*, 2nd ed. (1955).

Mint, United States: see COINAGE.

Miquelon: see FRENCH UNION; ST. PIERRE AND MIQUELON.

Missiles, Guided: see MUNITIONS.

Missions, Foreign (Religious). The slow but steady growth of the Christian churches in Japan continued in 1956, but less than 1% of the population was enrolled. In South Korea rapid increase in the numbers of Christians, both Roman Catholic and Protestant, continued, but it was accompanied by sharp divisions among the Presbyterians, the largest of the Protestant denominations. Nothing was heard of the Christians in North Korea. Some contact was resumed between the Protestants of China and the Christians of other countries. Bishop Manikam of a Lutheran church in India, and a recent secretary of the International Missionary council and the World Council of Churches, visited churches on the Chinese mainland; at the request of fellow bishops of the Anglican communion on the mainland, Bishop Hall of Hong Kong met with them in Shanghai; and Archbishop Mowll of the Church of England in Australia, and a former missionary in China, accepted an invitation to visit the mainland. In the summer of 1956 Bishop K. H. Ting of the Anglican communion in China attended several Christian gatherings in Europe. However, it appeared that the Protestant leaders in China did not wish resident missionaries; and the government continued to induce the Catholics to form a church independent of Rome. It also coerced small Protestant groups which dissented from that larger body of Protestants which co-operated with the Communist regime.

On Formosa a mass movement toward Christianity among the aborigines continued, and churches were growing among the Chinese who had come from the mainland.

Before the end of 1956 about two-thirds of the 1,200,000 Catholics in north Vietnam had migrated to south Vietnam to escape Communist rule, and their resettlement had been largely accomplished. In February and March 1956 important conferences were held in Bangkok, Thailand, by Protestants. One of them concerned theological education in southeast Asia. Difficulties were experienced in obtaining visas for missionaries, whether Catholic or Protestant, to enter Indonesia, Burma and India, and in India a report adverse to missions was made by a government commission which had been appointed to study the situation. Missionaries and churches in Egypt were disturbed by a government ruling which required instruction in Islam to Moslem pupils in Christian schools, provision in each of those schools for a mosque for Moslem worshippers and a holiday on Friday, the Moslem sacred week day.

In Africa south of the Sahara the striking growth persisted



AUCA INDIAN of Ecuador, a member of a primitive tribe that killed five evangelists in Jan. 1956. The photograph, taken by one of the missionaries, shows the model aeroplane and machetes given to the Aucas in an attempt to establish friendly relations

in the numbers of Christians, both Catholic and Protestant, which had been a feature of recent years. The Philippines and at least three countries in South America saw a phenomenal burgeoning of Pentecostal and Assemblies of God groups of varied origin. It was not new, but it was becoming more striking; and much group leadership was indigenous. Similar groups were multiplying in southern Italy.

The emphasis in Protestant circles upon theological education was maintained, and found expression not only in east and south-east Asia and Africa, but also in Madagascar. On a global scale, the World Council of Churches and the older International Missionary council, for several recent years in close co-operation, moved toward integration. If it were achieved, the International Missionary council would be absorbed by the World Council of Churches and the latter would give even more attention than formerly to the world-wide missionary enterprise. (K. S. L.)

Mississippi. A southern state of the U.S., admitted to the union in 1817, Mississippi is popularly known as the "Magnolia state." Area: 47,716 sq.mi. (47,248 sq.mi. land and 468 sq.mi. water): pop.: (1950 census) 2,178,914, (July 1, 1956 provisional est.) 2,124,000. Capital: Jackson (1950 est.) 98,271. Other cities of more than 20,000 population: Biloxi 37,425; Greenville 29,936; Gulfport 22,659; Hattiesburg 29,474; Laurel 25,038; Meridian 41,893; Natchez 22,740; Vicksburg 27,948. Of the state's population in 1950, 607,162 or 27.9% were urban.

History.—The elected officials of the state for 1956–60 were: governor, J. P. Coleman; lieutenant governor, Carroll Gartin;

retary of state, Heber Ladner; attorney general, Joe E. Patton; state treasurer, Robert D. Morrow; auditor of public accounts, E. B. Golding; superintendent of public education, W. L. Tubb; commissioner of insurance, Walter Dell Davis; state collector, William F. Winter (appointed to fill unexpired term on death of Mrs. Thomas L. Bailey in April); state land commissioner, Robert E. Graham; supreme court clerk, Tom Q. Hays.

From January to March 1956 the legislature passed all but one of Governor Coleman's many requested bills. His recommendations that failed were repeal of the "black market" liquor law (Mississippi is a legally dry state), a 30-day limit on special sessions, and an open door policy designed to admit the press to observe operation of all state agencies.

Governor Coleman vetoed a record 41 bills, including one forbidding investigations by the Federal Bureau of Investigation of civil rights violations, a bill to appropriate \$5,000 to buy white supremacy books, another to require that the white supremacy oath be taught in the schools, another to tighten libel laws and a bill that would have halted tax exemptions to churches hindering integration. Two important racial segregation bills were vetoed. One was a resolution of "interposition" stating that the state could interpose its laws to counteract the U.S. supreme court segregation decisions. The other bill set up a state sovereignty commission as a "watchdog group" to preserve segregation and to explain Mississippi's position to the nation. The highway bond was voted money to expand. A \$10,000,000 bond issue for colleges and universities put the state in debt for the first time in 24 years.

Some dissident Democrats and States Righters split from the party to put up their own slate of electors in November, pledged to elect U.S. Sen. Harry Byrd of Virginia for president and Rep. John W. Williams of Mississippi for vice-president. Mississippi Republicans also were divided. The "Lily White" faction walked out of the G.O.P. convention but returned later to share votes with the rival "Black and Tan" group. The rivals later split again to put separate groups of electors on the ballot.

Mississippi voted for Adlai E. Stevenson over Dwight D. Eisenhower, 144,498 to 60,685. Of the Republican votes, 4,313 were cast for the "Black and Tan" ticket. States Righters ranked third with 42,966 votes. The Republican vote was the largest in Mississippi's history. The state also approved a constitutional amendment to allow the legislature to set the same day for paying ad valorem taxes and buying auto tags.

Education.—In 1955-56 there were 769 white elementary schools in Mississippi and 1,563 Negro elementary schools, a total of 2,332. The enrollment in elementary schools was 449,576 of whom 212,241 were white and 237,335, Negroes. The state had 463 approved white high schools and 173 approved Negro high schools. The enrollment of these approved high schools and enrollments in nonaccredited schools gave a total enrollment of 96,418 in 1955-56. There were 10,200 elementary and high school teachers (including superintendents and principals), and 7,030 Negro elementary and high school teachers (including superintendents and principals), a total of 17,230 teachers. The total enrollment in white elementary and high schools was 775,744; in Negro elementary and high schools, 270,250.

Public Insurance and Assistance, Public Welfare and Related Programs.—In July 1, 1955, to June 30, 1956, the state department of public welfare in Mississippi paid \$24,119,870 to 78,976 recipients of old-age assistance; \$1,602,732 to 4,200 recipients of aid to the blind; \$3,800,417 to 69 families for aid to dependent children; and \$1,002,007 to 4,513 recipients of aid to the permanently and totally disabled. The state-county plan of foster home care for children maintained 484 children in 214 homes at a cost of \$132,320.14.

Communications.—As of June 30, 1956, the state maintained 8,289.5 mi. of highways; the counties maintained approximately 53,032.6 mi. In the year 1955-56 the state maintenance expenditures were estimated at \$1,220,50. The maintenance expenditures on county highways were \$50,514.49. The total mileage of railroads in the state on Dec. 31, 1955, was 3,838.28.

Banking and Finance.—On June 30, 1956, there were 170 state banks in Mississippi with 26 branch banks and 62 branch offices; there were 27 national banks. The resources of state banks were \$748,636,741.55 and the deposits were \$683,545,024.80; the resources of the national banks were \$292,579,464.14 and the total deposits were \$268,541,013.56. As of June 30, 1956, there were no bonds against the full faith and credit of the state of Mississippi and the highway bonds payable from the gasoline

Table I.—Principal Crops of Mississippi

Crop	Indicated 1956	1955	Average, 1945-54
Cotton (500-lb. bales)	1,685,000	2,023,000	1,656,000
Corn, bu.	37,125,000	48,420,000	38,998,000
Hay, tons	876,000	1,038,000	904,000
Oats, bu.	14,663,000	12,030,000	7,792,000
Potatoes, cwt.	370,000	390,000	453,000
Sweet potatoes, cwt.	800,000	1,265,000	1,178,000
Soybeans, bu.	10,514,000	11,894,000	3,907,000
Pecans, lb.	13,100,000	10,000,000	7,985,000
Peaches, bu.	447,000	*	510,000
Pears, bu.	107,000	5,000	186,000
Rice (100-lb. bags)	1,260,000	1,482,000	869,000

*Less than 500 bu.

Source: U.S. Department of Agriculture.

Table II.—Principal Industries of Mississippi

Industries	All employees 1954	Salaries and wages 1954 (in 000s)	Value added by manu- facture 1954 (in 000s)	Value added by manu- facture 1953 (in 000s)
Food and kindred products	\$11,023	\$25,959	\$60,333	\$ *
Textile mill products	5,221	12,383	16,062	15,557
Apparel and related products	18,833	34,915	51,909	47,996
Lumber and products (except furniture)	21,494	42,675	71,791	95,011
Paper and allied products	8,186	32,589	85,131	76,953
Stone, clay and glass products	2,515	7,923	19,402	19,854

*Withheld because the estimate did not meet publication standards, either on the basis of the associated standard error of estimate or on the basis of a consistency review.
Source: U.S. Department of Commerce, 1954 Census of Manufactures, preliminary report.

tax amounted to \$69,546,000 as of the same date. The total receipts for the state of Mississippi for the year ended June 30, 1956 were \$200,731,239.36 and the total expenditures of the state for that fiscal year were \$193,942,551.51.

Agriculture.—The 1954 census reported 215,915 farms of a total 20,702,412 ac. In 1955 the total harvested acreage of principal crops was 5,333,000 ac. In 1955 receipts from farm marketings were \$554,119,000 of which \$402,014,000 were from crops and \$152,105,000 were from livestock products; the value of farm products consumed in farm households was \$79,568,000.

Manufacturing.—Mississippi gained 13 new industries in 1956 through Nov. 6, employing a total of 2,715 people. (A. B. Bu.; W. D. B.)

Mineral Production.—Table III shows the tonnage and value of those mineral commodities in 1953 and 1954 whose value exceeded \$100,000. In

Table III.—Mineral Production of Mississippi

(In short tons, except as noted)				
Mineral	1953		1954*	
	Quantity	Value	Quantity	Value
Total		\$107,868,000		\$110,563,000†
Clays	560,000	3,158,000	559,000	3,103,000
Natural gas (000 cu.ft.)	154,254,000	12,340,000	140,448,000	11,657,000
Natural gasoline (000 gal.)	32,214	2,295,000	28,000	1,944,000
Petroleum (bbl.)	35,620,000	84,060,000	34,240,000	85,600,000
Petroleum gases (000 gal.)	17,724	713,000	15,000	528,000
Sand and gravel	2,654,000	2,174,000	5,442,000	4,287,000
Stone	38,000	44,000	91,000	181,000
Other minerals . . . . .	...	3,084,000	...	3,353,000

*Preliminary. †Total has been adjusted to eliminate duplication in the value of clays and stone.

Source: U.S. Bureau of Mines.

1954, Mississippi was second among the states in output of bentonite (14%) and ranked 25th in the value of its mineral value, with 0.79% of the U.S. total.

ENCYCLOPEDIA BRITANNICA FILMS.—*Southeastern States*, 2nd ed. (1956).

Missouri. A west north central state of the United States, popularly known as the "Show Me" state. Area: 69,674 sq.mi., of which 448 sq.mi. are water. Pop.: (1950 census) 3,954,653 (61.5% urban, 38.5% rural; 90.2% white, 9.8% nonwhite); (July 1, 1956, est.) 4,255,000.

Capital: Jefferson City (1950 census) 25,099. Largest cities (1950 census): St. Louis 856,796; Kansas City 456,622; St. Joseph 78,588; Springfield 66,731; University City 39,892; Joplin 38,711; Independence 36,963.

History.—On Jan. 24, 1956, a constitutional amendment was approved by the voters providing for a \$75,000,000 bond issue, the proceeds to be used for repairing and rebuilding present state buildings and for new construction of the penal and correctional institutions, mental hospitals and institutions of higher learning.

The 68th general assembly convened in extra session on Feb. 27, 1956, and adjourned on April 27, 1956. It appropriated and allocated the \$75,000,000 authorized by the constitutional

amendment adopted on Jan. 24, 1956. The assembly also proposed an amendment to the constitution, to be submitted to the voters on Nov. 6, 1956, authorizing the investment of state funds not needed for current operating expenses in short term U.S. obligations or interest-bearing time deposits.

In the general election on Nov. 6, 1956, the popular vote for president gave Adlai E. Stevenson a narrow margin over Dwight D. Eisenhower, 919,000 to 914,000. The vote for U.S. senator was Thomas C. Hennings, Jr. (Dem., incumbent), 1,015,936, Herbert Douglas (Rep.) 785,048. Ten Democrats and one Republican were elected to the U.S. house of representatives.

In the same election James T. Blair, Jr. (Dem.), defeated Lon Hocker (Rep.) for governor by more than 75,000 votes. The other state officers elected were also Democrats: Edward V. Long, lieutenant governor; Walter H. Toberman (incumbent), secretary of state; M. E. Morris, treasurer; and John M. Dalton (incumbent), attorney general. Haskell Holman (Dem.), state auditor, who was elected in 1954, continued in that office; the election for state auditor would not be held until 1958.

As a result of the election on Nov. 6, 1956, both houses of the state legislature continued Democratic, the house of representatives consisting of 93 Democrats and 64 Republicans, the senate of 21 Democrats and 13 Republicans. The voters also approved the constitutional amendment proposed in the extra session of the 68th general assembly.

Education.—For the school year ended June 30, 1956, the public school system consisted of 2,001 districts operating elementary schools (excluding kindergarten), with 539,060 pupils and 18,256 teachers; 574 districts operating secondary schools, with 167,729 pupils and 7,317 teachers. Hubert Wheeler was state commissioner of education.

On Nov. 30, 1956, 17,799 veterans were enrolled in universities, colleges and other schools in the state, 2,318 were receiving training on the farm and 1,449 were taking on-the-job training.

Social Insurance and Assistance, Public Welfare and Related Programs.—For the year ended June 30, 1956, unemployment insurance totalled \$20,780,094, paid to about 105,034 persons. For the year ended June 30, 1956, old-age assistance amounted to \$78,220,706, aid to dependent children \$17,051,415, general relief \$3,118,375, pensions for the blind \$256,487, aid to the blind \$2,918,880 and aid to the disabled \$8,361,923. In June 1956, 129,248 persons received old-age assistance, 20,383 families (54,406 children) aid to dependent children, 9,164 general relief, 342 blind pensions, 4,456 aid to the blind and 13,367 aid to the disabled.

During the year ended June 30, 1956, the state penitentiary had an average of 3,427 inmates per day, the intermediate reformatory (Alcoa) 525; and the expenditures of these institutions amounted to \$3,096,767. For the year ended June 30, 1956, the three state training schools (Boonville, Chillicothe and Tipton) had an average population of 333 boys (white) and 130 girls (106 white, 24 Negro); and for the same period their expenditures totalled \$742,072, in addition to \$89,371 for the office of the state director and placement department of the training schools. On Sept. 1, 1956, the training school for girls (white) at Chillicothe and the training school for girls (Negro) at Tipton were combined on one campus—the training school for girls at Chillicothe.

Communications.—On Dec. 31, 1956, Missouri had 24,115 mi. of state highways and 74,778 mi. of rural roads. During 1955 the state highway commission spent \$105,062,085 (state and federal funds), of which \$71,592,790 was for construction and \$18,026,858 for maintenance. Early in 1955 railroad mileage totalled 6,732. On Dec. 21, 1956, there were 102 public airports. There were 1,464,679 telephones in use on Dec. 31, 1956.

Banking and Finance.—On June 30, 1956, Missouri had 509 state banks with deposits of \$2,799,272,000 and resources (loans and investments) of \$2,635,455,000; 76 national banks with deposits of \$1,611,704,000 and resources (loans and investments) of \$1,589,530,000. On June 30, 1956, there were 117 state chartered savings and loan associations with resources of \$476,703,797, and 40 federal savings and loan associations with resources of \$483,584,103.

During the fiscal year ended June 30, 1956, receipts in all state funds totalled \$388,381,232, plus transfers of \$141,522,418; disbursements, \$385,686,411. General revenue receipts for the same period were \$161,436,775, of which \$99,582,192 was derived from the sales tax and \$35,389,808 from the income tax. On June 30, 1956, the balance in the state treasury was \$145,946,182. The state debt (road bonds) on July 1, 1955, was \$6,500,000, and on June 30, 1956, \$3,000,000.

Agriculture.—During 1955 cash income from crops and livestock was \$932,614,000 and cash income from government payments was \$8,831,000. The value of Missouri's 1955 crops, harvested from 13,550,000 ac., was \$608,736,000; the value of the 1956 crops was estimated at \$662,916,000. During 1956 the production of corn was the largest since 1948, the production of wheat the largest since 1919 and the production of soybeans the largest on record. The seed and hay crops were reduced by the 1956 drought.

Manufacturing.—The average number of persons employed in manufacturing industries in 1953 was 405,061, an increase of 26,803 over 1952 (revised figures). Salaries and wages in 1953 totalled \$1,552,445,000; in

Table I.—Principal Crops of Missouri

Crop	Indicated 1956	1955	Average 1945-54
Corn, bu.	189,408,000	162,720,000	141,798,000
Wheat, bu.	49,800,000	48,081,000	27,976,000
Hay, all, tons	3,523,000	4,010,000	4,190,000
Cotton, bales	450,000	410,000	362,000
Oats, bu.	42,129,000	50,976,000	36,203,000
Soybeans, bu.	39,120,000	33,250,000	20,616,000
Barley, bu.	11,826,000	15,428,000	2,510,000
Rye, bu.	765,000	1,050,000	491,000
Tobacco, lb.	3,600,000	3,840,000	5,634,000
Potatoes, Irish, bu.	1,166,666	1,185,166	1,396,666
Potatoes, sweet, bu.	201,666	183,333	250,000
Sorghum for grain, bu.	5,610,000	2,511,000	667,000
Apples, bu.	465,000	520,000	1,125,000
Peaches, bu.	350,000	231,000	601,000
Pears, bu.	45,000	50,000	146,000
Grapes, tons.	3,200	2,500	3,000

Source: U.S. Department of Agriculture.

Table II.—Principal Industries of Missouri

Industries	All employees 1954	Salaries and wages 1954 (in 000s)	Value added by manufacture 1954 (in 000s)	1955
Food and kindred products	54,837	\$220,353	\$460,009	\$433,100
Apparel and related products	35,417	90,711	148,461	145,400
Pulp, paper and products	11,031	40,864	71,491	60,700
Printing and publishing industries	22,128	93,098	146,033	—
Chemicals and allied products	18,271	81,300	233,418	227,300
Leather and leather products	37,408	93,792	173,562	169,800
Stone, clay and glass products	14,069	60,761	120,711	112,800
Primary metal industries	12,720	53,620	87,672	92,500
Fabricated metal products	24,567	103,573	177,641	198,200
Machinery (except electrical)	24,353	105,040	179,050	179,700
Electrical machinery	22,699	95,205	158,309	128,900
Transportation equipment	46,084	214,319	490,040	509,500

Source: U.S. Department of Commerce, Annual Survey of Manufactures, 1953 and 1954 (preliminary).

Table III.—Mineral Production of Missouri

Mineral	Value 1955	Value 1954	Value 1953
Barite	\$ 4,003,842	\$ 3,047,436	\$ 3,338,300
Cement	34,912,186	31,425,190	26,238,400
Clays (except for cement)	6,383,972	5,403,698	10,850,400
Bituminous coal	12,771,570	10,028,293	9,848,900
Copper	1,175,977	1,135,750	1,362,600
Lead	37,422,941	34,318,500	32,984,400
Lime	14,408,279	11,165,381	12,084,100
Sand and gravel	9,727,092	10,203,481	5,233,900
Silver	243,115	319,457	325,600
Stone*	31,250,757	24,751,610	19,908,500
Zinc	1,101,096	1,125,360	2,295,500

*Total, including limestone for cement and lime.

Source: U.S. Bureau of Mines, Region IV, Jan. 1957.

1952 (revised figures), \$1,360,676,000. The value added by manufacture of products in 1953 totalled \$2,786,829,000, compared with \$2,422,709,000 in 1952 (revised figures).

Mineral Production.—The estimated total value of all mineral production in Missouri for 1956 was \$159,235,000. The total value of all mineral production in the state for 1955 was \$151,073,022, for 1954, \$130,392,000, and for 1953, \$128,297,000. (R. P. Br.)

ENCYCLOPÆDIA BRITANNICA FILMS.—Middle States, 2nd ed. (1955).

Mitchell, James Paul (1900—), U.S. government official, was born at Elizabeth, N.J., on Nov. 12. He attended New York university but did not graduate, beginning work instead with the Western Electric company at Kearny, N.J., and becoming personnel manager of the company in 1936. Later he was named a special labour adviser to the director of the Works Progress administration in New York state, and from 1942 to 1945 he was director of the U.S. army service forces' division of industrial personnel in Washington, D.C. He then returned to private business, as director of personnel and industrial relations for R. H. Macy & Co., New York city department store. In 1947 he was elected vice-president of Bloomingdale Brothers department store in New York city. On April 6, 1953, Pres. Dwight D. Eisenhower appointed Mitchell assistant secretary of the army in charge of manpower and reserve affairs. On the following Oct. 8 Eisenhower named him secretary of labour.

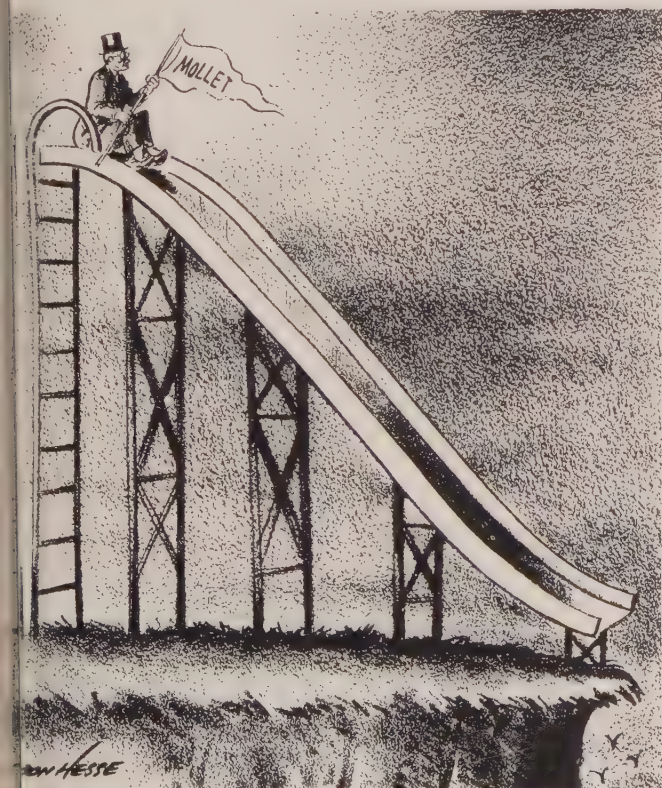
In a speech before the annual convention of the American Federation of Labor at Los Angeles, Calif., on Sept. 20, 1955, Mitchell berated the A.F. of L. for its failure to make "an objective appraisal of the Eisenhower administration's achievements" in behalf of U.S. labour. Relations between Mitchell and the A.F. of L. and the Congress of Industrial Organizations were somewhat strained thereafter. On Feb. 1, 1955, the A.F. of L.

Executive council accused him of tolerating violations of minimum wage rates on government construction projects—a charge Mitchell promptly denied. Mitchell also urged a 90-cent hourly national minimum wage, against the \$1.25 minimum asked by F. of L. and C.I.O. officials.

He opposed federal intervention in the national steel strike the summer of 1956.

Mohammedanism: see ISLAM.

Mollet, Guy Alcide (1905–), French statesman, was born at Flers, Orne, Dec. 31. He joined the Socialist party in 1921 and in 1932 was elected secretary of the Fédération de l'Enseignement, a Socialist teachers' trade union. At that time he was teacher of English at the Arras lycée. Mobilized in Aug. 1939, he was wounded and made prisoner of war in June 1940 and repatriated in Feb. 1942. He engaged in resistance activities and at the end of World War II emerged as captain of the F.F.I. (French forces of the interior). In 1945 he was elected mayor of Arras and in Sept. 1946 became secretary-general of the French Socialist party. He was elected to the constituent assembly of 1945 and 1946 and from Nov. 1946 sat in three successive national assemblies. He was minister of state in the Léon Blum cabinet (Dec. 1946-Jan. 1947) and in the René Plevin cabinet (July 1950-March 1951). He failed to form a government in March 1951 and served as deputy premier in the Henri Queuille cabinet (March-July 1951). On Jan. 31, 1956, he formed a coalition cabinet of Socialists and Radicals. In May he visited Moscow, and on June 5, at Luxembourg, he signed with Konrad Adenauer, Federal German chancellor, an agreement on political integration of the Saar with the German Federal Republic. After the seizure of the Suez canal in July, he denounced Pres. Gamal Abdel Nasser of Egypt as an imitator of Hitler. On Sept. 10–11, after the failure of the Eisenhower mission to Cairo, he conferred in London with Sir Anthony Eden. He was again in London on Oct. 30, when an Anglo-French ultimatum was sent to Cairo.



"CHANGE SEATS A NEW PREMIER," a 1956 cartoon by Hesse of the St. Louis Globe-Democrat (Mo.)

Molybdenum: see MINERAL AND METAL PRODUCTION AND PRICES.

Monaco. A sovereign principality on the Mediterranean coast, 9 mi. E. of Nice, Monaco is bounded on all land sides by the French département of Alpes-Maritimes and united to France by customs union. Area: 0.6 sq.mi. Pop. (1956 census): 20,422, including 2,696 Monegasques, 11,209 French, 4,490 Italians, 655 British and 1,372 others, wholly divided between the three communes Monaco-Ville, Monte Carlo and La Condamine. Language: French. Religion: Roman Catholic. Sovereign, Prince Rainier III; minister of state, Henri Soum, a French civil servant; president of the national council, Louis Aureglia.

History.—The historic event of 1956 was the marriage of Prince Rainier to Grace Kelly, the U.S. film actress. The civil wedding took place on April 18 and the religious ceremony the following day, in the Roman Catholic cathedral of St. Nicholas in Monte Carlo. The marriage was solemnized by the bishop of Monaco, Msgr. Barthé, in the presence of the papal legate to France and representatives of 24 countries. Guards of honour were provided by the Monegasque army (160 men) and by detachments from the British, French, Italian and U.S. navies.

The public interest in the wedding was great; journalists alone, from all over the world, numbered 1,380. This overwhelmed the palace and its public relations officers. Special stamps of eight values were issued and were on sale for one day only: April 19.

After the religious ceremony Prince Rainier and Princess Grace Patricia left Monaco in their honeymoon yacht, the "Deo Juvante II." They came ashore at Pollensa, Majorca, on April 22. On May 12 they were in Madrid, where Gen. Francisco Franco invited them to lunch at El Pardo palace. They returned to Monaco at the end of May, and on Sept. 11 they arrived in New York, remaining in the United States until November. In August it was announced that Princess Grace was expecting a baby.

Finance.—Budget (1954 est.): revenue 2,121,371,000 fr.; expenditure 2,512,555,000 fr.

Monetary Units: see EXCHANGE CONTROL AND EXCHANGE RATES.

Money Markets: see BANKING.

Mongolian People's Republic. This people's republic of eastern Asia is bounded north by the U.S.S.R. and east, south and southwest by China. Area (1954 Soviet est.) 591,119 sq.mi. Pop. (1956 est.; no census ever taken): 1,000,000. Language: Mongol. Religion: Lamaistic Buddhism. Capital: Ulan Bator, pop. (1956 est.) 120,000. First secretary of the Mongolian People's Revolutionary (Communist) party in 1956, D. Damba; chairman of the presidium of the great khural, Z. Sambu; chairman of the council of ministers, Yumzhaghiyin Tsedenbal.

History.—A. I. Mikoyan, first vice-chairman of the Soviet council of ministers and a member of the presidium of the Communist party of the Soviet Union, visited Mongolia in April 1956. Negotiations were conducted in Ulan Bator between representatives of the Soviet and Mongolian governments on "the further consolidation of the economic relations between the two countries."

An agreement was signed by Mikoyan and Tsedenbal on assistance during 1956–60 by the U.S.S.R. to Mongolia in building houses in Ulan Bator with a total domestic floor space of 430,500 sq.ft. It was decided to transfer to Mongolia the Soviet-Mongolian joint stock company, the Ulan Bator railway, as well as the narrow-gauge railways Solovyevsk-Bayan-Tumen and Choibalsan-Tamtsak-Bulak, with all service buildings, installations and rolling stock.

In August it was announced in Peking that Communist China had given Mongolia a grant-in-aid of 160,000,000 tugriks for the construction of a textile factory, a glass factory and a paper mill, as well as roads, bridges and other public works. More than 10,000 Chinese came to Mongolia in 1955 to help fill manpower needs in industry, agriculture and building construction.

For the first time a U.S. correspondent, Jack Raymond of the *New York Times*, and Lisa Larsen, a *Life* magazine photographer, were granted visas to visit Mongolia in August. Mongolian officials confirmed to them that more than 25 years earlier forced collectivization of herdsmen, who comprise 75% of the population, had been abandoned by the regime. Only 20% of the great herds of horses, cattle, camels, yaks, sheep and goats, totalling 27,000,000 head, had been included under the collectivization program.

Mongolia applied for membership of the United Nations but its application failed to find support of the Security council.

Education.—Schools (1953): primary 377, higher primary 31, secondary 24, vocational 16, pupils (all schools) 80,000. Teachers' training colleges 3; secondary teachers' training institute at Ulan Bator. Mongolian State university at Ulan Bator with 1,300 students.

Finance.—Budget (1953): balanced at 436,700,000 tugriks; three-quarters of expenditure invested in national economy and cultural development. Monetary unit: tugrik at par with the Soviet rouble.

Transport and Communications.—Railways (1956): about 1,180 mi. Highways (1955): about 3,000 mi.

Economy.—Livestock (1955): more than 22,000,000 head of cattle, sheep, horses and camels. Coal extraction at the Nalaikha basin (1953): about 300,000 metric tons.

Montana. A northwestern state of the United States, popularly known as the "Treasure state," Montana was admitted to the union on Nov. 8, 1889, as the 41st state. It is the largest of the northwestern states and the third largest in the United States, with an area of 147,138 sq.mi., including a water area of 1,260 sq.mi. The population by the 1950 official census was 591,024. The urban population was 258,034 or 43.7% compared with 37.8% in 1940. Of the state's total population, 572,038 or 96.8% were white, of whom 528,919 were native-born. Other racial groups totalled 18,986, with 16,606 Indians and 1,232 Negroes. The July 1, 1956, U.S. bureau of the census estimate of population was 638,000. The population of the principal cities (1950 census) was: Helena, the capital 17,581; Great Falls 39,214; Butte 33,251; Billings 31,834; Missoula 22,485; Bozeman 11,325; Anaconda 11,254; Kalispell 9,737; Miles City 9,243; Havre 8,036.

History.—Incumbents in the principal elective state offices, whose terms were to expire in Jan. 1957, were: J. Hugo Aronson (Rep.), governor; George M. Gosman (Rep.), lieutenant governor; S. C. Arnold (Rep.), secretary of state who was appointed by Governor Aronson in June 1955 for the unexpired term of Sam W. Mitchell (Dem.); Arnold H. Olson (Dem.), attorney general; Edna Hinman (Rep.), treasurer; John J. Holmes (Dem.), auditor; Mary M. Condon (Dem.), superintendent of public instruction.

The Montana legislature regularly meets only in odd-numbered years and there was no session in 1956. A second "Little Hoover commission" set up by the legislative assembly in 1955 was given an appropriation of \$40,000 and charged primarily, in the light of rising expenditure demands, to study the state's tax structure during the interim between the 1955 and 1957 sessions. The 12-member commission, six senators and six representatives, was quickly organized, held a number of preliminary meetings, and asked that all types of industries and trade organizations present their tax studies. Payment of the commission's travel expenses, however, was blocked by the attorney general and the secretary of state, who constituted a majority of the three-man board of examiners, and a district court order was secured preventing the state auditor from processing claims against the commission's \$40,000 appropriation. After struggling unsuccessfully for a year

to begin its job, the commission was declared unconstitutional by the Montana supreme court by a vote of three to two.

The controversial oil and gas lease law permitting oil and gas leases on state lands "for a primary period of 10 years, and as long thereafter as oil and gas in paying quantities shall be produced thereunder," received increasing attention as the 1956 political campaign progressed. Enacted by almost unanimous majorities of both houses of the legislative assembly in 1953, this law was attacked by the attorney general as a "give away law" and was declared unconstitutional by the Montana supreme court by a vote of three to two, on the ground that it violated the federal enabling act under which Montana became a state. The case was then appealed to the United States supreme court, which reversed the Montana supreme court decision. According to Montana law, money from oil and gas leases and bonuses is used for the public schools and stoppage of this source of revenue during the two-year period of court litigation resulted in a loss of from \$5,000,000 to \$10,000,000 for the state school fund.

In the Nov. 1956 general election, Montana gave its electoral votes to Pres. Dwight D. Eisenhower. The following were elected to the principal state offices: governor, J. Hugo Aronson (Rep.) (re-elected); lieutenant governor, Paul Cannon (Dem.); secretary of state, Frank Murray (Dem.); attorney general, Forrest H. Anderson (Dem.); treasurer, Horace F. Casey (Dem.); auditor, John J. Holmes (Dem.) (re-elected); superintendent of public instruction, Harriet Miller (Rep.). A constitutional amendment prohibiting the use of money raised for highways for any other purpose was approved by the voters.

Education.—During the school year 1955-56 there were 1,210 public elementary schools in the state with 4,064 teachers and an enrolment of 94,267 pupils. The number of public high schools was 176 with 1,701 teachers and 31,403 students. The total cost of operating public elementary and secondary schools for the fiscal year 1955-56 was \$40,106,405, not including expenditures of \$9,351,091 for capital outlay, and \$6,517,208 for debt service. In addition to the public schools, there were 61 private elementary schools with 346 teachers and 12,736 pupils, and 18 private high schools with 178 teachers and 3,074 students.

Social Insurance and Assistance, Public Welfare and Related Programs.—Approximately 20,000 persons received public assistance in Montana during the fiscal year 1955-56. Grants totalling \$12,503,320 were distributed as follows (figures in parentheses indicate the average number of recipients per month): old-age assistance (8,818) \$6,131,975; aid to dependent children (families 2,001, children 5,357) \$2,539,349; aid to needy blind (436) \$340,551; aid to disabled (1,429) \$1,104,665; general assistance (806) \$346,441; medical care \$476,935; hospitalization \$1,489,145; burial \$74,259. Unemployment benefits of \$3,869,687 were paid to 16,949 persons an average of \$23.58 per week for 12.12 weeks, or \$267.11 per claimant. Correctional institutions with their average populations and total expenditures for 1955-56 were: Montana state prison, 567 inmates, \$437,850; state industrial school, 113 inmates, \$246,267; vocational school for girls 56 inmates, \$123,874.

Communications.—As of July 1, 1956, the total road mileage of Montana was 72,925, of which 9,944 mi. were classified as state highways. The local road system, rural and municipal, totalled 62,981 mi. with 14,250 mi. surfaced with oil or gravel. During the fiscal year 1955-56 the state highway commission spent \$29,339,694, including federal aid funds, of which \$19,039,768 was for construction and \$10,299,926 for maintenance and administration. Municipal, military and forest service airports totalled 139, and there were 320 privately owned airfields used by farmers and ranchers within the state. There were 1,093 registered aircraft, and 1,471 registered air pilots. Motor vehicle registrations on Aug. 31, 1956, amounted to 221,869 passenger cars, 94,984 trucks and 22,086 trailers. The railway mileage was 5,241. The number of telephones, including 23,600 for Rural Electrification administration and connecting companies, was 200,530. There were 81 weekly newspapers and 15 dailies.

Banking and Finance.—Montana's 113 state and national banks reported total resources of \$722,603,288 on June 30, 1956, compared with \$696,393,811 on June 30, 1955. The resources of the 73 state banks were \$364,397,521 and their deposits were \$323,265,402. Resources for the 4 national banks totalled \$358,205,767, with deposits of \$335,149,819. During the fiscal year Montana banks increased loans throughout the state by \$43,000,000. Building and loan associations numbered 15 with resources of \$52,267,836, a growth of 310% since World War II, and a gain of \$6,285,932 over the previous year. For the fiscal year 1955-56 treasury receipts for the state totalled \$112,438,087 and disbursements \$109,243,111. The state's bonded debt on Aug. 1, 1956, was \$37,780,000 as compared with \$36,780,250 a year before.

Agriculture.—The 1956 agricultural outlook for Montana was grim during the first part of the growing season, because of continued cold and dry weather. The prospect brightened somewhat when rainfall in July measured a little above normal for the state as a whole, but this was insufficient to promote recovery of crops injured by dryness in large areas of central and eastern Montana. Forecasts by the U.S. department of agriculture

Table I.—Principal Crops of Montana

Crop	Indicated 1956	1955	Average 1945-54
wt. bu.	74,749,000	109,350,000	80,798,000
tons	2,719,000	3,054,000	2,641,000
y, bu.	27,710,000	41,370,000	18,355,000
beets, tons.	740,000	724,000	709,000
bu.	6,462,000	10,840,000	9,290,000
pes, cwt.	1,358,000	1,350,000	1,319,000
bu.	2,736,000	3,999,000	2,586,000
dry (100-lb. bags)	192,000	217,000	203,000
ed, bu.	648,000	672,000	650,000
dry (100-lb. bags)	69,000	61,000	112,000
bu.	99,000	340,000	176,000

Source: U.S. Department of Agriculture.

are indicated a smaller yield than in 1956 for all of the crops of Montana, with the exception of potatoes, and in the majority of cases even lower yields than for the ten-year average 1945-54.

Manufactures.—The total value added by manufacture (preliminary report 1954 census of manufactures) in approximately 873 manufacturing plants in the state was \$141,222,000, compared with \$142,045,000 in 1953 and \$138,952,000 in 1952. Estimates of the Montana unemployment compensation commission indicated that manufacturing industries employed an average of 21,100 wage earners during the fiscal year 1955-56, a gain of

Table II.—Industrial Products of Montana

Products	1955	1954	1953
Can cheese, lb.	3,600,000	4,450,000	4,005,000
ge cheese, lb.	1,445,000	1,255,000	...
lb.	5,910,000	6,370,000	6,616,000
am, gal.	2,530,000	2,465,000	2,930,000
rozen dairy desserts, gal.	437,000	338,000	...
ugar, cwt.	2,241,587	2,038,666	1,806,025
tbl.	230,965	299,088	217,805
ine, gal.	294,124,781	295,919,407	271,485,695
power generated, kw.hr.	5,211,010,000	4,616,507,000	3,750,235,000

from the preceding year. Salaries and wages of these employees totaled \$95,908,843 as compared with \$81,208,586 for 1954-55. The average monthly employment for all Montana, excluding agriculture, during the period was 162,500. Manufacturing payrolls represented 7.8% of aggregate incomes in Montana in 1955 as compared with 23.8% nationally, and leaves the state one of the lowest in the nation in percentage growth in manufacturing employment. (E. E. R.)

Mineral Production.—Table III shows the tonnage and value of those minerals produced in 1953 and 1954 whose value was \$100,000 or more. In 1954 Montana was second among the states in chromite, manganese and output, third in silver (since 1943), fourth in fluorspar, phosphate

Table III.—Mineral Production of Montana

(Short tons, except as noted)

Mineral	1953		1954†	
	Quantity	Value	Quantity	Value
ite	26,000	\$132,184,000	123,000	\$126,279,000
ate	1,873,000	870,000	1,491,000	4,132,000
or	78,000	4,978,000	59,000	4,157,000
z.	25,000	44,552,000	24,000	35,016,000
ne	20,000	867,000	15,000	828,000
inese ore.	113,000	5,227,000	59,000	4,061,000
ill gas (thousand cu. ft.)	27,889,000	1,645,000	30,252,000	2,057,000
ill gasoline (bbl.)	?	?	?	?
rum (bbl.)	11,920,000	26,020,000	14,195,000	31,230,000
rum gases (bbl.)	?	?	?	?
late rock	?	?	?	?
nd gravel	6,203,000	2,994,000	13,341,000	7,460,000
oz.)	6,690,000	6,054,000	5,178,000	4,686,000
ine	803,000	1,125,000	1,320,000	1,385,000
ine	80,000	18,462,000	61,000	13,166,000
minerals . . . . .	...	19,390,000	...	18,101,000

†Value included with other minerals.

†Preliminary.

Source: U.S. Bureau of Mines.

and lead output and fifth in copper output. It ranked 24th in the output of its mineral output, with 0.9% of the U.S. total.

ENCYCLOPEDIA BRITANNICA FILMS.—*Montana* (1955); *Northwestern Montana* (1956).

Montreal. A city in the province of Quebec and metropolis of Canada, Montreal was founded in 1642 as Ville Marie. The 1951 census gave the city proper a population of 1,035,200 (1955 est., 1,080,000) and that of greater Montreal 2,440,000 (1955 est., 1,565,000).

The port of Montreal is the largest in Canada. Deep-sea anchorage (commercial) during 1955 numbered 1,905 with a net tonnage of 5,492,538. Coastal and inland commercial traffic including fishing vessels totalled 3,288 ships of 3,629,759 tons. A total of 2,542 scheduled air operations took place at Dorval airport, including 43,359 commercial air-line arrivals and the same number of departures.

The assessed value of real estate in fiscal 1955-56 was \$2,099,264,466, of which \$1,671,166,486 was taxable. During 1955, 8,416 building permits were issued for new buildings. Enrolment in public schools during 1954-55 was: Protestant 20,904, Catholic 111,122.

The principal developments of the year in Montreal were linked to massive building projects. Housing schemes and new buildings in all sections of the city were expanding the metropolitan area and giving the central districts a changed look. Traffic had been greatly improved by various measures including new streets and street-widening projects, but principally by the elimination of streetcars in main arteries. Streetcars were expected to vanish completely from the city by the end of 1956. The new municipal government had concentrated on traffic problems, and there had been progress in slum clearance and a long-promised concert hall-theatre building.

A much-needed new air-line terminal at Dorval airport was also under long-term construction, as was the new hotel for the Canadian National railways.

A building development was under way which when completed was expected to result in a project equivalent to New York city's Rockefeller Center.

The biggest construction job locally was the Lachine section of the St. Lawrence Seaway development, which was halfway to completion. The total budget for the entire Canadian section of the seaway was \$300,000,000, with the local Montreal section costing \$120,000,000 plus \$50,000,000 for the nearby Beauharnois power project.

(See also MUNICIPAL GOVERNMENT.)

(F. A. C.)

ENCYCLOPEDIA BRITANNICA FILMS.—*Industrial Provinces of Canada* (1943).

Montserrat: see LEEWARD ISLANDS.

Moose, Loyal Order of: see SOCIETIES AND ASSOCIATIONS, U.S.

Moral Re-Armament, World Assembly for: see WORLD ASSEMBLY FOR MORAL RE-ARMAMENT.

Mormons. During 1956, the Church of Jesus Christ of Latter Day Saints continued advances on a number of fronts. The temple at Los Angeles, Calif., was completed. The California state legislature passed resolutions conveying to the officials and members of the church congratulations upon the completion and dedication of the temple and commending the church and its people upon the contributions made to the progress of the commonwealth of California.

The church continued its enlarged building program. There were 568 buildings under construction or being remodelled, including 70 in the south sea islands. During the year, 100 chapels were completed and dedicated. Construction of the temple in Great Britain was begun.

The first baccalaureate service of the church school in Hawaii was held in the spring.

Members of the Council of the Twelve Apostles made special church missionary tours: Elder Henry D. Moyle in South America and Elder Adam S. Bennion in Europe. The Relief society of the church completed and dedicated a central office building in Salt Lake City, Utah, building costs being contributed in considerable part by members of the society. Active membership of the society was more than 163,500; about 133,258 were in the stakes of the church (mostly in the United States), and about 30,285 in the missions of the church (both in the United States and in foreign countries).

The missionary work of the church was pushed forward in the United States, Europe, South Africa, the near east, the far east, the Latin-American countries and the Pacific islands. (See also CHURCH MEMBERSHIP.) (J. R. CL.)

Morocco. An independent sultanate of northwest Africa, with both Mediterranean and Atlantic coast lines, Morocco was divided until 1956 into French Morocco, Spanish Morocco (see SPANISH COLONIAL EMPIRE) and the international zone of Tangier (*q.v.*). Areas and populations are shown in the table.

	Area (sq.mi.)	Population (1955 est.)
French Morocco	154,054	8,470,000
Spanish Morocco†	20,364	1,157,297
Tangier	135	183,000
Total	174,471	9,668,995

*1950 census.

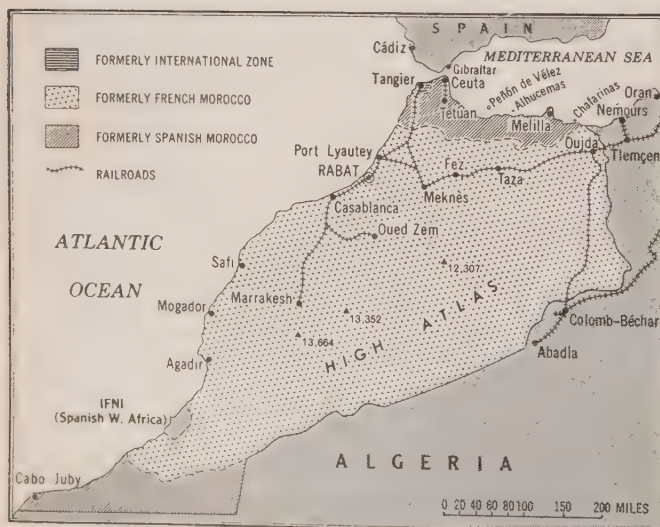
†Alhucemas, Ceuta, Chafarinas, Melilla and Peñón de Vélez (area 82 sq.mi.; pop. 141,302) remained possessions of Spain and were not included in the new state of Morocco.

Population, mostly Arabs and Berbers who are Moslem and speak Arabic (64%) or Berber (22%) or are bilingual (14%). Chief towns (pop., 1952 census): Rabat (cap.) 156,209; Casablanca 682,388; Marrakesh 215,312; Fes 179,372; Meknès 140,380. Sultan, Mohammed V ben Yusuf; prime minister in 1956, M'Barek ben Mustafa el-Bekai.

History.—With Mohammed V restored to his sultanate, Moroccan diplomacy in 1956 was mainly concerned with securing the independence and unity of the country.

A Franco-Moroccan statement of March 2 declared that the treaty of Fez (March 30, 1912) no longer reflected the needs of modern conditions and could no longer govern relations between France and Morocco. France recognized Morocco's independence, which implied the right of the state to conduct its own foreign relations and to maintain its own army. The Rabat agreement of May 28 defined the future relations between the two countries on a basis of equality and of mutual respect between independent powers; their foreign ministers were to confer periodically; neither state was to adopt any policy conflicting with the other's interests; and treaties previously made by France in the name of Morocco were to be recognized as valid. André Dubois, the last resident general (appointed on Nov. 9, 1955), was accredited as French ambassador to Morocco.

In March disturbances broke out in the Spanish zone. The sultan paid a visit to Madrid. On April 7 agreements were signed between Spain and Morocco: Spain recognized Morocco as an independent and fully sovereign state; visas were no longer required in order to pass from zone to zone; the unity of the empire was to be respected; the freedom and the rights of the Spanish inhabitants were guaranteed; the sultan's legislative sovereignty was recognized; and power was to be transferred from Spanish to Moroccan officials.



MOROCCO, showing the Spanish, French and international zones which were joined to form an independent sultanate in 1956

An outburst of enthusiasm welcomed the sultan on his return. Difficulties subsequently made themselves felt. The continued presence of French and Spanish forces gave rise to patriotic impatience. Tangier was still an international zone, but the Moroccan delegation was withdrawn from the local assembly, which suspended its sessions. The death of Thami el-Mezuari el-Glaoui in January put an end to large-scale feudalism, and his supporters in Marrakesh were assassinated. The "army of liberation," a product of the period of dispute with France, remained in control of several areas: while recognizing the sultan's leadership, it retained its freedom of action and showed a spirit of independence.

It remained uncertain what course the country would follow in politics. The sultan promised to set up a national consultative council in October, the members of it being nominated by himself. Rivalry continued between the Istiqlal and Democratic parties, both of which were represented in the Bekai government. The Istiqlal sought control of affairs; and in August its national council proposed the resignation of Istiqlal members from the government, the formation of a single-party cabinet, the abrogation of the treaty of Algeciras (April 7, 1906, consecrating the economic internationalization of Morocco), the withdrawal of foreign troops, the incorporation of Colomb-Béchar and of Mauritania into Morocco, support for the insurgents in Algeria and economic independence for the country.

The arrest by the French on Oct. 22 of the five Algerian nationalist leaders, flying from Morocco to Tunis, caused a crisis. Morocco broke off diplomatic relations with France. A new Bekai government, formed on Oct. 27, excluded the Democratic Independence party. Nevertheless, unofficial relations with France continued and many French officials remained in Morocco.

On Nov. 12 Morocco was admitted to the membership of the United Nations. (See also FRANCE; FRENCH UNION.)

(HU. DE.)

Foreign Trade.—(1955) Monetary unit: Moroccan franc=metropolitan franc; U.S. \$1=350 metropolitan francs. Imports 164,000,000,000 fr., including 79,000,000,000 fr. from France, 15,000,000,000 fr. from the U.S. Exports 109,000,000,000 fr., including 49,000,000,000 fr. to France. Principal exports: phosphates 21,000,000,000 fr., dried fish 6,000,000,000 fr., cereals 16,000,000,000 fr.

ENCYCLOPÆDIA BRITANNICA FILMS.—*Mediterranean Africa* (1952).

Morocco, Spanish: see SPANISH COLONIAL EMPIRE.

Mortgages, Farm: see FARM CREDIT SYSTEM; FARMERS HOME ADMINISTRATION.

Mortgages, Home: see BANKING; HOUSING.

Motion Pictures. A number of seeming paradoxes appeared to characterize U.S. motion-picture developments during 1956. By the end of November, it was expected that foreign grosses from the rental and sale of U.S. motion pictures would top the spectacular mark of 1955, while there was a general drop in motion-picture attendance in the U.S. and a corresponding drop in domestic theatre box-office returns. At the same time, certain pictures with impressive qualities and footage were rolling up astonishing domestic grosses. The overall drop in national attendance occurred despite an increase in pictures produced and released as compared with the previous year.

Industry Statistics.—The average weekly attendance at motion-picture theatres for 1956 was expected to be about 42,000,000 as compared with an average of about 45,000,000 for 1955. However, there were strong indications that a number of new pictures would brighten prospects considerably for the end of the year and the early part of 1957.

United States theatre grosses, excluding taxes, were estimated to be \$1,194,100,000 in 1955, as compared with \$1,150,700,000 in 1954, an increase of \$43,400,000. This reflected, to some extent, the benefits derived from the cut in the federal excise tax

an over-all 20% on admission prices to 10% on tickets over cents which went into effect on April 1, 1954. With many theatres still in financial distress, the industry pressed for further relief and succeeded with the passage of the King bill. Effective Sept. 1, 1956, the federal tax was reduced further to 10% on admissions exceeding 90 cents. It was estimated that an additional 9,000 theatres would be exempted from the federal tax on admissions as a result of the new measure, and that the box-office gross would be augmented by \$50,000,000 on an annual basis.

While it was expected that the domestic gross for 1956 would show a decrease from the prior year's figure, this would be offset to some degree by the new tax relief and by good box-office pictures in release at the close of the year.

An industry source indicated that at the beginning of 1956, there were 19,200 motion-picture theatres in operation in the U.S., composed of 14,613 indoor theatres and 4,587 drive-in theatres. This total represented a small increase from the previous year, largely in the number of drive-in theatres. A U.S. Bureau of the census report underscored the tremendous development of the drive-in theatre. In 1948 there were 811 such theatres with revenue of \$47,000,000. In 1954, 3,775 drive-ins did a total business of \$228,000,000.

On Jan. 1, 1955, an estimated 108,537 theatres were exhibiting motion pictures in approximately 120 countries and territories throughout the world. This was an increase of 9% over a 1951 estimate of 99,543 theatres.

According to the U.S. department of labour, employment in the U.S. motion-picture industry was averaging about 224,600 during the first seven months of 1956. The annual average for 1955 was 230,700.

Industry sources estimated total capital invested in the industry at \$2,738,700,000, broken down as follows: studios (production), \$142,000,000; distribution, \$25,700,000; theatres, \$50,000,000; nontheatrical, \$21,000,000. Profits for most motion-picture corporations during 1956, with a few exceptions, were below those of previous comparable periods.

Production.—By the end of Nov. 1956, the U.S. Production Code administration had approved 312 feature pictures, including 24 domestic and 48 foreign. For 1955 the entire year's total was 305, including 269 domestic and 36 foreign.

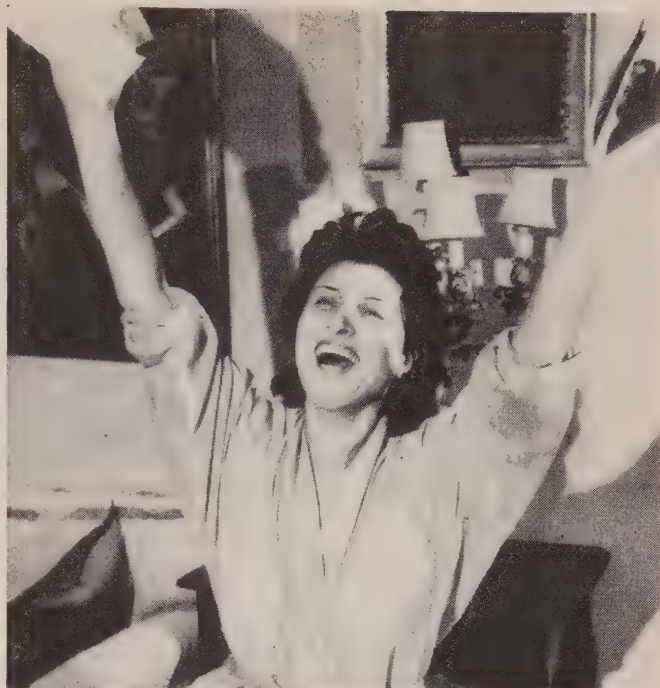
For 1956, 11 national distributors had scheduled for release 312 new feature pictures. This compared with 274 actual new releases for 1955.

Of 269 pictures analyzed in November, 116 or 43% of the total were produced in colour. This compared with 50% (154 pictures) in all of 1955.

The interim analysis showed further that of those 269 pictures, 109 or roughly one-third, were produced in one of the new wide-screen processes; i.e., CinemaScope, VistaVision, SuperScope, etc. CinemaScope led with a total of 60, followed by VistaVision with 17. A new process, sponsored by Republic Pictures, called Surama appeared with three pictures produced. In 1955 there were 115 pictures, or roughly 37% of the total approved by the Production Code administration, that had been produced in these processes.

Foreign Sales of U.S. Films.—Although domestic revenues in 1956 fell off somewhat compared with the previous year, foreign picture sales increased. It was estimated that revenue from abroad would equal or surpass the \$215,000,000 estimate of 1955, with annual dollar receipts running from \$175,000,000 to \$180,000,000. The increasing importance of the foreign market was shown by the fact that U.S. companies were receiving from 45% to 50% of their total revenue from abroad.

World film rentals for U.S. pictures continued to fluctuate around the \$650,000,000 level. Popularity of U.S. films abroad



JUBILANT ACTRESS Anna Magnani of Italy receiving the news that she had won the award of "Best Actress of the Year" by the U.S. Academy of Motion Picture Arts and Sciences on March 21, 1956

continued high, approximately 68% of the world's screen time being devoted to them. The world-wide weekly audience for U.S. films was estimated at 260,000,000.

Foreign Exports of Films to the U.S.—A film industry journal reported that a total of 138 foreign features were released in the U.S. in 1955, compared with 174 during 1954. This, however, was not a fair measure of foreign film imports, since a great many foreign language pictures, such as Mexican, Chinese and Japanese, which were brought in in large numbers, were exhibited chiefly in immigrant areas. For example, in 1955 a total of 247 positive prints of Mexican feature pictures alone were imported. (Britain sent in as many as 1,335 such positive prints.) In the first half of their fiscal year ended Sept. 30, 1956, the New York state censors reviewed 298 imported pictures against 244 in the same period in 1955 and 211 in 1954. Leading film exporters to the U.S. were Great Britain, Mexico, Italy, Japan, Hong Kong, Argentina, west Germany, the U.S.S.R. and France.

Among the outstanding foreign features released in the U.S. during late 1955 and 1956 were: *A Kid for Two Farthings* (British); *Richard III* (British); *Wee Geordie* (British); *Diabolique* (French); *Fruits of Summer* (French); *Letters From My Windmill* (French); *Proud and the Beautiful* (French); *Rififi* (French); *La Strada* (Italian); *The Magnificent Seven* (Japanese); *Marcelino* (Spanish); *The Silent World* (French); *Private's Progress* (British); *Golden Demon* (Japanese); *The Last Ten Days* (German); *The Ladykillers* (British); *Vitelloni* (Italian).

New Developments and Organizational Changes.—In May 1956 control of Warner Bros. Pictures, Inc., was purchased by a group headed by Serge Semenenko of the First National Bank of Boston and Charles Allen, Jr., investment banker. RKO Theatres Corp. acquired the assets of the Cleveland Arcade Co., including its controlling stock of Gera Corp. The merged organization's name was changed to RKO Industries Corp. American Broadcasting-Paramount Theatres, the nation's largest motion-picture theatre circuit and owner of the ABC television network, announced that it would enter the field of motion-picture production. This was later implemented by the formation of Am-Par Pictures Corp.

The Rank Organization, Great Britain's large integrated motion-picture enterprise, announced that it would form a distribution company in the United States in order to achieve wider reception of British pictures in that country.

The U.S. department of justice's antitrust suit against dis-

nated motion-picture companies, charging conspiracy to withhold 16-mm. pictures from television and other nontheatrical outlets, went to trial in California in Oct. 1955. On Dec. 6, 1955, the court found for the defendant producers and distributors. Judge Léon Yankwich, in his opinion, ruled that the testimony concerning the alleged restrictive practices warranted the conclusion that whatever similarity existed in the pattern for marketing 16-mm. films was based on the similarity of the problem with which producers were confronted. Further, he stressed that each defendant had to consider the effect of the release of 16-mm. films on the business of its primary source of income, the regular theatre.

Nevertheless, Dec. 1955 saw the beginning of the release of large blocks of major company pictures for telecasting. About five months after General Teleradio, subsidiary of General Tire & Rubber Co., purchased RKO Radio Pictures, the entire film inventory of RKO, comprising 740 features and 1,100 short subjects, was sold to C. & C. Super Corp. for \$15,200,000. It was the most significant of all television deals to that date because it broke the solid ranks of the major studios.

In March 1956 Warner Bros. followed the lead set by RKO by selling their pre-1948 film library to PRM, Inc., in a \$21,000,000 deal. Linked with PRM in the transaction was Associated Artists Production, the film distributing firm that would release the pictures to television and to theatres as reissues.

In May 20th Century-Fox announced that an arrangement had been concluded on a straight guarantee and profit percentage basis with National Telefilm Associates whereby the latter would release to television 52 20th Century-Fox pictures. Later in the year, this operation was expanded by a new agreement wherein N.T.A. acquired the television distribution rights to 156 pre-1948 features, optioned 234 more, and 20th Century-Fox acquired a 50% stock interest in N.T.A.'s subsidiary, N.T.A. Film Network.

At the same time, Loew's announced (1) that they would handle their own television distribution of pre-1949 M-G-M pictures; (2) that they would extend production to include special pictures for television; and (3) that they would acquire television station ownership. As a start, the company began to place its library of 725 features in 12 markets.

Columbia Pictures also revealed that they were turning over a large block of features to Screen Gems, their television subsidiary company.

Trend in Film Subjects.—There appeared to be no clear-cut trend which characterized the film subjects of 1956. The so-called "big" pictures leaned heavily on the presold values of well-known novels, plays, classics and historical themes, as, for example, *Around the World in 80 Days*, *Giant*, *The Ten Commandments*, *Tea and Sympathy*, *Friendly Persuasion*, *War and Peace*, *Moby Dick*, *The King and I*, *Bus Stop*, *Lust For Life*, *Alexander the Great*, *The Man in the Gray Flannel Suit*, *Carousel* and *Teahouse of the August Moon*. For the rest, there was the usual preponderance of western and adventure melodramas, dramas of the social problem, romantic and military variety, comedies, science fiction yarns, musicals, etc.

One development was the advent of several pictures exceeding or approaching three hours in length for the first time since *Gone With the Wind* (220 minutes). They were: Cecil B. De Mille's crowning epic *The Ten Commandments*, produced in VistaVision at a record cost of \$13,000,000 (219 minutes); Paramount's brilliant production of *War and Peace*, also VistaVision (208 minutes); George Stevens' fine filming of Edna Ferber's *Giant* (200 minutes); and the highly successful Todd-AO production of *Around the World in 80 Days* (170 minutes), a rib-tickling version of the Jules Verne classic, replete with 40 stars of international fame.

Two outstanding musicals appeared in 20th Century-Fox's new

CinemaScope 55 process which elicited high praise, namely *Carousel* and *The King and I*. Other musicals well received were *High Society*, *Meet Me in Las Vegas*, *The Court Jester*, *Anything Goes* and *The Opposite Sex*.

Among the outstanding comedies of the year were *Teahouse of the August Moon*, *Bus Stop*, *The Solid Gold Cadillac* and *You Can't Run Away From It*.

Documentaries and Short Subjects.—Several beautifully produced colour studies of nature and marine life received widespread acclaim. The French production *The Silent World*, Cannes festival winner, was an unusual feature dedicated to undersea life, made by Capt. Jacques Yves Cousteau and his crew of aqualung skin divers and technicians. *Secrets of the Reef* was a fascinating study of the microscopically minute details of marine life on a coral reef off Florida. Walt Disney's newest "True-Life Adventure" feature, *Secrets of Life*, recorded the hidden wonders of the plant, insect and animal kingdoms. *The Animal World* attempted to depict the development of animal life since the beginning of time.

A growing number of short subjects were enhanced by being produced in CinemaScope and VistaVision. Some of the outstanding CinemaScope shorts of 1956 were 20th Century-Fox's *The Dark Wave* (problem of epilepsy), Warner's *Journey to the Sea* (Rhine river travelogue) and Columbia's *Wonders of Manhattan*. Paramount's VistaVision process contributed beautiful scenic studies in *VistaVision Visits Gibraltar*, *VistaVision Visits Panama*, *VistaVision Visits Japan* and *VistaVision Visits Austria*. Other notable short subjects included Universal's *Everybody Dances* (national dances throughout the world), Disney's *Man in Space* (space travel to come), M-G-M's *The Wedding in Monaco*, Warner's *Green Gold* (life in Ecuador), Universal's *A Time Out of War* (unusual Civil War story), the University of Southern California's *The Face of Lincoln* and Warner's *Out of the Desert* (scenes from Egypt).

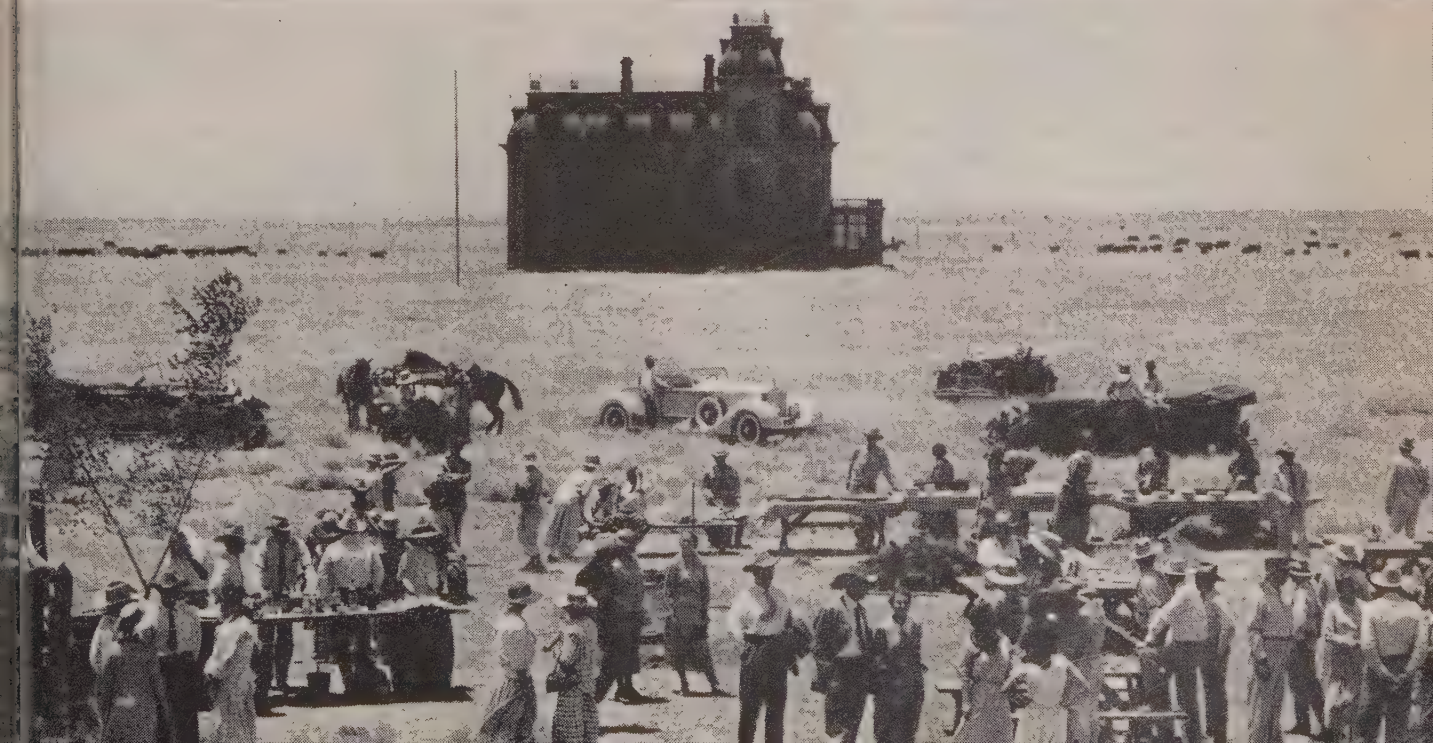
Polls and Awards.—The Academy of Motion Picture Arts and Sciences announced in 1956 the following awards for 1955:

BEST PRODUCTION.—*Marty* (Hecht & Lancaster—United Artists).
ACTOR.—Ernest Borgnine (*Marty*).
ACTRESS.—Anna Magnani (*The Rose Tattoo*).
SUPPORTING ACTOR.—Jack Lemmon (*Mister Roberts*).
SUPPORTING ACTRESS.—Jo Van Fleet (*East of Eden*).
DIRECTION.—Delbert Mann (*Marty*).
MOTION-PICTURE STORY.—Daniel Fuchs (*Love Me or Leave Me*).
SCREENPLAY.—Paddy Chayefsky (*Marty*).
STORY AND SCREENPLAY.—William Ludwig and Sonya Levien (*Interrupted Melody*).
SCORING, MUSICAL.—Robert Russell Bennett, Jay Blackton and Adolph Deutsch (*Oklahoma!*).
SCORING, COMEDY OR DRAMA.—Alfred Newman (*Love Is a Many-Splendored Thing*).
SONGS.—"Love Is a Many-Splendored Thing" (*Love Is a Many-Splendored Thing*); music, Sammy Fain; lyrics, Paul Francis Webster.
SHORT SUBJECTS.—One-reel: *Survival City* (20th Century-Fox). Two-reel: *The Face of Lincoln* (University of Southern California presentation. Cavalcade Pictures, Inc.). Cartoon: *Speedy Gonzales* (Warner Bros.).
ART DIRECTION.—Black and white: Hal Pereira and Tambi Larsen (*The Rose Tattoo*). Colour: William Flannery and Jo Mielziner (*Picnic*).
CINEMATOGGRAPHY.—Black and white: James Wong Howe (*The Rose Tattoo*). Colour: Robert Burks (*To Catch a Thief*).
COSTUME DESIGN.—Black and white: Helen Rose (*I'll Cry Tomorrow*). Colour: Charles Le Maire (*Love Is a Many-Splendored Thing*).
FILM EDITING.—Charles Nelson and William A. Lyon (*Picnic*).
DOCUMENTARY SHORT SUBJECT.—*Men Against the Arctic* (Walt Disney—Buena Vista).
DOCUMENTARY FEATURE.—*Helen Keller in Her Story* (Nancy Hamilton presentation).
SOUND RECORDING.—Fred Hynes (*Oklahoma!*).
SPECIAL EFFECTS.—*The Bridges at Toko-Ri* (Perlberg-Seaton—Paramount).
Film Daily's poll of the ten best pictures included: *Mister Roberts* (Warner Bros.); *Marty* (United Artists); *East of Eden* (Warner Bros.); *Blackboard Jungle* (M-G-M); *Bad Day at Black Rock* (M-G-M); *A Man Called Peter* (20th Century-Fox); *Trial* (M-G-M); *Love Me or Leave Me* (M-G-M); *Summertime* (United Artists); *Love Is a Many-Splendored Thing* (20th Century-Fox).
Daily Variety's poll for 1955 included: best picture, *Marty* (United Artists); best actress, Anna Magnani, *The Rose Tattoo* (Paramount); best actor, Ernest Borgnine, *Marty*; supporting actress, Jo Van Fleet, *East of Eden* (Warner Bros.); supporting actor, Jack Lemmon, *Mister Roberts* (Warner Bros.); best screenplay, *Marty* (Paddy Chayefsky); best director, Delbert Mann (*Marty*); best original, *Love Me or Leave Me* (Daniel



U.S. AND FOREIGN MOTION-PICTURE PRODUCTIONS OF 1956

Top, left: Sir Laurence Olivier and Claire Bloom in the film version of Shakespeare's *King Richard III*. The Olivier production was the first important motion picture to have its *première* on television before release to theatres. Top, right: Scene from *Picnic*, an adaptation of the play by William Inge, starring Kim Novak, William Holden, Rosalind Russell and Betty Field. Left: Giulietta Masina, Italian actress in her first major role as a circus performer's assistant in *La Strada* ("The Road"), with Anthony Quinn. Right: Gregory Peck as Captain Ahab in the John Huston production of Herman Melville's novel, *Moby Dick*. Bottom: Scene from *Giant*, with Elizabeth Taylor, James Dean and Rock Hudson. Based on a novel by Edna Ferber, the film was directed by George Stevens



Fuchs, M.-G.-M.).

New York Film Critics' awards for 1955 were: best picture, *Marty* (United Artists); best actor, Ernest Borgnine, *Marty*; best actress, Anna Magnani, *The Rose Tattoo* (Paramount); best director, David Lean, *Summertime* (United Artists); best foreign-language pictures, *Diabolique* and *Umberto D.*

Motion Picture Daily box-office hits of 1955 included: *Battle Cry* (Warner Bros.); *Blackboard Jungle* (M.-G.-M.); *The Bridges at Toko-Ri* (Paramount); *The Country Girl* (Paramount); *Lady and the Tramp* (Disney); *The Left Hand of God* (20th Century-Fox); *The Long Gray Line* (Columbia); *Love Is a Many-Splendored Thing* (20th Century-Fox); *Love Me or Leave Me* (M.-G.-M.); *A Man Called Peter* (20th Century-Fox); *Mister Roberts* (Warner Bros.); *Not as a Stranger* (United Artists); *The Seven Little Foys* (Paramount); *The Seven Year Itch* (20th Century-Fox); *A Star Is Born* (Warner Bros.); *Strategic Air Command* (Paramount); *To Hell and Back* (Universal); *There's No Business Like Show Business* (20th Century-Fox); *20,000 Leagues Under the Sea* (Disney); *Vera Cruz* (United Artists).

Box-office All-American favourites of 1955 were: June Allyson, Grace Kelly, Humphrey Bogart, Marlon Brando, Jane Wyman, William Holden, Doris Day, James Stewart, Gary Cooper, Bing Crosby, John Wayne, Elizabeth Taylor. (M. L.N.)

Educational Motion Pictures.—In 1956 the cost of producing instructional, training, institutional and public relations motion pictures in the U.S. was estimated at \$90,000,000. This gross output included the sales of 156 commercial studios and 19 specializing organizations in the school and religious film fields. The Audio-Visual Commission on Public Information, formed during the year, was striving to put educational film expenditures in schools on an equitable basis with expenditures for textbooks. "Gateway to Learning," the commission's first publication, explained to school officials and the general public the advantages of audio-visual materials.

The television industry made several notable contributions. Its documentary programs were utilized as regular 16-mm. classroom films, and it was experimenting with closed-circuit techniques, not only at the college level but also in the Hagerstown, Md., public schools, which were supplied with closed-circuit equipment by radio and television equipment manufacturers. Accredited courses for home study were launched by educational television station WTTW in Chicago, Ill., and a grant from the Ford foundation enabled Encyclopædia Britannica Films, largest and oldest of the classroom film producers, to begin filming physics experiments from the programs of the Pittsburgh, Pa., educational television station.

The total of classroom films available to the schools on a worldwide basis (through translated versions) exceeded 2,000 titles by the end of 1956. Contributing to this greatly expanded teaching resource were the 56 new films added to the Encyclopædia Britannica Films library of 800 titles. Coronet Films' total of 664 catalogued titles included 67 new releases during 1956. Sixty new titles by Young America Films and the Text-Film division of McGraw Hill included the adaptation of television programs such as "You Are There" and "See It Now." Social studies were predominant among the classroom films produced in 1956, and American history and world history were the favoured themes.

Encyclopædia Britannica Films noted a sharp increase in the use of audio-visual educational materials, and reported its biggest fiscal year. Pursuing its goal of "bringing the world to the classroom," it produced such films as *The Oregon Trail* and *Roger Williams*. The release of nearly all of Metro-Goldwyn-Mayer's feature films for 16-mm. school use made hundreds of additional titles available.

The Academy of Motion Picture Arts and Sciences honoured as the best two-reel documentary film of the year *The Face of Lincoln*, produced by the department of cinema, University of Southern California.

Industry's concern with improving human relations and with new industrial processes accounted for several widely used films. *This Is Automation*, sponsored by General Electric, gave a useful exposition of these techniques; *The Ford People* (Ford Motor Co.), *The Living Circle* (United Fruit Co.), *Teamwork* (Bethlehem Steel Co.) and *The Dragon Slayer* (du Pont) were

widely shown examples of industrial relations themes on film.

At midyear the Films committee of the Association of National Advertisers and the National Education association co-operated in improving film standards through the publication of a "Criteria for Business-Sponsored Educational Films."

The plight of the aged was dealt with by the National Social Welfare assembly in *A Place to Live*. Ten thousand physicians attending the annual proceedings of the American Medical association in Chicago viewed 75 medical films; delegates to the San Francisco congress of the American College of Surgeons in October saw 85 films on latest surgical and medical technique. A high light of the American Medical association meeting was the showing of a group of Russian medical films, the first brought to the U.S. in many years and the result of a diplomatic exchange.

A first international medical film exhibition was scheduled for June 1957 under the auspices of the American Medical association committee on Medical Motion Pictures. Late in 1956 a new film series on "Medicine and the Law" was announced, and the first title, *The Medical Witness*, was shown at Seattle, Wash., in November.

The American Bar association was producing a training film series on jurisprudence, seeking to improve courtroom procedures and to lower the number of untried cases on dockets throughout the land.

United States government agencies, led by the department of defense, the military services and the U.S. Information agency, were active in producing and distributing training and informational films. The bureau of mines sponsored as its latest addition to a "state" film series *Idaho and Its Natural Resources*, which was released in the fall.

At the annual National Audio-Visual convention in Chicago in July, more than 2,000 professional workers in trade, industrial and educational film operations saw the latest equipment and discussed the problems of their respective fields. (O. H. C.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Bring the World to the Classroom* (1938); *Making Films That Teach* (1954); *New Tools for Learning* (1952); *Using the Classroom Film* (1945).

Technical Developments.—Although 1956 was mainly a period of evaluation of wide screens previously adopted by the industry, two new systems made their appearance.

Thrillerama.—Thrillerama employs two motion-picture cameras mounted on a common base and two conventional projectors locked together in the theatre booth. This system is similar to Cinerama, which uses three cameras and three projectors operating in synchronism for photography and projection. Thrillerama results in a screen aspect ratio (width to height) of 3½ to 1. "Thrillerama Adventure" was first shown in Texas in August.

Technirama.—Technirama is a new large-screen system developed by Technicolor, which employs a standard 35-mm. negative moving horizontally through the camera and exposing an eight-perforation frame (two normal 35-mm. frames). The camera lens has an anamorphic ratio of 1.5 to 1. When the Technicolor prints are made by the imbibition process, the negative image size is reduced and a 1.3 anamorphosis added in the printer, resulting in a 2 to 1 anamorphic print similar to a CinemaScope print with a screen aspect ratio of 2.35 to 1. This horizontal negative film movement with an eight-perforation frame is similar to VistaVision, except that VistaVision has not made anamorphic prints.

Film Splicer.—An electronic method of film splicing, utilizing radio frequency power to weld film, was developed by E. I. du Pont de Nemours & Co. Du Pont's new polyester film base Cronar does not fuse properly with application of regular film splicing. This method was, therefore, developed to splice Cronar base. However, it was found that the present triacetate safety base film also responds favourably to the electronic splicer. Such splicers were being manufactured and were to be tried out in

Summary Statistics of Canadian Motion-Picture Production
(Private industry)

Year	Salaries and wages	Gross revenue Production	Printing and laboratory
1952	\$1,006,918	\$1,331,393	\$1,274,137
1953	1,150,890	1,592,779	1,230,493
1954	1,549,233	2,106,131	1,456,405
1955	1,460,421	2,456,038	1,817,784

the increase in the amount of film production for television.

(F. R. Cy.)

Great Britain.—In 1955 the latest attendance figures in the United Kingdom had indicated that the motion-picture industry had not suffered unduly by the opening of the Independent Television authority's programs on Sept. 22, 1955. But some figures published in 1956 showed a rather more serious situation. In his statement to the annual general meeting of the Rank Organisation Ltd. on Oct. 5, 1956, the chairman, J. Arthur Rank, said that as the I.T.A. stations had opened independently of each other it had been possible to measure their effect over the first six or seven months of their operation. This had shown a 10% fall in motion-picture attendances in the regions covered by the new stations compared with the rest of the country.

The fall in attendances was not confined to those areas served by the new television stations. Official statistics published by the board of trade on Oct. 17, 1956, showed that the average weekly attendance rate for the second quarter of the year was 21,500,000, 9% less than for the same quarter of 1955. In 1950 (the first year for which official statistics were collected) the equivalent figure was 26,300,000, about 10% above the 1955 rate. Because of seasonal fluctuations, these figures did not give a completely accurate picture of the annual decline; nevertheless it was true to say that in the seven years from 1950 to 1956 British motion pictures had lost about one-fifth of their domestic audience.

In Great Britain nearly one-third of the gross box-office receipts in 1956 were removed from the industry by the entertainments tax, a percentage which, with only slight reductions, had existed for a decade. Faced with a declining attendance rate and increasing operating costs, the British film industry set up a committee, known as the All-Industry Tax committee, to present its case for entertainments tax reduction to the chancellor of the exchequer. This case was presented early in 1956 but, presumably because of prevailing national economic difficulties, the case failed. The industry's contention was that unless there was a very substantial reduction in the rate of tax many theatres would have to close their doors, thus reducing even further the potential earnings of film makers and of the exchequer itself.

This contention was turned into fact when the Rank organization announced in October that during the next few months it proposed to close 79 theatres which in the previous year had paid £455,453 in entertainments tax and £316,870 in film rental. Nor were these the only closings announced during the year.

(D. Cw.)

Other Countries.—Various influences, commercial, technical, artistic and personal, loosened the rigid patterns of the film industry and made 1956 a year of variety and originality, rather than one of much conventional accomplishment.

Epic in size and subject, *War and Peace*, an adaptation of Tolstoy's novel, was filmed in Italy, directed by Hollywood's King Vidor and played by a mainly Anglo-American cast. Performances of real distinction came from Henry Fonda as Pierre, Mel Ferrer as Prince Andrey, Audrey Hepburn as Natasha and Herbert Lom as Napoleon, although the film, which ran for three-and-a-half hours and reputedly cost more than £1,000,000 to make, was not altogether free of stiffness.

Of British films, *A Town Like Alice*, honourably documentary in manner, dealt with British women prisoners of war

studios and exchanges in 1956. This dielectric splice is stronger, can be made more rapidly and is entirely automatic.

Improved Black and White Negative.—Eastman Kodak Co. early in 1956 made available to the motion-picture industry a new plus X panchromatic negative film (type B). This film is a high-speed, fine-grain negative material suited for both interior and exterior lighting conditions. It has approximately the same speed as the previous plus X film but a much lower granularity so that the graininess observed in a print made from this negative is greatly reduced. In addition, the acuteness, the factor which expresses the ability of a film to reduce sharp images, is much higher than that of the older film. These properties, graininess and acuteness, assumed greater importance since the adoption of wide-screen processes by the industry.

Drive-In Theatres.—The construction of new drive-in theatres continued, with a trend toward theatres of larger capacity and with screens of extremely large size. A drive-in located on Long Island, N.Y., for example, had a capacity of 2,509 cars and occupied more than 30 ac., with the back ramp about 1,200 ft. from the screen. The screen itself was 60 ft. x 142 ft.

RF Lamp.—Sylvania Electric Products, Inc., developed, with the co-operation of the Motion Picture Research council, a new uniform light source known as the RF (radio frequency) lamp. In some types of motion-picture film printing it is extremely desirable to have a light source of uniform brightness. This lamp, the first such developed, consists of a disk which is heated to incandescence by radio frequency energy so that there are no actual electrical contacts with the source of illumination. The disk itself provides a very uniform light source which is necessary in properly exposing motion-picture film in printing processes. It was placed in use in several laboratories in Hollywood, Calif.

Curved Film Gate.—The use of larger screens in theatres and drive-ins necessitated more light and consequently more heat on the film during projection. This tended to make the film buckle and breathe, that is, actually move in the projector aperture while it was being exposed on the screen, with a resulting lack of sharpness on the screen. A new type curved film gate was developed which, while not a new invention, had been perfected so that it held the film in a curved position in the aperture, giving the film added stiffness to withstand this intense light and heat. This added stiffness minimizes film movement in the aperture, resulting in a picture of improved quality on the screen.

(W. F. Ky.)

Canada.—The signs apparent in 1955 that the spread of television in Canada might result in the establishment of a Canadian entertainment film industry turned out in 1956 to be soundly based.

In 1956 a Canadian corporation was formed to produce in Canada a series of 26-min. dramatic entertainment film programs for world television release. In Dec. 1956 this program went on the air in the United States, and was scheduled for an early 1956 release over the Canadian Broadcasting system network. Other Canadian film production for television in 1956 consisted entirely of documentary shorts and commercial spot films. At the end of 1956 several other entertainment series were reported either in production or planning stages by other Canadian producers.

The Canadian government film production agency (the National Film Board of Canada) moved from Ottawa, Ont., to Montreal, Que., during 1956, into newly constructed studios and offices which cost \$8,500,000.

A tabulation from the report of the Canadian government bureau of statistics, covering Canadian motion-picture production in the private industry for all purposes, is shown in the table.

Industry leaders estimated that the 1956 figures would show an increase of about 50% over 1955, resulting altogether from

marched back and forth across Malaya by their Japanese captors. A striking performance by Virginia McKenna and honest direction by Jack Lee could not quite conceal the film's origins in a best-selling novel by Nevil Shute. It was unlucky enough to be disqualified from the Cannes festival on the grounds that it might offend the Japanese.

Yield to the Night, released shortly after the agitation for the abolition of capital punishment, was a study of a woman condemned to hang. The crime was told in a sometimes overelaborate flashback, but the scenes in the condemned cell were bleakly harrowing. The film was notable for the sullen, straightforward playing of the murderess by Diana Dors, with the wardress of Yvonne Mitchell outstanding in a fine supporting cast.

The Ladykillers starred the septuagenarian Katie Johnson as the landlady who unwittingly takes in gangsters. Of these, Alec Guinness and Peter Sellers made this a suitably ghoulish comedy with which to take leave of Ealing Studios. *Pacific Destiny*, an inadequate version of Sir Arthur Grimble's delightful *Pattern of Islands*, was charmingly true in feeling and quality for the South Sea islands, and their inhabitants.

Gene Kelly's experimental ballet film *Invitation to the Dance*, of which he was star, director and choreographer, was chosen to open the Edinburgh film festival with a performance before the queen. In three parts—mime, modern ballet and combined human and cartoon dance-fantasy—it could not be called a satisfactory whole, but was a decidedly appealing experiment.

Festival results reflected a new informality, replacing old hard and fast categories. At the Venice festival a new policy designed to raise the standard found no film fit to be awarded the Golden Lion of St. Mark. At Cannes the Grand Prix went to a French documentary, *The World of Silence*, the first choice, *The Red Balloon*, being a short and therefore ineligible.

A fascinating novelty from Australia was *Jedda*, a primitive but moving story of an aboriginal girl adopted by a white woman and faced with a choice between worlds. Another simple story of the Australian bush with considerable charm was *Smiley*, with Colin Petersen as a child hero of more than average appeal, Chips Rafferty as the local sergeant and Ralph Richardson as the parson.

The outstanding continental film was René Clair's *Les Grandes Manoeuvres* (*Summer Manoeuvres*; U.S. title *The Grand Maneuver*). This bitter romance of a Don Juan who falls in love too late was played with immense style and elegance by Michele Morgan and Gérard Philipe. Also from France came *Le Défroqué*, a powerful religious drama with Pierre Fresnay as the unfrocked priest, and *Les Diaboliques*, a macabre murder mystery. French entries well received at the Venice festival were René Clement's *Gervaise*, whose star, Maria Schell, won one of the Volpi cups for acting, and Claude Autant-Lara's comedy *La Traversée de Paris*, for which the comedian Bourvil won the other cup.

Two Spanish films were among the leading entries at Venice: *Calle Mayor* (*Main Street*) by J. A. Bardem, whose harsh and brilliant *Death of a Cyclist* had been shown earlier in the year, and L. G. Berlanga's gentler comedy *Calabuig*.

Although Italy sent no great film, L. Emmer's *The Bigamist* was an amusing and lighthearted village satire, with Vittorio De Sica as a wonderful burlesque counsel for the defense.

From Sweden came *Smiles of a Summer Night*, a supremely well acted, exceedingly stylish piece, of an amorality widely compared with Restoration comedy. Two Austrian films of great interest were *Der Letzte Akt* and *Es geschah am 21 Juli*, G. W. Pabst's contributions to the history of Hitler's Germany.

India sent *Two Acres of Land*, a touching story of an evicted Bengal farmer. Japan's *Harp of Burma* was highly regarded at Venice.

The U.S.S.R. continued to send pictures aimed more at art (opera or ballet) than propaganda. Most memorable were the superbly mounted *Boris Godunov* and a series of Shakespearean performances, including *Twelfth Night* and *Othello*.

(See also PHOTOGRAPHY.)

(F. B. Lt.)

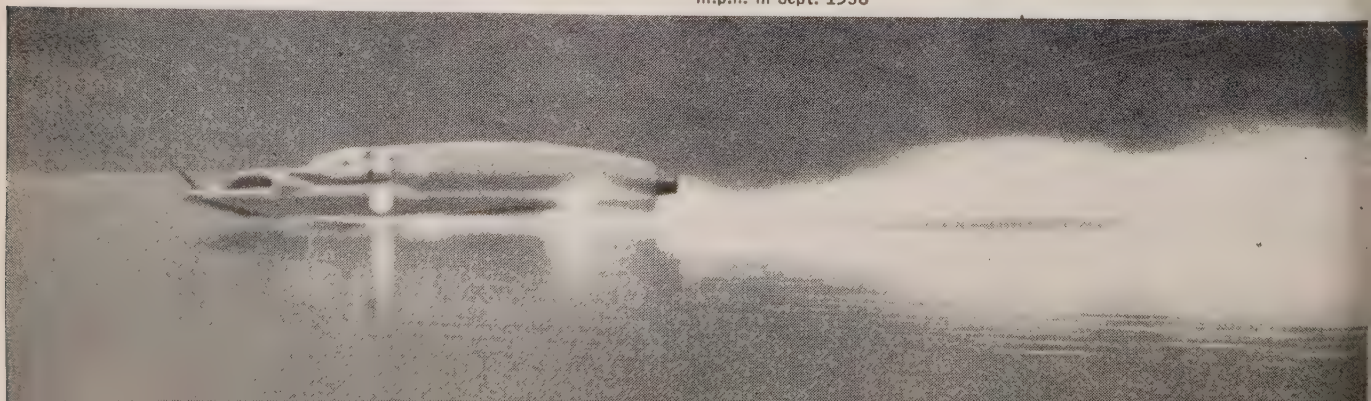
Motor-Boat Racing. During 1956, motor-boat racing records were established in almost every class of inboard and outboard racing boats, with special emphasis on the stock outboard category. There was tremendous interest in the big unlimited inboard hydroplanes, whose activities in the United States reached from coast to coast, although two west coast craft dominated the scene. Bill Wagonner's "Shanty I" won the national championship for the class Aug. 5, at the Seafair regatta at Lake Washington, Seattle, Wash., and also the Seafair trophy, which carried the richest prize ever known in power-boat racing circles, \$11,000. At Detroit, Mich., "Shanty I," again piloted by Lieut. Col. Russ Schleeh of the air force, successfully defended the Harmsworth trophy, symbol of international supremacy on the water, against the challenge of J. G. Thompson's "Miss Supertest II," representing Canada. The other west coast boat, "Miss Thriftway," owned by Willard Rhodes of Seattle, Wash., and driven by Bill Muncey, after being disqualified by the judges, was finally declared winner of the Gold cup event. Second place was awarded to "Miss Pepsi," owned by Roy Dossin of Detroit, Mich., and driven by Chuck Thompson. "Miss Thriftway" later went on to win in the President's cup races at Washington, D.C.

Donald Campbell again drove his jet-powered "Bluebird" to a new world's record for other than propeller-driven boats with an average of 225.36 m.p.h. on Sept. 19, at Lake Coniston, Eng. Norman Buckley, also of Great Britain, established a new one-hour mark for unlimited inboard boats in his "Miss Windermere III," covering 79 mi. in the one-hour run. The world's championship for the 800-kg. class was won by E. Selva of Italy.

The complete destruction of S. Sayres's "Slo-Mo-Shun IV" during qualifying trials on Aug. 30 at the Gold cup race eliminated any further attempts by this craft to raise the propeller-driven record of 178.497 m.p.h. which it held.

Winners in the stock outboard national championships were: class JU runabout, Billy Schumacher, Seattle, Wash.; AU run-

JET SPEEDBOAT, Donald Campbell's "Bluebird," streaking through the waters of Lake Coniston, Lancashire, Eng., to set a new world's speed record of 225.36 m.p.h. in Sept. 1956



out, Dean Chenoweth, Xenia, O.; BU runabout, Dave Kough, Hawthorne, N.J.; CU runabout, John Culver, Dayton, O.; DU runabout, John Jackson, Cincinnati, O.; "36," Ed Branding, Lake Villa, Ill.; A stock hydro, Dean Chenoweth; B stock hydro, Dave Kough; C stock hydro, Bill McClung, Portsmouth, Va.; and stock hydro, Bill Holloway, Monroe, Mich.

The racing outboard champions were: class M, Eric Molinar, Hollywood, Calif.; A, Orlando Torigiani, Bakersfield, Calif.; Kieth Sorenson, Laresta, Calif.; C, Doug Creech, Charlotte, N.C.; F, Ralph Homes, Phoenix, Ariz.; CSR, M. Tarnakis, Bakersfield, Calif.; CSer.H, Henry Wagoner, Fresno, Calif.; RR, Lon Stevens, Lodi, Calif.; and FRR, Chuck Parsons, Oakland, Calif.

National inboard champions crowned in 1956 were: hydros, Jack Colcock, Seattle, Wash.; 136, Sid Johnson, Cambridge, Md.; 135, Frank Neely, El Monte, Calif.; 225, Mac Wiefering, Dayton, Ky.; 266, Bill Ritner, Sr., Camden, N.J.; seven-litre, B. Bartley, Pittsburgh, Pa. (L. EL.)

Motor Transportation. The year 1956 was a period of growth for motor transportation and the automotive industry in the United States. Although motor vehicle factory sales fell considerably short of the high 1955 mark, 1956 was expected to be rated among the top three or four years in terms of vehicle output. Preliminary estimates indicated 1956's production of approximately 6,000,000 passenger cars and 1,150,000 trucks for a total of 7,150,000 vehicles, making 1956 the fourth best automotive sales year on record. It would be the fourth time that U.S. motor vehicle production topped 7,000,000 in a single year, the other years being 1950, 1953 and 1955.

During the ten years since the close of World War II, the U.S. automotive industry had produced a grand total of 67,000,000 motor vehicles, more than were built in the first four decades of the century. The number of cars, trucks and buses in use throughout the nation exceeded 65,000,000 in 1956—a 90% increase in a decade.

One of the most important milestones of the year was the adoption by congress of a new and greatly expanded federal highway program. This legislation, designed to remedy the major inadequacies of the interstate highway system, would greatly improve the efficiency of highway transportation. Another development was the heavy investment of the automotive industry in plant expansion, modernization and new equipment during 1956. Capital outlays by the industry in 1956 totalled approximately 1,000,000,000, topping all previous records.

A third high light of the year was the re-establishment of the National Automobile show in New York city, after a 16-year interval. The revival of this event, which had been a major tradition of the industry for more than 40 years prior to World War II, was as a fitting climax to this great automotive decade.

The show, sponsored by the Automobile Manufacturers association, was the largest and most spectacularly staged in automobile show history. Held in the huge new Coliseum Dec. 8 through 1956, the show included two complete floors of passenger exhibits and one floor of new truck models. The 1957 models of all U.S. passenger car makes and the products of 11 truck manufacturers were on display.

The wholesale value of the new motor vehicles sold in the year was approximately \$11,900,000,000, bringing the total for the decade to \$95,800,000,000. The wholesale value of motor vehicle replacement parts and accessories sold in the domestic market during the year reached \$1,750,000,000, only slightly above the previous year. For the entire postwar decade, replacement parts totalling \$20,000,000,000 in wholesale value had been



CONVERTIBLE FREIGHT CAR, the "Railvan," operating on the Chesapeake and Ohio railway in 1956. Rubber tires under the car could be lowered to convert the car into a motor truck van for highway travel

The mileage travelled by motor vehicles in the United States in 1956 reached a new all-time high of 605,000,000,000, bringing the cumulative ten-year total to 3,950,000,000,000 mi. During the same period 386,000,000,000 gal. of gasoline were consumed, including 49,500,000,000 gal. in 1956 alone.

Total expenditures on highways by federal, state and local agencies for the year were \$8,220,000,000, of which \$5,513,000,000 went into capital outlays and \$2,707,000,000 was spent on maintenance, administration and interest costs.

The percentage of families owning cars in the United States reached an all-time high in 1956. More than 74% of the nation's families owned cars, as compared with 68% in 1947; 10% owned more than one car. The number of licensed drivers in the nation reached a high of 77,000,000, compared with 54,500,000 a decade earlier.

(See also ROADS AND HIGHWAYS.)

(H. A. Ws.)

Motor Vehicles: see ACCIDENTS; AUTOMOBILE INDUSTRY; FEDERAL BUREAU OF INVESTIGATION; MOTOR TRANSPORTATION; URBAN TRANSPORTATION, U.S.

Mountain Climbing: see EXPLORATION AND DISCOVERY.

Mozambique: see PORTUGUESE OVERSEAS TERRITORIES.

Mules: see LIVESTOCK.

Municipal Government. Taxation and traffic were rated by a number of the largest cities in the United States as their biggest problems early in 1956, according to a report by the Citizens Budget commission of New York city. Problems related to city growth and change, such as housing and slums, population changes and suburban growth, were generally rated second; while such matters as air pollution, street cleaning and water supply were in the lowest categories, except in Los Angeles, Calif., which rated air pollution as its topmost problem. These findings were probably characteristic of the great majority of U.S. cities, regardless of their size.

Traffic and Transportation.—Traffic congestion continued to challenge the best efforts of city officials and experts alike. Long-range relief was anticipated under certain of the provisions of the comprehensive \$33,000,000,000, 13-year federal aid highway program enacted by congress in June 1956, which provided for the establishment of a 41,000 mi. network of superhighways linking 42 state capital cities and 90% of all cities of more than 50,000 population. Of the \$27,500,000,000 to be expended for modernization of the interstate system—to be defrayed 90%

by the federal government and 10% by the states—an estimated \$15,000,000,000 was to be spent on improving highways in and around cities, which would include new expressways through more than 50 congested metropolitan areas. Another estimated \$5,000,000,000 was to be spent within urban areas for urban extensions of the federal aid primary and secondary systems, these costs to be divided evenly between the federal government and the states. While the program was generally hailed as an impressive new aid in solving the problems imposed by traffic strangulation, not many cities were prepared for the effect it would have on such immediate and future problems as the physical layout of the city; relocation of houses, businesses, industries and public utilities; urban renewal programs; increased city costs; effects on land values and the city tax base.

The acute financial crisis afflicting rapid transit systems was summarized in a study by David S. Arnold of the International City Managers' association published in the Sept. 1956 issue of *Public Management*. Most were either losing money or just breaking even; some had been abandoned or passed by default into municipal ownership. In New Jersey and Pennsylvania, the Delaware River Port authority endorsed and recommended to state authorities a plan for construction of a \$242,000,000 rapid transit system linking southern New Jersey with central Philadelphia. The San Francisco (Calif.) Bay Area Rapid Transit commission had under consideration a \$1,890,000,000 plan for a rapid transit system to operate through many cities in nine counties, going underground in San Francisco and Oakland and underwater between these two cities. Chicago, Ill., became the first city in the country to build a rapid transit system into a new expressway—the Congress Street expressway; several other cities had considered similar proposals.

Approximately 115 cities were reported as having made transportation studies in recent years. Important new studies undertaken in 1956 included the Chicago Area Transportation study, a three-year \$1,850,000 co-operative project sponsored by the U.S. bureau of public roads and state, county and city agencies, covering an area of 1,400 sq. mi. within a radius of 30 mi. of the central business district; studies for the city of St. Louis, Mo., and St. Louis county arranged through the Citizens' Metropolitan Transit committee, including land use and population development, mass transit facilities, and highway patterns in the area; and an intensive origin and destination survey in the New York city region, sponsored jointly by the U.S. bureau of public roads and seven state, city and special agencies in both New York and New Jersey to determine the traffic needs of the region within a 100-mi. radius of the city. A similar transportation analysis was being made in the Washington, D.C., metropolitan area under a special congressional appropriation to the National Capital Planning commission. These studies, while independently launched, were all part of a series of highway needs surveys generated by enactment of the nation-wide federal highway program.

Metropolitan Areas.—Under a \$250,000 grant from the Stern Family fund to the Governmental Affairs institute and the Institute of Public administration, a series of studies of the governmental and political science aspects of metropolitan problems was going forward. In June 1956 the Metropolitan St. Louis survey, financed by a \$250,000 grant by the Ford foundation to St. Louis university and Washington university (St. Louis) jointly, and a supplementary \$50,000 from the McDonnell Aircraft Corporation trust, commenced a series of governmental, social and economic studies of the city of St. Louis and St. Louis county. The Haynes foundation announced a grant to the University of California at Los Angeles for a three-year study of certain aspects of the problems of government in metropolitan areas, the field work to be done in the Los Angeles area. In New

York city, grants totalling \$480,000 were made by the Rockefeller Brothers fund and the Ford foundation jointly to the Regional Plan association, a private agency, for a three-year study of the economy and population growth of the area over the next 25 years.

Two significant new permanent conferences were created in 1956. The first National Conference on Metropolitan Problems was held on April 29 to May 2 at Michigan State university, under the leadership of Frank C. Moore, former lieutenant governor of New York and president of the Government Affairs foundation, which sponsored the meeting jointly with 19 other professional groups. It was voted to form a "Continuing Conference on Metropolitan Problems" to serve as a co-operating agency, encourage research, prepare publications and sponsor meetings. A major step was taken in the tri-state New York-New Jersey-Connecticut area when Mayor Robert F. Wagner of New York city met in June with 53 representatives from suburban communities to consider their common problems; a steering committee was designated to provide for a permanent organization. The emergence of this continuing New York Metropolitan Regional Conference of Mayors and County Officials was considered to be the forerunner of some type of "local federalism" for the 550 governmental units in the region for the joint handling of problems of a regional scope, such as traffic, transportation and water supply.

Various other local groups were also studying the metropolitan aspects of their governmental problems in 1956.

Municipal Finance.—The U.S. census bureau's latest available annual report on the finances of the 481 cities with populations exceeding 25,000 (as of 1950), covering their 1955 fiscal years, continued to show substantial rises to record high levels in revenue, expenditure and debt. Total revenue reached \$8,019,000,000, an increase of 6.5% over 1954, and general revenue (which excludes income from utilities and employment retirement systems) amounted to \$6,374,000,000, an increase of nearly 7%. Total expenditure was \$8,363,000,000, an increase of 6.5% over 1954; general expenditure totalled \$6,524,000,000, an increase of almost 7%. Outstanding gross debt rose 8% to a total of \$13,175,000,000. For the third consecutive year, the increase in the cities' long-term nonguaranteed indebtedness exceeded that of their full faith and credit debt.

The growth in the use of municipal nonproperty taxes was indicated in the 1956 supplement to *Where Cities Get Their Money*, published by the Municipal Finance Officers association. Only 417, or about one-third, of the 1,347 municipalities with populations of more than 10,000 did not use any of the 14 nonproperty taxes and two service charges (garbage and sewer) included in the study. A comparison of nine of the nonproperty taxes with 1951 data showed that whereas 564 municipalities imposed 939 such taxes in 1951, 664 municipalities were utilizing 1,241 such taxes in 1956. Public utility gross receipts taxes were the most commonly used. Income and sales taxes gave the highest per capita yield and the number of municipalities with more than 10,000 population adopting the former increased from 24 in 1951 to 48 in 1956, while the number adopting the sales tax increased from 92 to at least 171 as of Feb. 1, 1956. Altogether, at least 441 municipalities of all population sizes were estimated to be using an income tax in 1955, and 900 municipalities in 10 states used a sales tax.

Surveys in 1956 by the Citizens Budget commission, New York city, substantiated the development of a definite trend toward performance budgeting and an accompanying development of standards for measuring municipal costs in the effort for greater economy and efficiency.

Home Rule; Charter Revision; Personnel.—The Kentucky legislature in 1956 authorized its legislative research commission

to make a comprehensive study of home rule for Kentucky cities and counties, to be completed by June 15, 1957, and the findings to be reported to the 1958 legislative session. New York's governor appointed a special commission to investigate the status of home rule in that state.

St. Louis, Mo., elected a charter Board of Freeholders to revise its 1914 charter. Duluth, Minn., abandoned its commission form of government and adopted the mayor-council plan; the new charter provided for an administrative assistant to the mayor, appointed by him for an indefinite term and vested with broad powers, of which however he might be deprived by the mayor at any time. Chicago revised its planning organization, effective Jan. 1, 1957, by making its planning staff into a full-edged department, directly responsible to the mayor, and converting the 15-man Chicago Plan commission into an advisory board to the new department, to which also the functions of the Housing and Redevelopment Co-ordinator were transferred.

U.S. census bureau data on city government employment released in March 1956 showed that as of Oct. 1955 there were 1,436,000 paid employees, an increase of 1% over Oct. 1954; and the payrolls approximated \$414,000,000, or 4% more than in 1954. The report pointed out that 218,000 of these employees, or 15%, were engaged on a part-time basis and received only minimal compensation. Considered in relation to rates of pay for full-time work, they were equivalent to only 44,000 full-time employees. The "full-time equivalent" total of city employees, therefore, amounted to 1,262,000 in Oct. 1955. The average monthly earnings of full-time employees amounted to \$331 on that date, compared with \$321 in 1954 and \$294 in 1952.

Federal Legislation.—Federal legislation in 1956 was exceptionally beneficial to municipalities. Outstanding was the Federal Aid Highway act. The Water Pollution Control act authorized, among other things, \$500,000,000 for grants to municipalities at the rate of \$50,000,000 a year for the next 10 years, to be expended for construction of municipal sewage treatment plants. The federal government would defray up to 30% of the costs, or \$250,000, whichever was smaller, and the municipalities the remainder; 50% of the funds had to go to cities of 125,000 population or less. Other measures authorized: participation of municipalities in a \$5,000,000,000 new flood insurance program; sponsorship by smaller municipalities of water supply projects in connection with federal flood control projects, under amendments to the Watershed Protection and Flood Prevention act; eligibility by local civil defense agencies to receive federal surplus property; liberalized social security coverage, including extension to firemen and policemen on a voluntary basis in five states; provision of 35,000 new public housing units for each of the next two years, subject to an approved "workable program," and various liberalizations of the urban renewal program, including increase of planning assistance grants from \$5,000,000 to \$10,000,000, and extension of such assistance to communities in disaster areas. Congress also appropriated \$1,750,000 for a 1957 census of governments to provide data on the number of local government units, municipal finance and employment, and for the first time on the relationship of assessed value of property to market value. As a follow-up of the report of the Kestnbaum Commission on Intergovernmental Relations submitted in 1955, Pres. Dwight D. Eisenhower appointed a special assistant to advise him on the co-ordination of federal programs as they affect state and local government, particularly in the metropolitan areas.

Urban Redevelopment and Renewal.—As of July 31, 1956, Federal Urban Renewal administration was providing federal assistance for 386 approved urban renewal projects located in 233 communities in 28 states, Washington, D.C., Alaska, Hawaii and Puerto Rico, which represented an increase of 84

over the year before. Capital grant reservations amounted to more than \$670,000,000, or \$225,000,000 more than at the same period in 1955. While almost all the major cities participated in the program, a good percentage of smaller places was included.

Redevelopment for residential use predominated, but cities were increasingly undertaking redevelopment projects for industrial and commercial purposes. Moreover, the newer approach of renewal through rehabilitation of old neighbourhoods, with spot clearance where needed, initiated under the 1954 housing act, was well under way in 1956.

Considerable interest was expressed in the Milwaukee (Wis.) procedure of ordering demolition at the owners' expense, without compensation, of buildings that failed to meet the housing standards, under police power, rather than including them with other buildings in a slum clearance project and paying compensation under eminent domain on the income-producing value of the property.

Under the program of planning assistance grants to small communities and to metropolitan and regional areas, more than \$1,250,000 had been granted by Sept. 1956 to state agencies for aid to 203 small communities in 12 states and 5 metropolitan or regional areas in 3 states, and to 11 metropolitan or regional agencies direct in 8 states.

(See also CIVIL DEFENSE, U.S.; TOWN AND REGIONAL PLANNING; URBAN TRANSPORTATION, U.S.; also under individual large cities.) (L. GU.; A. M. DS.)

Canada.—Estimated revenues of Canadian municipalities, excluding special purpose grants in excess of \$60,000,000, rose from \$907,000,000 in 1954 to \$957,000,000 in 1955, an increase largely attributable to real property taxes which in turn rose from about \$703,000,000 to \$754,000,000. Provincial education grants at \$199,000,000 (not included above) were \$25,000,000 higher than in 1954. Debenture borrowings were in excess of \$258,000,000 in 1954, and \$293,000,000 in 1955, while aggregate outstanding debt in the same years rose from \$2,192,000,000 to \$2,412,000,000. An unusually high demand for funds throughout the economy since midyear 1955, coupled with monetary policies designed to restrain the expansion of credit, contributed to increased municipal borrowing costs by as much as 1½% and 2% by Nov. 1956. The effects were seen in stretched-out capital programs, the uneven character of marketings and recourse to borrowings in the United States.

In the first nine months of 1956, U.S. borrowings of Canadian municipalities reached an estimated \$84,000,000, compared with \$40,000,000 in the same period in 1955, and \$26,000,000 in 1954. Demands continued that more costs and functions, particularly in education and welfare, be assumed by provincial governments. Trends to metropolitan government continued under pressure of urban growth and its dispersion and the desire to broaden fiscal bases and adopt modern administrative techniques developed by private business and suited to large-scale organization.

Further integration of services in metropolitan Toronto's 13 constituent municipalities was achieved in 1956 by the creation of a unified police force and a single licensing commission. In Alberta, a royal commission in 1956 recommended metropolitan development of Calgary and Edmonton by amalgamation with fringe municipalities, and proposed mandatory membership in district planning commissions. By 1956, seven counties had been organized in rural Alberta, combining in a central council the hitherto separate functions of local governments, school boards and, for the most part, hospital districts. A parallel development in the province had been the creation, largely since 1953, of about 50 coterminous boundary areas in which municipal and school district boundaries were made to coincide. (M. O'C.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*The Baltimore Plan* (1953); *Cities—How They Grow*, 2nd ed. (1953); *City Water Supply* (1941); *Defending the City's Health* (1941); *The Living City* (1953).

Munitions. U.S. Army.—A listing of the United States army's munitions items of interest for the year 1956 follows:

Aircraft Detector.—An electronic aircraft detector, so light and compact it can be hooked onto a helmet, was unveiled by the air research and development command. It is for use primarily by the ground observer corps to spot low-flying enemy aircraft.

Anti-Tank Weapon.—This new $8\frac{1}{2}$ -ton weapon is armed with six 106-mm. recoilless rifles and a calibre .30 machine gun. It also carries four calibre .50 spotting rifles. Known as Ontos, the vehicle was designed for direct sea-to-land invasion. It has a top speed of 40 m.p.h. and can climb a 60% slope.

Automatic "Brain."—The air force and Hughes Aircraft company announced the development of an electronic system which flies interceptor aircraft automatically from take-off to touch-down and which can accurately seek out enemy bombers before they strike their targets. The pilot's only function in the new, almost completely automatic system is to take off and land the aeroplane.

Bridge Trailer.—A special trailer was developed by the corps of engineers' Research and Development laboratories, Fort Belvoir, Va., to transport and launch a complete bay of the army's new division floating bridge. Towed by a standard five-ton bridge truck, it features a tilting bed with rollers which facilitate the launching of an assembled bay into the water.

Cargo Carrier.—A new five-ton eight-by-eight cargo carrier designed and manufactured for army ordnance by Reo Motors, Inc., had a novel wheel arrangement, which, with steering action on the four front wheels, facilitates cross-country manoeuvrability.

Electric Rail Cutter.—A portable electric rail cutter was developed by the Ty-Sa-Man Machine company to expedite the construction and repair of military railroads.

Flying Carpet.—The army, envisioning a new concept in battlefield mobility, unveiled its own flying carpet—a 200-lb. Aerocycle that combines the principles of the helicopter and motorcycle. The 44-h.p. Aerocycle has two rotary blades under a stand-up perch that carries the infantryman to his destination. It has an estimated top speed of 65 m.p.h. and a range of 150 mi.

Hypersonic Gun.—A gun that fires projectiles at velocities 11 times the speed of sound was designed and built for the Aberdeen Proving Ground Ballistics Research laboratory by the Universal Winding company of Providence, R.I.

Jungle Destroyer.—A giant jungle destroyer called a "tree crusher," travelling on the largest rubber tires in the world, was developed by Le Tourneau-Westinghouse. Designed to uproot heavy trees and underbrush, the six-wheeled Goliath has three times the wallop of an M-24 tank yet has such light ground pressure that it can roll over a pocket watch without damaging it. The wheels of the machine are 4 ft. wide and 10 ft. tall.

Landing Craft Retriever.—A diesel-electric-powered landing craft retriever, developed for the transportation corps by Le Tourneau-Westinghouse company, straddles and picks up damaged landing craft in water as deep as eight feet and brings it safely to shore over grades as steep as 20%.

Locomotive.—At a ceremony in Washington, D.C., on July 14, 1956, the first U.S. diesel-powered mechanical hydraulic transmission locomotive produced for military use was formally accepted by the department of the army. The 48-ton experimental locomotive has a diesel-mechanical power plant instead of the familiar diesel-electric system.

Long-Range Radio.—An army Jeep radio with a range of up to 2,000 mi. was developed by the signal corps Engineering laboratories, Fort Monmouth, N.J.

Miniature Magnetron Tube.—The world's smallest continu-

ous-wave, self-contained magnetron tube, 50 times more powerful than the tube it would replace, was designed and constructed at the signal corps Engineering laboratories.

Miniature Walkie-Talkie.—The smallest walkie-talkie FM radio ever built, this transistorized instrument is tiny enough to be carried in a shirt pocket or strapped to a helmet, yet powerful enough for two-way communication over $\frac{1}{4}$ -mi. range.

Ninety-Millimetre Self-Propelled Air-Borne Gun.—The T-101 90-mm. self-propelled anti-tank gun has a light, tanklike body with a hull built entirely of lightweight metals. Its light weight enables it to traverse muddy, marshy or sandy terrain and snow and permits it to be air-dropped.

Portable Television Transmitter and Receiver.—Under the supervision of the televisual branch of the army signal corps Engineering laboratories, the Radio Corporation of America built an 8-lb. hand-held television camera and a 47-lb. back-carried transmitter for use on the battlefield.

Radiation Test Cell.—A new chamber for the study of atomic radiation was being constructed for the air research and development command at Dayton, O. The new facility, called a radiological hot cell, would be used by Wright Air Development centre engineers to study materials or equipment that had been placed in an atomic reactor and were themselves radioactive, and it also would enable them to subject materials or equipment to radiation.

Shock Absorber.—A collapsible rubber bag that resembles a barrel was developed by the Firestone Tire and Rubber company to absorb the landing shock in parachute drops of heavy weapons and equipment. In use, four to ten of the cushions are placed underneath a magnesium pallet carrying up to 25,000 lb. of equipment.

Test Projectile.—A new artillery projectile made of paper and water was developed by the army in order to provide an inexpensive shell for test firing. Made initially only for the 105-mm. howitzer, the new shell costs about \$1. Its weight and resistance to the expansion of the propellant gases make it possible to test operation of the howitzer's recoil system.

Tiny Repeater.—A cheap and easy-to-use device that lets a combat soldier talk for more than 30 mi. over his field telephone was being perfected at the army signal corps Engineering laboratories.

Transistor.—A new type of transistor, claimed to be ideally suited for guided missiles and for more efficient electronic brains, was revealed by the Bell Telephone laboratories.

Voice-Powered Radio.—The power of the human voice was tapped by the army signal corps Engineering laboratories to operate a new radiotelephone device. Completely independent of wires and batteries, the voice-operated equipment weighs only $1\frac{1}{2}$ lb. and continues to operate as long as the user keeps talking into it. (R. S. T.)

Guided Missiles.—The year 1956 saw considerable progress in guided missile development and production, a \$2,000,000,000 item in the department of defense budget. Where, at the close of 1955, there had been only eight missile types in production, by the end of 1956 there were more than a score, and seven of them were in actual operational service.

The major development of 1956 was an increased emphasis on the intercontinental ballistic missile. The budget for the fiscal year 1957 (July 1, 1956–June 30, 1957) called for an expenditure of more than \$600,000,000 on this single development item, an increase of about 50% over the previous year.

The air force announced in 1956 that it was starting work on a second intercontinental ballistic missile project known as Titan, to be developed by the Glenn L. Martin company at its Denver (Colo.) division. It was felt that a second project, employing a different technical approach, would speed development of the

imate weapon."

Convair division of General Dynamics corporation started construction of a special plant for its SM-65 Atlas, the first of the intercontinental ballistic missiles. The \$41,000,000 plant, located near La Jolla, Calif., was expected to be ready for full operation in the fall of 1957. Meanwhile, Convair continued development of the Atlas at its San Diego, Calif., plant while the U.S. air force started construction of a launching site for the missile at its missile test centre at Patrick air force base, in Florida. First firings were expected in mid-1957, although the missiles would not have the ultimate range.

While rapidly developing its offensive capability, the U.S. air force was also considering the defense. Although it was at first believed that there would be no defense against an 18,000-m.p.h. ballistic missile, the U.S. air force had let at least three study contracts for "antimissile missiles," about which little had been disclosed.

As an intermediate measure, the department of defense also placed considerable emphasis on the intermediate-range ballistic missile, which would be capable of flying 1,500-2,000 mi. Under air force cognizance, Douglas Aircraft company started development of one such weapon, named Thor, while the army and navy jointly began work on a similar missile, the Jupiter C (one of several models of the Jupiter missile). Development status of the new projects remained secret.

The following is a round-up of U.S. missile types in service, production or development:

Surface-to-Surface.—In addition to Titan, Thor and Jupiter three other new missiles made their appearance, all army artillery types. The army made first test firings of the Dart, an anti-tank powder rocket developed by Aerophysics Development corporation. Douglas Aircraft started development of Little John, an improvement of the army's unguided close support rocket, the Honest John. Also in an early stage of development was the army's Sergeant, an advancement of the Firestone Corporal, a 100-mi.-range artillery missile.

Among the older types remaining in production were the pilotless bombers, the Martin Matador (U.S. air force) and the Chance Vought Regulus (navy); the short-range (about 200 mi.) ballistic missile Redstone, being built by Chrysler Corp.; the Firestone Corporal and the Honest John. Development was continued on the Northrop Snark and North American Navaho, the air force air-breathing long-range missiles of the pilotless variety. Martin also continued development of the close support rocket LaCrosse for the army and marine corps.

Air-to-Air.—Douglas was working on a new missile in this category, the Ding-Dong, which would carry an atomic warhead for use against attacking bombers. The Hughes Falcon joined the operational inventory; it was used in the Convair F-102 interceptor which started into service with the air defense command during 1956. Douglas Sperry continued to turn out Sparrow missiles, in three different versions, for the navy. Philco Corporation prepared for production of its Sidewinder (navy), a type similar to the Falcon.

Surface-to-Air.—Joining the list of production missiles was the Talos, built by McDonnell Aircraft corporation, a ramjet-powered missile which the air force also planned to use for base defense. In wide service use and in full production was the much-improved Nike (Douglas), and Nike B, a longer-ranging version, being readied for production. Also being built in quantity were the army's Loki (East Coast Aeronautics) and the ship-defense missile Terrier, built for the bureau of ordnance by General Electric. In development was an advanced version of the Terrier, known as the Tartar, and Raytheon's Hawk, about which nothing was disclosed.

The Boeing Airplane company started test firings of the long-range



THE SIDEWINDER, an air-to-air missile developed by the U.S. navy and tested by the Mediterranean fleet in 1956. Planned for defensive purposes, the missile was capable of destroying fighter and bomber planes at altitudes from sea level to 50,000 ft. Pilot standing beside missile wears high altitude flight suit

(200 mi.) ramjet interceptor Bomarc, which was not yet ready for introduction to service.

Air-to-Surface.—Fairchild Engine and Airplane corporation started production of its Petrel, an antisubmarine weapon launched from a plane like a guided aerial torpedo. The Petrel could be used either as an air-to-surface or air-to-underwater missile. Fairchild also started development of the Goose, a similar type of advanced design. Both are propelled by low-powered expendable jet engines. Also in production were Eastman Kodak's Dove (navy) and Bell Aircraft's Rascal, both designed for launching from aircraft at surface targets. Still in development was a similar type known as the Martin Bullpup (navy).

(J. J. HY.)

U.S. Navy.—Progress continued at an accelerated pace during 1956 in the development and production of new weapons by the U.S. navy. Increased funds appropriated for research and development were utilized primarily on guided missile and special weapons programs. Funds for production and procurement of naval armament also increased, a reversal of the downward trend of the previous two years. Procurement of so-called conventional weapons continued to decline.

The world's first guided missile cruiser, U.S.S. "Boston," com-

missioned in 1955, proved in fleet tests and public demonstrations the deadly striking power of the supersonic rocket-propelled anti-aircraft missile Terrier. A second guided missile cruiser, U.S.S. "Canberra," also equipped with Terrier, joined the fleet. Construction was started on a new guided missile destroyer, the U.S.S. "Gyatt," to launch Terrier.

Terrier's weapons control equipment automatically evaluates the threat of approaching targets and selects the units to engage them. The launching equipment automatically selects the missiles to be fired, loads them onto the launchers and points them in the direction ordered by the fire control equipment. After Terrier is fired, radar guides the missile to its target.

The marine corps organized its first anti-aircraft missile battalion using a land-based Terrier launching system.

A second surface-to-air guided missile, Talos, larger and more powerful than Terrier, proved in tests that it is a highly effective long-range weapon against aircraft. Prototype production of the missile was completed at the Naval Industrial Reserve Ordnance plant, Mishawaka, Ind., operated by Bendix Aviation corporation. Work was under way on fire control and launching components for shipboard installation of Talos. Conversion of the light cruiser U.S.S. "Galveston" to a guided missile ship for launching Talos was started.

Development of a third surface-to-air guided missile, Tartar, progressed satisfactorily. A solid-propellant rocket, Tartar is smaller than Terrier. The missile would be used in destroyers and as the secondary battery for large ships.

The transsonic surface-to-surface missile Regulus, powered by a turbojet engine, became fully operational in the fleet from both submarines and several types of surface ships.

Joint development by the army and navy was initiated on the intermediate-range ballistic missile Jupiter, which would be capable of being launched from both ship and land.

Significant progress was made in the field of air-launched guided missiles, with three being released to the fleet for operational use.

An attack squadron on board the carrier U.S.S. "Intrepid" was equipped with the air-to-air missile Sparrow I. Other carriers, including the U.S.S. "Forrestal," were scheduled to have Sparrow I-equipped aircraft.

Sparrow I, powered by a solid-propellant rocket motor, reaches a speed of 1,500 m.p.h. within seconds after launching. Launched from jet fighters against high-speed aircraft and other missiles, guidance signals deflect Sparrow I's wings and direct it to intercept the target, even under evasive action.

A second air-to-air missile, Sidewinder, developed at the Naval Ordnance Test station, China Lake, Calif., was also placed in operational use in the fleet. This was one of the simplest and least expensive guided missiles developed. Evaluation tests proved it extremely effective against high-performance aircraft.

The air-to-surface Petrel, designed primarily for use against enemy ships at sea, became operational and gave patrol aircraft a new offensive power. Outfitting with Petrel of selected squadrons in both the Atlantic and Pacific fleets was begun. Launched from well outside the range of the target's air defense, Petrel would save plane and pilot from the hazards of anti-aircraft fire. Petrel is one of the navy's more complex guided missiles, both electronically and dynamically, with an intricate electronic brain which enables the missile to think its way to the target.

Considerable research and development effort was placed on the underwater ordnance program. A guided missile nuclear-powered submarine was included in the 1956 shipbuilding program. Emphasis continued on development of small, low-cost, high-speed torpedoes that could be launched from aircraft, submarines or surface vessels. A new air-drop torpedo was in production, and an experimental high-speed torpedo was in prototype

production.

Development, production and procurement programs for atomic naval weapons were under way.

Despite the emphasis on development and production of guided missiles and nuclear weapons, naval preparedness for any type of emergency must also depend upon conventional weapons. Substantial improvements were made in the design of critical components of gun mounts and fire control systems. Two completely automatic anti-aircraft guns, the five-inch .54-calibre and three-inch .70-calibre, were evaluated and approved for fleet use. A new air-to-air and air-to-ground rocket reached fleet evaluation stage.

Flakelol I, a nonstrategic magnetic core material, was developed by the U.S. Naval Ordnance laboratory, White Oak, Md., for use in electronic filters and communications systems. The new material has higher permeability, lower eddy current losses and lower density than the high nickel content alloys previously used in magnetic powder cores.

A dry lubricant, Teflon, was studied and evaluated for use in rifles, torpedoes, machine guns and missile parts. Teflon's low coefficient of friction eliminated previous difficulties in operation of many types of weapons. (F. S. W.)

(See also ARMIES OF THE WORLD; ATOMIC ENERGY; AVIATION; MILITARY; JET PROPULSION; NAVIES OF THE WORLD.)

Muscat and Oman. This is a sultanate in close treaty relationship with Great Britain, occupying regions extending northwest and southwest from the most easterly point of Arabia, together with an enclave in Trucial territory stretching southward for about 45 mi. from Cape Musandam. Total area: about 82,000 sq.mi.; pop. (1955 est.) 550,000, including many Baluchis, western Indians and Negroes in chief towns and on the coast. The dependency of Gwadar, an enclave on the south coast of Makran (Pakistan), comprises a port (pop. about 6,000) and about 300 sq.mi. of adjoining country. Chief towns (1954 est.): Muscat (cap.) 3,500; Matrah 8,500. Sultan, Said bin Taimur.

History.—The sultan of Muscat and Oman returned to his capital city, Muscat, early in Jan. 1956 after travelling through territories over which his sovereignty had been forcefully reasserted, with the British government's approval. By removing the pro-Saudi imam of Oman the sultan unified his domain and gave it a cohesive administration which it had not had for a long time.

Drilling by the Iraq Petroleum company was vigorously pursued in Oman but at a depth of more than 4,000 ft. oil had still not been found. (E. S. AH.)

Museums. **United States.**—Museums during 1956 offered new exhibits and activities designed to give deeper pleasure and understanding. To illustrate the typical operations of a railway, the Franklin institute, Philadelphia, Pa., began the installation of an H-O gauge working model with 800 ft. of track, 300 cars and 30 locomotives. A moving mural, 90 ft. long which showed in turn the characteristic animals of the more recent geological periods, highlighted the fossil mammals hall in the Carnegie museum, Pittsburgh, Pa. Visitors to the University of Oklahoma museum, Norman, were able to look at an exhibit of birds and at the same time hear the bird calls over a telephone receiver. With other exhibits they could listen to Indian music or the sounds of a tropical forest. Similarly, in the new museum at Petersburg National Military park, in Virginia a diorama of the interior of a soldier's hut could be studied while listening to a letter which had been written home by a soldier. The National museum, Washington, D.C., modernized its exhibits with the opening of the Birds of the World hall and a series of

displays tracing the history of iron and steel in America. The Metropolitan Museum of Art, New York city, completed the installation of its splendid collection of European arms and armour in ten galleries, while the Milwaukee (Wis.) Public museum opened an oceanic hall illustrating the life and culture of Pacific islands. The mediaeval hall of the Virginia Museum of Fine Arts, Richmond, was finished. In Philadelphia the Commercial museum reopened after extensive remodelling of its building and revision of its exhibits, and the St. Augustine (Fla.) Historical society also installed a complete new set of exhibits.

Museums provided unusual educational activities for children and adults, specialists and the general public. At a dinosaur night at the Chicago Natural History museum visitors saw new exhibits and motion pictures of dinosaur fossils. The Museum of Fine Arts, Houston, Tex., organized a fine arts forum on the American heritage and the southwest. The Wedgwood International seminar held by the Philadelphia Museum of Art gave experts and collectors opportunities for discussions on Josiah Wedgwood and his pottery. The Springfield (Mass.) Museum of Fine Arts conducted a seminar on the economics and design of merchandise packages, accompanied by a special exhibition of packaging. A month-long institute of the maritime history of the United States was offered by the Marine Historical association at its Mystic (Conn.) seaport restoration. The American Museum of Natural History, New York city, organized a study tour

Mexico and Central America for travellers with scientific interests. The Boston (Mass.) Museum of Fine Arts and Tufts University offered a four-year undergraduate course in the fine arts, while the Metropolitan Museum of Art collaborated with New York university in a graduate course to train curators. To make their special exhibitions better and to conduct them more efficiently, 12 art museums formed a Museum Exhibitions association to assemble and circulate temporary shows among the group.

Museums carried on various important research projects. Colonial Williamsburg (Va.), at a cost of \$500,000, began a five-year study of life in 18th-century America. The American Museum of Natural History and New York university started a three-year investigation of sedimentation in Long Island sound, and in Philadelphia, 50,000 specimens of deep-sea molluscs were added to the research collections of the Academy of Natural Sciences. The Philadelphia Museum of Art acquired a collection of geographic art by John Sloan illustrating his development.

Museums continued to build. The Seattle (Wash.) Art museum and the Brooks Memorial Art gallery, Memphis, Tenn., completed additions, while the Atlanta (Ga.) Art association opened its new buildings. The Los Angeles (Calif.) Municipal Art gallery designed by Frank Lloyd Wright was dedicated, and construction started on his building for the Solomon R. Guggenheim museum in New York city. Congress appropriated \$33,712,000 to build a museum of history and technology for the Smithsonian institution, Washington, D.C. The national park service began its ten-year Mission "66" program which included plans for about 100 new visitor centres in the parks, each to contain a small museum. (See also SMITHSONIAN INSTITUTION.)

(R. H. LS.)

Accessions to Art Galleries and Art Museums.—Mr. and Mrs. Robert Sterling Clark put on display in their museum at Williamstown, Mass., 50 paintings by ten 19th-century French artists. Another area of their vast but previously scarcely known collection may now be seen in ten canvasses by J. B. C. Corot, and by Edgar Degas (including the notable "Entrance of Masked Figures") and others by Gustave Courbet, Camille Pissarro and Henri de Toulouse Lautrec.

At the National Gallery of Canada at Ottawa, four great paintings were purchased from the Liechtenstein collection.



SUNBURST CONSTRUCTION AND SCULPTOR, Richard Lippold. The gold wire design was commissioned by the Metropolitan Museum of Art, New York city, and completed for exhibition in 1956. More than two miles of wire, and 14,000 hand-welded joints were used in the construction, the full title of which is "Variation Within a Sphere, No. 10: The Sun"

These were "St. Catherine" by Simone Martini, "The Entombment" (1614) by Rubens and two exquisite paintings by Jean Baptiste Chardin, "The Governess" and "The Return From Market," both painted in 1739. Considered the greatest family collection in the world, this remarkable assemblage of art objects was started by the princes of Liechtenstein in the 15th century.

Claude Monet, the great French Impressionist painter, came into prominence as one of his huge late water lily paintings was acquired by the Museum of Modern Art and another one by the Art Institute of Chicago.

A rare Etruscan bronze figure of a woman dating from about 440 B.C. was purchased by the Fogg Art museum at Harvard university. A remarkable 8th-century Indian Buddha went to the Seattle Art museum, purchased from the Margaret E. Fuller fund.

From the duke of Beaufort the Metropolitan Museum of Art purchased a remarkable Roman sarcophagus of the 3rd century A.D. Around three sides are figures in high relief representing Dionysus, the four Seasons and the bounty of Nature.

The Baltimore Museum of Art acquired a rare collection of 200 objects of oceanic art, the gift of Mr. and Mrs. Alan Wartzburger. Masks, figures, shields, jewelry and other objects illustrate with amazing completeness this fascinating primitive culture.

As a bequest from Curt Valentin, the Minneapolis Institute of Arts received four important German paintings, Ernst Kirchner's "Modern Bohemia," Lyonel Feininger's "Hopfgarten," Max Beckmann's "Mountain Landscape, Bavaria" and Emil Nolde's "Heavy Seas at Sunset." They also acquired "Dining Room in the Country" (1913), an important painting by Pierre Bonnard.

An important English painting, "Dell in Halmington Park" by

John Constable, went to the William Rockhill Nelson Gallery of Art in Kansas City, which also acquired a marble bust of Benjamin Franklin (1768) by Jean Antoine Houdon.

The City Art museum, St. Louis, acquired a remarkably fine Frans Hals, "Portrait of an Unknown Woman," painted 1648-50, formerly owned by Count Maurice Zamoyski of Warsaw.

In memory of Curt Valentin, a group of friends presented to the Museum of Modern Art Auguste Rodin's monumental bronze of Balzac.

A "Fête Champêtre" by Jean Baptiste Joseph Pater was the gift of Mr. and Mrs. William D. Vogel to the National Gallery of Art in Washington, D.C.

A rare Spanish still life (c. 1605) by Juan Sanchez Cotan was the gift of Mr. and Mrs. Leigh Block to the Art Institute of Chicago.

Mr. and Mrs. Ralph Cohn, New York, presented to the Smith College Museum of Art at Northampton, Mass., a marble torso by the French sculptor Hans Arp, a significant recent piece completed in 1953.

The Newark museum through its members' fund purchased an important work of the 18th-century American painter John Hesselius (1728-78), the "Portrait of Mrs. Richard Sprigg."

The Metropolitan Museum of Art paid a tribute to contemporary art by commissioning the United States sculptor Richard Lippold to make for it a giant construction in fine gilded wire. This extraordinary piece, entitled "The Sun," is remarkable not only for the intricacy of its craftsmanship but for the compelling, awe-inspiring effect on the spectator. (F. A. Sw.)

International.—A milestone was reached in 1956 in the annals of museums with the celebration of an "International Campaign for Museums" which took place during October. A strange and colourful poster heralded the campaign throughout the world and in many countries new museums were opened and special activities were organized. The fourth triennial conference of the International Council of Museums was held in Switzerland in July. About 300 delegates attended.

Great Britain.—Although the total grants to the national museums in the civil estimates showed a net increase of about £90,000 and this allowed for an intake of 80 further members of staff, the lot of the local museums continued to deteriorate. One exception was the Bowes museum at Barnard castle whose financial future was guaranteed by the Durham county council. The appeal to the government for assistance by the Museums association, the Arts council and the Carnegie United Kingdom trust, submitted at the end of 1955, was rejected.

A report prepared by a working party appointed by the National Institute of Adult Education stressed the total inadequacy of provision made for museums from public funds both nationally and locally and encouraged the closer association of museum administration with that of public education. The third report of the Reviewing Committee on the Export of Works of Art made strong recommendations to the government that the level of purchase grants to national and local collections be raised and that a fund be established for emergency purchases.

At Stoke-on-Trent, Staffordshire, the first large museum to be built in Great Britain since before World War II was opened to house the City Museum and Art gallery's collection. Several new galleries were reopened at the City Museum and Art gallery, Plymouth; and at the Fitzwilliam museum, Cambridge, the Lower Marlay gallery was redecorated as the permanent home of the museum's porcelain collection.

The Museums association held its annual conference in conjunction with the Dutch Museums association in Amsterdam, Neth. A scheme for the extension of the museums diploma to South Africa was established and an architecture committee was set up to advise on museum design and equipment.

Commonwealth.—In Australia new galleries were opened at the Museum of Applied Science, Victoria, including a bay devoted to atomic physics, and the Victoria government supported a scheme for a further extension to the museum. The Royal Ontario museum, Toronto, was reorganized under a single director. New museums in Canada included the Alexander Graham Bell museum at Baddeck, N.S., and the United Counties museum at Cornwall, Ont. The Glenbow foundation of Calgary was established at Alberta to assist museums and support research in archaeology and history. In New Zealand work was begun on the extension to the Auckland War Memorial museum, estimated to cost £370,000.

In Ceylon funds were established for the publication of an atlas of antiquities, of which the four national museums contained a rich collection. In Pakistan a science gallery and an educational museum were opened at Lahore and the Abasin Art centre was established at Peshawar. Under the supervision of the curator of the Sarawak museum plans were laid for the development of museum facilities in Brunei and North Borneo. In South Africa plans were made for the establishment of an open-air museum of South African history at Pretoria.

Europe.—In Austria five more galleries were opened at the Museum of Army History in Vienna. Progress was made on the new building for the Historical museum, and at the North Austrian State museum a museum of Danube culture was opened and the collection of the historic *Rechtsaltertümer* was rearranged. New museums opened in Bulgaria at Sofia, Perushitsa, Russé, Vratsa, Nesebar and Pliskov. In France a new museum opened at Grignan and new galleries were completed in museums at Autun and Bourges. Many provincial museums and galleries were reopened.

A museum of Chinese art opened in Budapest to house examples of ancient, modern and applied Chinese art. New museums were established in Italy at Rome, Milan, Palestrina, Brescia, Velletri and Capua. In the Netherlands the Singer Memorial museum was opened at Laren and new galleries were completed at the Historical museum, Rotterdam. In Norway a maritime section was opened at the Borgarsyssel museum, the district museum of Östfold. A new museum building was opened at Jönköping, Swed., and an annex for contemporary art was completed at the National museum in Stockholm.

Asia.—A national museum of history and culture was opened in Taiwan (Formosa). In Indonesia plans were put forward by the United Nations Educational, Scientific and Cultural organization for the creation of a national museum.

Middle East.—One of the city gates of Nineveh, the Nergal gate, was restored to serve the ancient capital as a small local museum. Prehistoric stone implements were added to the collection of the Iraq museum through excavations in the Zagros mountains.

(See also ART EXHIBITIONS; ART SALES.) (M. D. N.)

Musial, Stanley Frank (1920—), U.S. baseball player who was voted "player of the decade" in 1956, was born at Donora, Pa., on Nov. 21. After graduation from high school he joined the St. Louis Cardinals farm system, playing first for Williamson, W. Va., in the Mountain States league. In 1941, after several more seasons in the minors, he was called up by the Cardinals late in the season and was a major factor in the Cardinals' world championship victory the following year. Except for military service in 1945-46 he remained thereafter with the Cards, becoming one of the great baseball stars of all time. Prior to his selection as outstanding player of the decade, Musial had been named most valuable player in the National league three times (1943, 1946 and 1948), and had led the league in batting six times (1943, 1946, 1948, 1950, 1951 and 1952). In 1956 Musial also established a new

national league record for extra base hits, exceeding the old mark of 1,071 set by Melvin T. (Mel) Ott of the New York Giants between 1926 and 1947.

Classical.—The year 1956 passed under the sign of music. Mozart, for it was the bicentennial of his birth. All over the world, opera houses, symphony orchestras and chamber music organizations offered performances of Mozart's music; in Salzburg, his birthplace, the festivities continued throughout the year. Many little-known works by Mozart were revived and performed on special occasions.

The international exchange of musical organizations reached its peak in 1956. European symphony orchestras travelled from one country to another with a facility formerly attainable only by individual artists. The Berlin Philharmonic orchestra made its second U.S. tour under the direction of its permanent conductor, Herbert von Karajan, in the autumn. The Vienna Philharmonic orchestra gave concerts in the United States later in the year. The New Orleans orchestra, directed by Alexander Holsberg, made a highly successful tour through Latin America. At the most spectacular event in orchestral travels was the extensive European tour of the Boston Symphony orchestra, under the direction of Charles Munch and Pierre Monteux, culminating in a series of concerts in Leningrad and Moscow early in September. This was the first time that an American symphony orchestra had visited the U.S.S.R.; the artistic success was tremendous. At its concerts in the Soviet Union, the Boston Symphony presented works by the U.S. composers Walter Piston, Aaron Copland and Paul Creston, which were heard with interest by the Russian audiences.

Previous to the concerts of the Boston Symphony orchestra, the U.S.S.R. heard George Gershwin's opera *Porgy and Bess*, performed by an all-Negro cast from the United States. The final performance took place at the Leningrad Palace of Culture on Dec. 26, 1955. The authentic presentation of this U.S. opera aroused enormous interest and produced a deep impression on Russian musicians, to judge by the accounts in the Soviet press.

Festivals of modern music were prominent during the year. The 30th annual music festival of the International Society for Contemporary Music (I.S.C.M.) took place in Stockholm, Sweden, from June 3 to June 10. Twenty-six works from 19 countries were given, and a concert of Swedish works was also presented. The growing interest in the method of composition known as dodecaphonic (the 12-tone system) was reflected in this festival; 17 works were composed in this technique.

The first program of the I.S.C.M. festival comprised the following works: *Concerto da Camera* for flute, English horn and string orchestra, by Arthur Honegger; *Suite* for brass instruments, percussion and string orchestra, by Rudolf Kelterborn (Switzerland); *Thirteen Sketches for Thirteen Instruments*, by Jean Radic (Yugoslavia); *Sinfonia da Camera*, by Sven Erik Bick (Sweden); *El Amor Pasa* for soprano, flute and chamber orchestra, by Ahti Sonninen (Finland); and *Triple Concerto* for flute, clarinet and bassoon, by Niels Viggo Bentzon (Denmark).

The second concert of the I.S.C.M. festival was devoted to chamber music. It included the *Second String Quartet* by Henri Dutilleul (France); *Kontrapunkte* by Karlheinz Stockhausen (Germany); a chorale motet by Anton Heiller (Austria); *Wind Quartet* by Finn Mortensen (Norway); *Violin Sonata* by the 22-year-old composer Torarinnsonn Leifur (Iceland); and *Sixth String Quartet* by Hilding Rosenberg (Sweden).

The third concert of the I.S.C.M. festival included the following works: *Variations* by Barry Moss (New Zealand); *Ectophrase* for electric instruments, percussion and string orchestra by Shiroshi Mayuzumi (Japan); *Idyll of Theocritus* for soprano

and orchestra by Roger Sessions (U.S.), originally commissioned by the Louisville orchestra and performed by that organization earlier in the year; *Violin Concerto* by Mario Peragallo (Italy); and *Fourth Symphony* by Guillaume Landré (Netherlands).

The fourth concert of the I.S.C.M. festival consisted entirely of Swedish music; *Ritornello for Orchestra* by Ingvar Lidholm; *Cantata* by Hilding Hallnas; *Missa Brevis* for three-part chorus by Lars Erik Larsson; and *Sinfonia Espressiva* by Gosta Nyström.

The fifth concert of the I.S.C.M. festival presented chamber music works: *Second String Quartet* by Barbara Pentland (Canada); *Trio* for flute, oboe and bass clarinet by Joaquín Homs Oller (Spain); *Psalm VIII* for soprano, flute, cello and piano by Luigi Cortesi (Italy); *Elegia Appassionata* for piano, violin and cello by Giseler Klebe (Germany); and *Second String Quartet* by Alan Rawsthorne (Great Britain).

The sixth concert of the I.S.C.M. festival contained the following orchestral works: *Sinfonia Concertante* by Hanns Jelinek (Austria); *Violin Concerto* by Benjamin Frankel (Great Britain); *Music for Orchestra* by Marcelle de Manziarly (France); *Piano Concerto* by Alexei Haieff (U.S.); and *Pampeana No. 3* by Alberto Ginastera (Argentina).

The annual International Festival of Music in Venice (Sept. 11 to Sept. 23) attracted a great deal of attention because of the world première of a new sacred work by Igor Stravinsky bearing the Latin title *Canticum Sacrum ad Honorem Sancti Marci Nominis* ("Canticle to Honour the Name of St. Mark"), conducted by the composer at St. Mark's basilica. This work exploits the techniques of both mediaeval and ultra-modern music. The scoring suggests old instrumental sonorities, and the Latin text enhances this archaic impression, but the structure of the music is based on a serial progression of notes serving as a theme, a procedure related to the 12-tone method of composition.

Other works given at the Venice festival included *Symboli Chrestiani* for baritone and orchestra by Nicolas Nabokov; *Suite Concertante* for violin and orchestra by Bohuslav Martinu;

CANADIAN PRODIGY, 23-year-old Glenn Gould of Toronto, recording at a New York city studio in March 1956. His first record, the *Goldberg Variations* of J. S. Bach, was a classical best-seller



Concerto for harmonica and orchestra by Alexandre Tcherepnin; a work for wind quintet by Gian Francesco Malipiero; *Concerto Breve* for ballerina and orchestra by his nephew, Riccardo Malipiero; and a *Concerto* for piano and wind quintet by the American composer Wallingford Riegger. A concert of French choral music given at the Venice festival presented Henri Barraud's *Te Deum* and Daniel Lesur's *Cantique des Cantiques*.

The first International Festival of Contemporary Music was given in Warsaw, Pol., from Oct. 10 to Oct. 21; 20 concerts were played, featuring modern works by Polish, Russian and western European composers. The Warsaw festival was remarkable in that it broke the ban on western modern music. Works by Stravinsky, Schoenberg, Alban Berg and other composers previously regarded as decadent were performed for the first time in eastern Europe. Contemporary Polish music was represented by Grazyna Bacewicz, Tadeusz Baird, Witold Lutoslawski, Artur Malawski, Kazimierz Sikorski, Stanislaw Skrowaczewski, Michal Spisak, Antoni Szalowski and Boleslaw Woytowicz. Three large works by Karol Szymanowski were also presented.

In Great Britain, musical activities were maintained by a number of orchestral and chamber music organizations. The annual Edinburgh festival (Aug. 19–Sept. 8) featured a variety of classical and modern works. The 31st Haslemere festival was given in July under the direction of Carl Dolmetsch; as in preceding years, programs were devoted to old European music, performed on modern reproductions of recorders, harpsichords, lutes and other instruments in use during the 16th, 17th and 18th centuries. The most remarkable single event of the British music year was the performance of the new *Eighth Symphony* by the dean of British composers, Vaughan Williams (Manchester, May 2).

In the United States, a festival of American music was given in February at the Juilliard School of Music in New York city, on the occasion of its 50th anniversary. It consisted of six concerts of specially commissioned works: a piano concerto by Roger Sessions (Feb. 10); cello concerto by Peter Mennin (Feb. 10); opera *The Wife of Martin Guerre* by William Bergsma (Feb. 15); *Diaphony* for brass, two pianos, organ and timpani by David Diamond (Feb. 22); *Festival Folk Fantasy* for chorus, folk singer and amplified piano by Roy Harris (Feb. 22); *Fifth Symphony* by Walter Piston (Feb. 24; the first performance of his *Sixth Symphony* preceded that of the *Fifth*; it was given by the Boston Symphony orchestra in Nov. 1955).

The 41st May Music festival at Cincinnati presented a varied series of concerts, including the world *première* of the cantata in ten movements *Images of Youth* by the resident composer, Felix Labunski.

The 12th Festival of Chamber Music in the Library of Congress at Washington, sponsored by the Elizabeth Sprague Coolidge foundation (Oct. 19–21), offered world *premières* of the following works: song cycles by Luigi Dallapiccola and Irving Fine; *Suite for Cello and Piano* by Paul Creston; *Violin Sonata* by Peter Mennin; *String Quartet* by Henry Cowell; and the madrigal-opera *The Unicorn, the Gorgon and the Manticore* by Gian Carlo Menotti.

Numerous other works of special interest were given for the first time in 1956: *Violin Concerto* by Miklos Rozsa (Dallas, Jan. 5); *Symphony in E Flat* by Ernest Bloch (London, Feb. 15); *Second Symphony* by the Chilean composer Juan Orrego-Salas (Minneapolis, Feb. 17); *Captain Lovelock*, opera by John Duke (New York, Feb. 20); *11th Symphony* by Heitor Villa-Lobos (Boston, March 2, composer conducting); *Fifth Symphony* by Paul Creston (Washington, April 4); *Second Symphony* by Gail Kubik (Louisville, April 7); *The Trial at Rouen*, opera by Norman Dello Joio (NBC-TV Opera Theater, April 8); *First Piano Concerto* by the American composer Benjamin Lees

(Vienna, April 26); *Pantaloone*, opera by Robert Ward (New York, May 17); *The Tempest*, opera after Shakespeare by Frank Martin (Vienna, June 17); *The Ballad of Baby Doe*, folk opera by Douglas Moore and John Latouche (Central City, Colo., July 7); *Second Symphony* by Ned Rorem (La Jolla, Calif., Aug. 5); *Fourth Piano Concerto* for piano left-hand and orchestra by Sergei Prokofiev (west Berlin, Sept. 5; posthumous performance); *Susannah*, opera by the U.S. composer Carlisle Floyd (New York, Sept. 27); *Incantation* for piano and orchestra by Bohuslav Martinu (New York, Oct. 4); *Portrait* for violin and orchestra by Bernard Rogers (Cleveland, Oct. 18). The *Third Symphony* by Ernest Toch was performed by the Pittsburgh Symphony orchestra on Dec. 2, 1955, and received the Pulitzer prize of 1956. *The School for Wives*, opera by the Swiss composer Rolf Liebermann, commissioned by the Louisville orchestra, was produced in Louisville, Dec. 3, 1955. (N. Sv.)

Popular.—Most of the popular songs of 1956 had little to recommend them artistically, and the best of them were either revivals from the past or imitations of tried and true materials. The Elvis Presley hysteria began with a rhythmic monstrosity called "Blue Suede Shoes" and continued through "Heartbreak Hotel" to the primitive "Hound Dog." Eventually "the Pelvis" arrived at a straightforward ballad, "Love Me Tender," which served as the title of his first motion picture and was copied note for note from the old "Aura Lee," also known as "Army Blue" and "The Violet." Meanwhile the "Rock 'n' Roll Waltz" was dominating "Your Hit Parade," with other hits making use of the same savage rhythm.

Of the old-timers, "The Yellow Rose of Texas" (published in 1858) held its own through the closing months of 1955, to be superseded by "Autumn Leaves," which profited by a film of the same name, and finally "My Prayer," written by Jimmy Kennedy and Georges Boulanger in 1939.

"Poor People of Paris" was a fairly good song with a French background, and the Italian influence was evident in "Whatever Will Be Will Be" ("Che Sera Sera"), which was topping the "Hit Parade" toward the end of the year. It may have been significant that the theme song from Kurt Weill's *Threepenny Opera*, generally known as "Moritat," became a solid success, even though its composer deliberately wrote it as a vulgar tune. A folklike song called "Sixteen Tons," popularized by Tennessee Ernie Ford, suggested a relationship with the ancient "Down in a Coal Mine." A pseudo-religious influence made itself felt in the reminiscent "The Bible Tells Me So."

Both motion pictures and television played a part in the development of hit songs for 1956. "Love Is a Many-Splendored Thing," from the film of the same name, won the motion picture academy award as the best screen song of the year, with a helpful background in "One Fine Day" from Puccini's *Madama Butterfly*. The top musical award of television went to "Love and Marriage," introduced in a telecast of *Our Town* and obviously based on the nursery jingle "Strut, Miss Lizzie." Two songs from the movie version of *Picnic* became popular, the original having the title "Moonglow," while the picture's theme was clearly derived from its harmonic sequence. "Lisbon Antigua" also had a screen background.

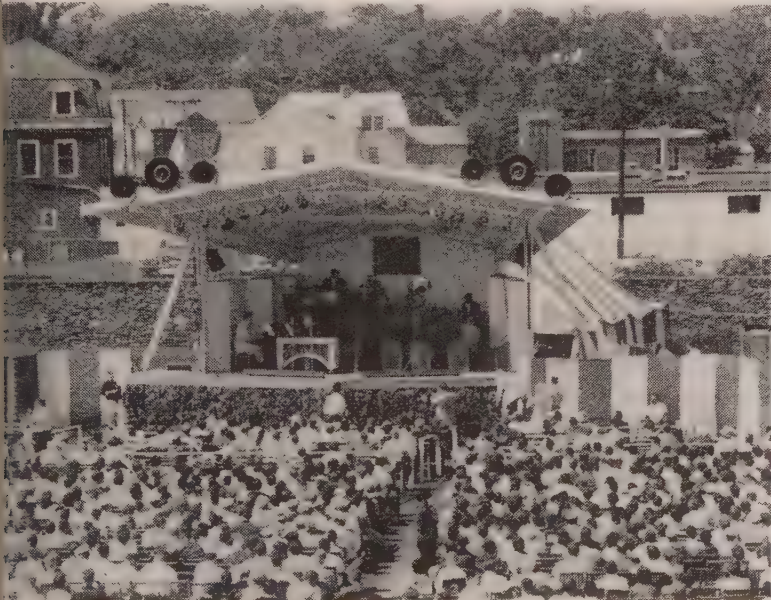
Two new musical shows stood out in 1956 and actually supplied some material for the "Hit Parade." *My Fair Lady* had a spectacular success, with Alan Jay Lerner and Frederick Loewe profiting by the Bernard Shaw play *Pygmalion*, as well as the performances of Julie Andrews, Rex Harrison and Stanley Holloway. At one time two songs from this musical comedy, "I Could Have Danced All Night" and "On the Street Where You Live," appeared simultaneously among the favorites. There was also "Standing on the Corner," from Frank Loesser's *The Most Happy Fella*, which, aside from this interpolation and a comic



Above: BROTHER MATTHEW, a friar of the Catholic order of the Servite Fathers, recording with a group of his former musical colleagues. Before joining the order the alto saxophonist was well-known as Boyce Brown

U.S. JAZZ MUSICIANS AT HOME AND ABROAD, 1956

Right: LOUIS ARMSTRONG (right) appearing before an enthusiastic crowd of Africans during a concert in the Gold Coast



Above: 1956 JAZZ FESTIVAL at Newport, R.I., a three-day program. In the photograph the Teddy Charles "tentet" entertains an afternoon session, July 7

Below: SWEDISH JAZZ FANS crowding around the bandstand to hear a solo by Frank Foster at a Stockholm concert by the Count Basie orchestra



Above: JOHN "DIZZY" GILLESPIE testing the reactions of a hooded cobra to his trumpet playing during his 1956 visit to Pakistan

Below: PARIS CONCERT by the Gerry Mulligan sextet. In the photograph: R. Brookmeyer, trombone; Mulligan, baritone saxophone; J. Cardley, trumpet



ditty about Dallas, came close to being an actual grand opera in Broadway terms.

Richard Rodgers, Cole Porter, Irving Berlin and other outstanding creators of popular music were conspicuously absent from the air and the best-seller lists. Before the year had ended, composers representing A.S.C.A.P. (the American Society of Composers, Authors and Publishers) and the Songwriters Protective association were suing Broadcast Music, Inc., for conspiring against publicizing their materials, and a congressional committee was investigating this agency of the National Association of Broadcasters as a possible monopoly in restraint of trade.

(S. SP.)

Music in Industry.—Functional background music successfully broke through the noise barrier in industry during 1956. Work music had been used in industry for nearly 18 years. However, noisy locations such as metalworking and fabricating plants and rooms with batteries of punch card, teletype and electric calculating machines presented a seemingly insuperable noise barrier to music. Noise builds up tension and anxiety in workers, causing fatigue and accidents, and affecting production adversely.

It had long been known that music tends to reduce or delay fatigue and consequently increases muscular endurance. Hence it was deemed important to bring the beneficial qualities of scientifically planned background music to workers in noisy areas.

Since most audible noise is in the low register, background music suppliers had relied on the broadest possible frequency range to make music audible at low volume over noise, a method only moderately successful. Muzak corporation, the pioneer in the field of industrial music, during 1956 demonstrated a newly perfected technique known as "controlled dynamics." In this the normally softer passages in the music are controlled so that they do not drop out of hearing behind the noise, and the passages of peak loudness are controlled to prevent "blasting," so that music not only penetrates but also masks out noise. "Controlled dynamics," coupled with wide frequency range recordings, proved successful in numerous factory installations. (X.)

Recordings.—In his short lifetime, Wolfgang Amadeus Mozart wrote more consummate masterpieces of music than any composer who lived before him or since. In 1956, the 200th anniversary of his birth, all those incomparable works of art were recorded in performances in the U.S. and Europe that would have been beyond the most hopeful dreams of the prodigious music maker from Salzburg. His opera *Don Giovanni* was sung and played by the soloists and chorus of the Vienna State Opera and the Vienna Philharmonic conducted by Joseph Krips with Caesare Siepi in the title role on the London label. *The Magic Flute*, conducted by Ferenc Fricsay, and the *Coronation Mass*, under Igor Markevitch, were on Decca, and a memorial performance of the *Requiem* sung in St. Stephen's cathedral in Vienna on the anniversary of Mozart's death was on Archive. The *Last Quartets*, the four final proofs of his genius with chamber works, were played by the Budapest quartet on Columbia, and on Epic the monumental *C Minor Mass* was recreated by the Vienna Symphony orchestra and chamber choir under Rudolf Moralt. Twenty-four of his songs were set forth most skillfully by Anny Felbermayer on Vanguard. Symphonies 32 and 40, the hallowed *G Minor*, were performed superbly by the Philharmonic symphony of London under Erich Leinsdorf for Westminster, and Symphonies 36, 39, 40 and 41, the *Jupiter*, were done with appropriate strength and insight by the Chicago symphony under Fritz Reiner. Insight and a way with wit were Reiner's qualifications for leading a chamber group through the rollicking parody Mozart scholars refer to as K. 522 and Mozart lovers call *The Musical Joke*.

The complete piano sonatas of Beethoven were done up definitively by Artur Schnabel, and RCA-Victor added a complete

piano score to the luxurious set it released in the fall of 1955. Other excellent records on the same label were the Tchaikovsky *Piano Concerto No. 1*, played by the visiting Russian Emil Gilels accompanied by the Chicago symphony under Reiner, and the Prokofiev *Sonata No. 1 in F*, played matchlessly by Gilels' fellow countryman David Oistrakh. On Vanguard, the piano curios of the first notable U.S. pianist-composer, Louis Moreau Gottschalk (1829-69), were played by the young American Eugene List in a collection titled *The Banjo. The Creation*, Haydn's ennobling oratorio, was done by the chorus, soloists and orchestra of the Vienna State Opera under Mogens Woldike. On Decca the same work was done as well by the Berlin Philharmonic and choir of St. Hedwig's cathedral under Igor Markevitch.

A new work of an altogether different order was Carl Orff's sensuous *Trionfo di Afrodite*, for which the performing forces were the Bavarian Radio orchestra and chorus under Eugen Jochum. On the Bartok label, Bela Bartok's *Cantata Profana* was played and sung by the New Symphony orchestra and chorus under Walter Susskind. Roger Sessions' *Black Maskers Suite* was played by the Eastman-Rochester Symphony orchestra under Howard Hanson, and Charles Ives's four sonatas for violin were carefully—and bravely—encountered by Rafael Druian on Mercury. To follow its Minneapolis Symphony orchestra readings of the full-length ballet scores of *The Nutcracker* and *Swan Lake*, the same label followed with the same performers in a full-length, or four-record, *Sleeping Beauty* which Antal Dorati conducted with his accustomed care. Westminster provided excellent recordings of Buxtehude organ works played by Alf Linder, the Corelli *Concerti Grossi* of Opus 6 played by a string trio, and the Brahms symphonies sounded out majestically by the Philharmonic Promenade orchestra of London conducted by Sir Adrian Boult. On Angel the Khatchaturian violin concerto was played by Oistrakh with the composer conducting the Philharmonia orchestra, and the Richard Strauss showpiece for voices, instruments and actors of high and low degree was played by the same Philharmonia and sung by an assortment of soloists under the restrained supervision of Herbert von Karajan. The year's project for Walter Giesecking, who in 1955 recorded all the piano works of Mozart, was all the piano works of Ravel. The quality remained high. On Columbia, the astonishing young pianist Glenn Gould played the Bach *Goldberg Variations* with a combination of intelligence and taste. The omnipresent Oistrakh played the Shostakovich *Concerto for Violin and Orchestra* with the New York Philharmonic symphony under Dimitri Mitropoulos. The score of *The Fairy's Kiss*, one of ballet's loveliest creations, was conducted by its composer, Igor Stravinsky, and played by the Cleveland orchestra.

Some good records had no music on them. For Caedmon T. S. Eliot read *The Love Song of J. Alfred Prufrock* and *Ash Wednesday*. For Angel, Sean O'Casey read an introduction to his *Juno and the Paycock* before an accomplished crew of Abbey theatre actors read through the play. For RCA-Victor, the Irish actress Siobhan McKenna and a Broadway cast recorded Bernard Shaw's *Saint Joan*, and for Westminster Miss McKenna read a delightful assortment of Irish ballads and poems. A musical-comedy version of Shaw's *Pygmalion* called *My Fair Lady* was the hit of the Broadway season. The songs of the show were superbly recorded by the cast on Columbia.

With Shaw in song form a hit, there were reasons to assume that Tin Pan alley had lifted itself to new levels of literacy. But to conclude that would be to overlook such records as "Hound Dog" and "Heartbreak Hotel." Elvis Presley sang them, nobody wanted to understand what they were about, and the few who came into the knowledge regretted it. They sold more records, millions more, than Shaw and Mozart combined. (J. J. RY.)

Jazz.—The jazz picture in 1956 looked brighter than at any

me since the beginning of World War II. Jazz centred around clubs, and recordings flourished on both the east and west coasts. The deaths of Clifford Brown and especially Charlie Parker created a deep void in the new progressive movement in jazz which Miles Davis seemed to be filling as well as anyone. While Davis' contributions were identifiable as coming directly from the Gillespie-Parker influence in developing more fully the art of improvisation, they offered freshness and uniqueness. Al Cohn, Stan Getz and Lester Young led in the development of tenor saxophone stylings, while the best known of the alto saxophonists were Lee Konitz and Paul Desmond, with altoist Phil Woods one of the most promising newcomers.

The trombone duo of Jay Jay Johnson and Kai Winding had tremendous box-office success, while Bill Harris, Bob Brookmeyer, Carl Fontana and Urbie Green stood for their less commercial jazz work.

Challenging compositions and arrangements came from the hands of experimenters who worked hard at shaping new concepts and sounds. Charlie Mingus, Lennie Tristano, Jimmy Giuffrè, Art Tatum, Art Farmer, Jack Montrose, Gerry Mulligan, John Lewis and Stan Getz were making great inroads on musical thinking while it was believed the Modern Jazz quartet might well prove to be the most important influence of the decade.

The recent trend had been toward a more "intellectual" jazz influenced by many of the techniques of the European school. Contrapuntal effects and the use of lengthier and newer forms were among the devices being tried. The higher literacy of modern musicians and experiments by musicians who enjoyed the advantage of classical training were providing jazz with classical overtones. Although the value of these contributions awaited further review, their influence should not be underestimated.

(M. E. HL.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*The Brass Choir*, 2nd ed. (1956); *Producing Good Music* (1956); *Listening to Good Music* (the string quartet) (1955); *The Percussion Group*, 2nd ed. (1956); *Playing Good Music* (the string quartet) (1955); *The String Choir*, 2nd ed. (1956); *Symphony Orchestra*, 2nd ed. (1956); *The Woodwind Choir*, 2nd ed. (1956).

Mutton: see MEAT.

Mutual Security Program: see FOREIGN AID PROGRAMS,

Narcotics. The 11th session of the United Nations Commission on Narcotic Drugs held at Geneva, Switz., April 23 through May 18, 1956, included considerable discussion of the second draft of the Single Convention on Narcotic Drugs, which was intended to codify and replace the nine existing international narcotic treaties.

The Economic and Social Council urged governments to send their comments on the revised draft of the single convention to the secretary-general before Jan. 1, 1957, so that a study of these comments might be made and an analysis of them presented at the 12th session of the Commission on Narcotic Drugs. All countries that had not already ratified the International Opium Protocol of 1953 were invited to do so immediately so that this protocol would enter into force as soon as possible.

Technical Assistance.—Governments of opium-producing countries were invited to explore the possibilities of obtaining technical assistance, especially in their efforts to substitute other crops for opium poppy production. Under existing arrangements the United Nations specialized agencies, particularly the World Health Organization and the Food and Agriculture Organization, countries in need of such assistance could apply for it in developing appropriate administrative, social and economic measures to cope with their problems. This assistance was available in the form of advice, fellowships, scholarships and seminars. The Economic and Social Council unanimously agreed that spe-

cial consideration be given to the request of Iran for technical assistance to enable that country to enforce the recent Iranian law banning cultivation of the opium poppy, in addition to the need of Iran for technical assistance for other purposes.

The Economic and Social Council invited the commission to give further consideration to the request of Afghanistan to be included among the countries which may produce opium for export.

Illicit Traffic.—As in previous years, the far east had the heaviest illicit traffic. Hong Kong appeared to be the crossroads for much of the traffic. The situation in the near and middle east was almost equally serious. India had been exercising strict control over legal trade in opium at all stages to prevent diversion into illicit channels. Turkey reported taking all possible steps to prevent leakage of opium into illicit traffic.

The Commission on Narcotic Drugs was deeply concerned about the illicit traffic in Thailand, and requested the secretary-general to invite the governments of Thailand, Burma and Cambodia to send informed representatives to attend the discussions on illicit traffic at the 12th session.

Opium and opium derivatives, particularly morphine and heroin, were by far the most important drugs seized in the internal as well as international illicit traffic.

Raw Opium.—Traffic in raw opium showed no decline. Incomplete reports for 1955 indicated 49,100 kg. had been seized, 35,524 kg. in Thailand. That country had prohibited production of opium since 1949, but the large seizures of opium and crude morphine in 1955 revealed an extremely serious situation there.

Prepared Opium.—World seizures of prepared opium totalled 1,551 kg., most of which were made in the far, near and middle east. This indicated continuance of the deep-rooted habit of opium smoking, despite the legal prohibition of this practice in most of those countries. Thailand was attempting to suppress opium smoking by 1957. Cambodia prohibited all opium smoking on Jan. 1, 1955. Considerable traffic in morphine hydrochloride originated in the forests beyond the northern frontier of Thailand, smuggled by highway and railroad, and mostly destined for illicit export to Singapore and Hong Kong. The appalling illicit traffic in these areas, as well as in the Federation of Malaya, created extremely difficult control problems.

Heroin.—Most governments had taken measures for the prohibition of heroin. Egypt had prohibited the manufacture and import of this drug and had stopped its use for medical purposes. In March 1956 Italy prohibited the manufacture, import and export of heroin, and exercised strict control over its distribution.

Large quantities of morphine and heroin were seized in Hong Kong, Thailand, Lebanon and Turkey, with indications of a similar situation in other countries. In 1955 Lebanon authorities seized about 3½ kg. of heroin. World seizures for the year were 143 kg., of which about 85 kg. were in North America, and more than 41 kg. in the far east.

Cocaine.—The long-term decline in quantities of cocaine seized throughout the world continued, although illicit traffic persisted in the far, near and middle east, Europe and North America. More than 10 kg. were seized, nearly 7 kg. of which were seized in North America. Vigorous enforcement activities broke up one of the principal cocaine smuggling gangs from Bolivia. The Commission on Narcotic Drugs discussed the progress in control of coca leaf production and chewing of coca leaf in Peru, where the recently created Coca Monopoly had the exclusive right to manufacture cocaine.

Cannabis.—Illicit traffic in cannabis continued in most parts of the world, but was a serious problem in only a few areas, where it was largely a domestic rather than an international problem. Lebanon continued to have heavy illicit traffic in this

drug, and during 1955 Lebanese authorities seized more than 1,227 kg. of hashish. More than 1,000,000 kg. of cannabis were seized throughout the world, the greatest quantities in South Africa.

Synthetic Drugs.—Fourteen countries reported the manufacture of synthetic narcotic drugs. Five new synthetic drugs were placed under international control by provisions of the 1948 protocol.

United States.—The president's interdepartmental committee on narcotics, the senate subcommittee on improvements in the federal criminal code, and the house subcommittee on narcotics concluded studies of the narcotics problem and issued reports of their findings. The recommendations of these three committees were largely responsible for the prompt enactment by the 84th congress of the Narcotic Control act of 1956. Salient features of this act include:

Broader authority for officers and agents of the bureau of narcotics and customs bureau to make searches, seizures and arrests in investigating and prosecuting violators of the federal narcotic laws;

A minimum sentence of 10 years and a maximum sentence of death for unlawful sale of heroin by a person over 18 years of age to any person under 18;

Denial of probation, suspension of sentence and parole for any narcotic violation except a first offense for possession-type offenses;

Minimum mandatory sentence of 5 years for first offenses of sale of narcotic drugs or marihuana, and 10 to 40 years for subsequent offenses, plus fines up to \$20,000;

Authority for the bureau of narcotics to conduct training programs for state and local narcotic enforcement officers.

The narcotic control law enacted by the Ohio state legislature in 1955, providing imprisonment of 20 to 40 years for unlawful sale of narcotic drugs, the most severe of all state narcotic control laws, virtually stopped the illicit narcotic traffic in that state during the first year of its operation. (H. J. A.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Drug Addiction* (1952).

Nasser, Gamal Abdel (1918–), Egyptian president was born at Beni Mor, Asyut province, upper Egypt, Jan. 15. He studied at El-Nahda-el-Misria secondary school in Cairo and at the military college. On graduating he was sent to a rifle battalion at Mankabad (Asyut). He was posted in 1939 to Alexandria, and in Nov. 1942 he was appointed lecturer at the military college and soon afterward founded the secret Free Officers' movement. He fought well in the Palestine war of 1948–49, but the Israeli victory gave further impetus to his ideas and plans. He was determined to get rid of the Farouk regime, which had failed to supply adequate munitions to the army.

In May 1952, then a lieutenant colonel, Nasser approached Maj. Gen. Mohammed Naguib and offered him the post of leader of the planned revolution. The coup d'état of July 23 succeeded, and Naguib became the head of state and later president of the republic and premier. The real power, however, was held by the Revolutionary Command council (R.C.C.) composed of 11 officers and controlled by Nasser, although Naguib was its nominal chairman. The relations between Naguib and Nasser became embittered because the former thought the revolution was going too far and wanted a return to a parliamentary regime. Nasser opposed such a move, which would mean a return of the old regime. Naguib's popularity was great, however, and it was only after several shuffles of office that Nasser emerged secure as premier on April 18, 1954, and Naguib in November of that year was removed entirely from office. In the spring of 1954 Nasser published a 73-page book entitled *The Philosophy of the Revolution* in which he suggested that Egypt was the natural leader of the Arab world.

July 27, 1954, was for Nasser a day of great triumph: together with Antony Head, the British secretary of state for war, he initialled an agreement stipulating the evacuation of the Suez Canal Zone by the British forces within 20 months. On Oct. 19,

he signed the final text of the Anglo-Egyptian treaty.

On June 22, 1956, a national plebiscite approved Nasser as Egypt's president for six years. On July 18–19, on the island of Brioni, Yugoslavia, Marshal Tito, Jawaharlal Nehru, the Indian premier, and Nasser met together. A common communiqué published on July 20 aired neutralist views on the current world issues. On July 26 Nasser nationalized the Suez Canal company. Between Sept. 3 and 9 he conferred five times with R. G. Menzies, chairman of a committee of five appointed by 18 of the 22 nations attending the London conference on Suez. On Oct. 30 he rejected the Anglo-French ultimatum and declared that Egypt would resist all aggressors. On Nov. 16 he had talks with Dag Hammarskjöld, secretary-general of the United Nations, about the entry of the UN police forces into the Suez canal area.

National Academy of Sciences: see SOCIETIES AND ASSOCIATIONS, U.S.

National Association for the Advancement of Colored People: see SOCIETIES AND ASSOCIATIONS, U.S.

National Association of Manufacturers: see SOCIETIES AND ASSOCIATIONS, U.S.

National Association of Real Estate Boards: see SOCIETIES AND ASSOCIATIONS, U.S.

National Association of State Libraries: see SOCIETIES AND ASSOCIATIONS, U.S.

National Budget: see BUDGET, NATIONAL.

National Catholic Community Service: see SOCIETIES AND ASSOCIATIONS, U.S.

National Catholic Welfare Conference: see SOCIETIES AND ASSOCIATIONS, U.S.

National Congress of Parents and Teachers: see SOCIETIES AND ASSOCIATIONS, U.S.

National Council of the Churches of Christ in the U.S.A.: see SOCIETIES AND ASSOCIATIONS, U.S.

National Debt: see DEBT, NATIONAL.

National Education Association: see SOCIETIES AND ASSOCIATIONS, U.S.

National Foundation for Infantile Paralysis: see POLIO-MYELITIS; SOCIETIES AND ASSOCIATIONS, U.S.

National Gallery of Art: see SMITHSONIAN INSTITUTION.

National Geographic Society. In 1956, the fifth season of the National Geographic society "Calypso" oceanographic expeditions directed by French navy Capt. Jacques Yves Cousteau, these projects were carried on: In April, 20-ft. sediment cores were taken from the Mediterranean floor off the Balearics for study of the sea's ancient past. In May and June biologists of the Paris Museum of Natural History aboard the "Calypso" were successful in collecting new species of marine life around São Tomé and neighbouring equatorial islands off Africa's west coast.

During the following weeks Captain Cousteau and Harold E. Edgerton, of the Massachusetts Institute of Technology, directed the successful lowering of the new Edgerton electronic-flash ultimate-depth camera by braided nylon cable of $\frac{1}{4}$ -in. diameter to the 25,000-ft. floor of the Romanche trench, one of the deepest points in the Atlantic. They also used nylon cable, which is virtually weightless in water, to anchor the "Calypso" in this record depth for such operations, and to anchor a radar buoy which enabled them to chart the topography of the trench accurately over a range of several square miles.

In early September the "Calypso" served off Monaco in original deep-level experiments with radiocarbon to determine whether carbon can be assimilated by means other than photosynthesis. The research ship's season concluded with six weeks'

work in hydrology and biology in the eastern Mediterranean.

At Bloemfontein, U. of S.Af., from June to December, E. C. Liphert directed further photography of Mars with the 27-in. refracting telescope of the Lamont-Hussey observatory during the planet's closest approach to earth in 30 years. This National Geographic society-Lowell observatory expedition added about 20,000 photographs to the 20,000 taken at the same site in 1954, showing the planet's faint atmospheric envelope and its markings indicating the existence of simple plant life. The project was part of the International Mars committee program carried on at 22 observatories around the world. Within the same program the society supported a spectroscopic study of the red planet's atmosphere from an observation post high on Mauna Loa volcano, Hawaii, by C. C. Kiess and C. H. Corliss of the national bureau of standards.

Their research indicated no detectable water vapour or oxygen enveloping Mars.

In September at Goteborg, Swed., the society launched a world-wide cosmic-ray mapping program jointly sponsored with the Bartol Research foundation of the Franklin institute, Philadelphia, Pa., with Canadian, Swedish and other U.S. groups co-operating. A three-ton cosmic-ray monitor built by the Bartol laboratory was to travel on different ships and routes throughout the International Geophysical year, 1957-58, recording fluctuations in cosmic rays across ocean reaches never before covered. Scientists would relate data of the cosmic-ray map thus obtained to outbursts of energy on the sun, to the deflecting effect of the earth's magnetic field at varying latitudes and to possible sources of the rays; and might be enabled to pinpoint more exactly the so-called geomagnetic equator, poles and co-ordinates.

Reporting in the November issue of the *National Geographic Magazine* on his 1954 and 1955 field studies of Indian sites on northern islands of Hudson bay, Smithsonian institution archaeologist Henry B. Collins radiocarbon-dated the lost civilization of Dorset Eskimos as contemporary with Christ. He described similarities of its tools to those of European Mesolithic men who vanished 8,000 years ago as well as to those of the Sadlermiuts of the Hudson bay region who survived to early 20th-century years.

Boston cardiologist Paul Dudley White early in the year led an expedition to the Mexican Pacific coast calving habitat of the gray whale to obtain electrocardiograms of this 30-ton species, aided by a National Geographic research grant. He planned to renew with improved equipment this quest for clues to the mysteries of the human heart.

The National Geographic society-University of Miami pelagic fish life history program, begun in 1950, continued successful research in identifying previously unrecognized larval and infant forms of important food and game fishes.

Staff writer Andrew H. Brown and photographer John E. Belcher accompanied Adm. Richard E. Byrd to Antarctica early in the year, and contributed illustrations to Admiral Byrd's account of the first phase of Operation "Deepfreeze" in the *National Geographic Magazine* for Aug. 1956.

The last of 1,758 photographs to complete the sky atlas of the National Geographic society-Palomar observatory sky survey was taken with the Schmidt 48-in. wide-angle telescopic camera on May 11, 1956. The work of assembling and forwarding sections of this unprecedented "portrait of the universe" to observatories and scientific institutions continued throughout the year. The survey was started in 1949.

In August a second large edition of the society's 432-page book, *Adrians of the Americas*, first published in late 1955, came from the presses.

The society's members at the year's end numbered 2,150,000. thousand colour pictures filled 840 colour pages in the year's 2 issues of the *National Geographic Magazine*. "Round About

the Nation's Capital," Alaska, the United States and "Lands of the Bible Today" were 1956 subjects of large-scale map supplements in colour prepared by the cartographic division. Forty-five staff-drawn maps and diagrams illustrated articles on regional geography.

The society's news service staff continued to send an average of six bulletins weekly through 1956 to daily newspapers, press associations and other news outlets covering geography behind headline news and progress of expeditions and researches. Geographic school bulletins for classroom use were sent weekly during the school year to 35,000 teachers and students.

Officers of the society during 1956 were: chairman of the board of trustees, Gilbert Grosvenor; president and editor, John Oliver La Gorce; vice-president and associate editor, Melville Bell Grosvenor; vice-president and secretary, Thomas W. McKnew; treasurer, Robert V. Fleming; research committee chairman, Lyman J. Briggs; vice-chairman, Alexander Wetmore.

(J. O. L. G.)

National Guard. By the end of Aug. 1956 the U.S. army national guard consisted of 5,369 units and 403,371 officers and enlisted men, and the air national guard consisted of 609 units and 63,403 officers and airmen. These units and personnel were located in more than 2,500 cities and towns throughout the United States, including each of the 48 states, the territories of Hawaii and Alaska, the Commonwealth of Puerto Rico and the District of Columbia.

On Feb. 1, 1956, the last national guard unit remaining on active duty with the army, one of the 2,161 national guard units which were ordered to active duty during the Korean emergency, was released from federal service and returned to state control.

During 1955-56 the national guard continued to fulfil both its basic mission of providing a reserve force capable of immediate mobilization in the event of a national emergency and its added mission of participating in the active defense of the continental United States. The air national guard successfully completed its first year of participation in the air defense augmentation plan of the air defense command. Seventeen air national guard squadrons, operating from strategic bases on a five-minute runway alert status, flew more than 19,000 hours under air defense command control while carrying out nearly 27,000 intercepts and scrambles.

The army national guard, in joint participation with the regular army in the anti-aircraft defense of the continental United States, expanded its anti-aircraft artillery program so that, by the end of Sept. 1956, 85 army national guard anti-aircraft artillery batteries had assumed the 24-hour on-site defense of 11 major industrial and population areas, replacing a like number of active army batteries.

During 1955-56 the 48th infantry division, Georgia-Florida national guard, was converted to an armoured division, three regimental combat teams were converted to an armoured cavalry regiment, a field artillery group and an armour group; and one armour group was reorganized as an armoured cavalry regiment. Eight of the air national guard's 27 tactical flying wings were reorganized from fighter-interceptor (day fighter) to air defense (all weather), with eight more wings to be similarly reorganized at a future date. By Sept. 1, 1956, the air national guard had converted 71 of its 81 fighter-interceptor and tactical reconnaissance squadrons from conventional to jet aircraft, with the remaining 10 squadrons scheduled for conversion prior to July 1, 1957.

During 1955-56, as in past years, the national guard participated in hundreds of rescue and relief missions, fought fires and floods, flew missions of mercy and responded in all types of local and state emergencies.

(E. C. EN.)

National Income and National Product: *see* INCOME AND PRODUCT, U.S.

National Insurance: *see* SOCIAL SECURITY.

National Labor Relations Board. During the ninth year of administration of title I of the Labor Management Relations act, the National Labor Relations board interpreted some phases of the statute for the first time and made a number of changes in policy.

During the 1956 fiscal year, Pres. Dwight D. Eisenhower designated Boyd Leedom as chairman and appointed a new member, Stephen S. Bean of Massachusetts, to the five-member board. At the close of fiscal 1956 the board was composed of Chairman Boyd Leedom and members Abe Murdock, Ivar H. Peterson, Philip Ray Rodgers and Stephen S. Bean. Theophil C. Kammholz was the general counsel.

Unfair Labour Practice Cases.—The board had occasion for the first time to interpret section 502 which provides: "... nor shall the quitting of labor by an employee or employees in good faith because of abnormally dangerous conditions for work at the place of employment of such employee or employees be deemed a strike under this act." A group of buffers, who were subject to a no-strike agreement, walked out when the plant's ventilating and cooling system broke down. They were thereupon discharged for striking in violation of the no-strike agreement. As the failure of the blower system created "abnormally dangerous" working conditions, the board held that the walkout was not a "strike," but constituted protected activity for which the buffers could not be lawfully discharged.

The board also adopted a new standard for payment of back pay to employees who had been illegally discharged. Formerly it was sufficient for such employees to show only registration with the United States employment service to prove a "reasonable" effort to obtain work during the period of discrimination. During fiscal 1956 the board changed this rule so that registration was considered only one of the elements in the determination of the "reasonableness" of the employee's effort to obtain employment; the ultimate judgment in each instance was to be made on a case by case basis.

Representation Cases.—The board eliminated the "neither" or "no union" choice on the ballot in the so-called "severance" elections; in these elections employees voted whether or not they wished to sever themselves from a larger bargaining unit. The board noted: "Nothing in the act nor its legislative history ... expressly or impliedly requires that employees in a ... severance election be afforded an opportunity to return to non-union status."

The board also revised its policy concerning a union's failure to file annually the financial statements required by section 9 (g) of the act. In setting aside the certifications of exclusive bargaining status of unions who had failed to make such timely filings, the board announced this policy: (1) upon expiration of a union's fiscal year, 90 days may be granted to comply with sec. 9 (g), provided the union has filed a certificate of intent to renew its compliance or a letter to that effect; (2) additional time will be granted only where circumstances beyond the union's control prevent timely compliance; and (3) failure to comply will result in dismissal of a petition or immediate denial of the use of board processes, and revocation of any board action taken on behalf of the noncomplying union during the 90-day grace period.

The board also laid down new guide lines to determine whether certified bargaining rights succeeded to a union which was the product of a merger of two labour organizations. The board pointed to the following elements in reaching its conclusion that

a merged union acquired the bargaining rights of the unions which joined together to form it: (1) the merger was achieved in a democratic manner inasmuch as there was knowledge, participation and approval on the part of rank-and-file members; (2) the two unions were comparable in size and had equal representation on matters relating to consolidation; (3) the merger procedures followed the requirements of the constitutions of both unions; and (4) the employees involved and hundreds of employers considered the consolidated union as the continuance of the constituent unions.

Case Activity.—During the fiscal year ended June 30, 1956, the five-member board issued decisions in 1,609 proceedings, compared with 1,977 in the preceding year. Of the 1,609 proceedings, 202 involved unfair labour practices and 1,407 questions of representation.

The general counsel issued unfair labour practice complaints in 442 proceedings during fiscal 1956, compared with 375 in the previous year. His staff closed 5,030 unfair labour practice cases without the necessity of formal action, compared with 5,329 in fiscal 1955.

Unfair labour practice cases and representation cases filed during fiscal 1956 totalled 13,388. Petitions for representation elections numbered 8,123, and charges of unfair practices against either employers or unions, or both, totalled 5,265 cases.

The board conducted a total of 5,075 representation elections during the 1956 fiscal year. Union representation was chosen by a majority of employees in 3,270 elections, or 64% of those held. Valid ballots were cast by 90% of the 473,992 who were eligible to vote. Bargaining agents were chosen to represent units totalling 296,974 employees, or 63% of those eligible to vote.

Unions affiliated with the American Federation of Labor and the Congress of Industrial Organizations won 2,941 out of 4,818 representation elections in which they participated. Unaffiliated unions won 329 out of 551 elections.

Of the unfair practice cases filed during the 1956 fiscal year, 1,743 involved charges against unions. This was 33% of the unfair labour practice cases filed. Charges of unfair practices were made against employers in the remaining 3,522 cases, or 67%.

Back pay totalling \$1,388,314 was awarded to 2,160 employees found to have suffered discrimination by employers or unions, or both. A total of 1,566 employees were reinstated in jobs after being illegally discharged because of their union activities or because they refrained from such activities.

Petitions for injunctions to halt alleged unfair labour practices were filed by the general counsel in 79 instances during fiscal 1956. The courts granted relief in 21 instances; denied applications in 5; 43 were settled, withdrawn or dismissed; and 10 still pending at the end of fiscal 1956. (*See also* LABOUR UNIONS; STRIKES.)

(B. LM.)

National Museum: *see* SMITHSONIAN INSTITUTION.

National Parks and Monuments. One of the highlights of 1956 was the initiation of Mission "66," a comprehensive conservation, development and staffing program to enable the United States national park system to serve an estimated 80,000,000 visitors yearly by 1966. In that year, the national park service would celebrate the 50th anniversary of its establishment as a bureau of the department of the interior.

The appropriation by congress of about \$68,000,000 (39% more than was provided in the previous year) enabled the service to make an auspicious start on this program. By Sept. 1, 1956, work had been initiated on road, trail, campground, building, utility and various other projects in 79 of the 180 areas admin-

Areas Administered by the National Park Service (Sept. 1, 1956)

Type of area	Number	Federal land (approximate acreage)
National parks*	28	13,080,332.12
National historical parks	8	31,928.56
National monuments	83	8,983,881.93
National military parks	11	24,541.58
National memorial parks	1	68,466.53
National battlefield parks	3	5,516.25
National battlefield sites	5	188.63
National historic sites	10	1,354.07
National memorials	12	4,426.18
National cemeteries	10	215.10
National seashore recreational areas	1	24,705.23
National parkways	3	84,330.42
National capital parks	1	38,615.93
National recreation areas	4	2,020,063.80
Total	180	24,368,566.33

*Largest and oldest national park is the Yellowstone in Wyoming (also includes small portions of Idaho and Montana). Established in 1872, the park contains more than 2,000,000 ac.

ered by the service. Work was also under way on a number privately financed facilities, including a multimillion dollar development at the new Canyon village in Yellowstone National park, Wyo., a marine service building at Flamingo bay in Everglades National park, Fla., and large-scale cabin developments at Abasco bay in Grand Teton National park, Wyo., and on the south shore of the Grand Canyon, Ariz.

Legislation enacted by congress assured preservation of portions of beautiful St. John Island, one of the U.S. Virgin Islands in the Caribbean, as the 29th national park. Before the park could be established 5,000 ac., out of an authorized total of approximately 9,500 ac., had to be federally owned. Slightly more than 5,000 ac. had already been acquired by Laurance S. Rockefeller for the purpose.

Two nationally significant historic areas were given national monument status—Old Fort Union, N.M., onetime outpost on the old Santa Fe trail, and the laboratory at West Orange, N.J., where Thomas Alva Edison achieved his notable discoveries. Edison's home, "Glenmont," located a short distance from the laboratory, was designated as a national historic site in nonfederal ownership, as was also Chimney Rock, Neb., a notable landmark on the old Oregon trail.

Congress granted authority for the establishment of three new historical areas as units of the national park system—Pea Ridge National Military park, Ark.; Horseshoe Bend National Military park, Ala.; and Booker T. Washington National monument, Va. Their establishment hinged on acquisition of the needed lands by the federal government.

Addition of Mikveh Israel cemetery to Independence National historical park, Philadelphia, Pa., was authorized on completion of a satisfactory agreement between the Mikveh Israel congregation and the national park service.

Castle Pinckney National monument, S.C., and Verendrye National monument, N.D., were abolished, and authority was granted by congress to abolish Fossil Cycad National monument, D., on Sept. 1, 1957. These actions were in line with the department of the interior's policy of eliminating from the national park system areas of less than national significance.

In the interest of more effective and economical operation, Zion National monument, Utah, was abolished. The land formerly in the monument was added to Zion National park.

Public use of the various units of the national park system increased. In the first seven months of 1956 there were approximately 31,600,000 visitors, or about 3,000,000 more than were recorded in the corresponding months of 1955. An all time single-month record was established in July 1956 when 10,280,877 visitors were tallied. The visitor count for the 1955 calendar year was 50,007,838, an increase of about 2,000,000 over the 1954 total and approximately 28,000,000 more than were recorded in 1953.

The need for prompt action by federal, state and local authorities in setting aside seashore areas for public use and enjoyment

was stressed in "Our Vanishing Shoreline," a report presenting the findings of an extensive survey of the Atlantic and Gulf coast regions made by the service with the assistance of the U.S. coast guard, fish and wildlife service, and various other federal, state and private organizations. The survey disclosed that only a small amount of seacoast was left undeveloped for potential public use and that much of this small portion was rapidly disappearing.

For outstanding service to the national park service in the field of conservation, the department of the interior Conservation Service award was presented to Walt Disney, Burbank, Calif.; Laurance S. Rockefeller, New York city; David E. Finley, Washington, D.C.; Harland Bartholomew, St. Louis, Mo.; and Frederick Law Olmsted, Palo Alto, Calif.

Other significant developments of the year 1956 were the redesignation of Bedloe's Island, New York harbour, site of the Statue of Liberty, as Liberty Island; and the discovery, during the course of archaeological operations at Yorktown battlefield, Colonial National Historical park, Va., of the remains of British redoubt number 10 where, on Oct. 19, 1781, George Washington signed the articles of Lord Cornwallis' surrender.

(C. L. W.)

England and Wales.—No further national parks were designated during 1956. The minister of housing and local government confirmed the order setting up the Northumberland National park (398 sq.mi.), and confirmation of the order for the Brecon Beacons National park was awaited. The nine national parks already established covered an area of 4,731 sq.mi. During the year the national parks commission gave increased attention to "areas of outstanding natural beauty," and designated the following areas: Gower peninsula (73 sq.mi.); Quantock hills (38 sq.mi.); Llyn (60 sq.mi.); and Surrey hills (160 sq.mi.). Each of these awaited confirmation by the minister.

Australia.—*Queensland.*—There were 249 national parks in 1956, covering an area of 788,119 ac. Increased attention was given to the provision of better access facilities for visitors to the parks, who numbered 500,000 during the year.

South Australia.—An area of approximately 2,000 ac. situated about 8 mi. E. of Mt. Barker and comprising the reserves known as McDonald reserve and Ferris reserve, was placed under the control of the national park commissioners. An area of 22 ac. of virgin bushland, situated at Mypolonga, about 40 mi. E.S.E. of Adelaide, was taken over and named the Nixon-Skinner reserve. About 400,000 people visited the Belair National park during the year.

Tasmania.—An area of 430 ac. of bushland and gorge, bordering on the Roger river, was established as a national park. Consideration was given to reserving an area of approximately 50,000 ac., embracing the Arthur range in the southwest, as a national park.

Victoria.—The only development during the year was the addition of 370 ac. to the Fern Tree gully national park. This park had a total area of 926 ac. The Buchans caves national park was visited by 37,852 persons.

Western Australia.—Provision was made for the establishment of a new national park of 9,043 ac. on the southern coast near Albany. Attention was also being given to the establishment of another park south of Pinjarra, a town situated about 50 mi. from Perth.

Canada.—During the year a record number of 3,639,151 persons visited the national parks and national historic parks. Considerable progress was made in the construction of the Trans-Canada highway through Banff and Yoho national parks.

India.—In 1956 the Haily National park was the only national park in India. Situated at the foot of the Himalayas in the state of Uttar Pradesh, it extended over an area of approximately

125 sq.mi. The establishment of national parks in the states of Saurashtra, Orissa, Madras, Bihar, Madhya Pradesh and Assam was under consideration.

New Zealand.—The Abel Tasman National park was extended by the inclusion of 137 ac. An addition of 29,580 ac. was made to the Fiordland National park.

South Africa.—Considerable development took place in the Kruger National park. A new water scheme for the Pretoriusskop rest camp was completed, and 5,000 ac. were set aside for scientific research on veld management. A record number of 101,058 persons visited the park during the year.

Tanganyika.—The Serengeti National park remained the only national park in Tanganyika, although investigation of other potential parks continued throughout the year. Nearly 3,000 people visited the park.

(See also TOURIST TRAVEL.)

(H. M. As.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Glacier National Park* (1955); *Free Horizons* (1955); *Grand Canyon* (1955); *Mt. Rainier* (1955); *Yosemite* (1955).

National Recreation Association: see SOCIETIES AND ASSOCIATIONS, U.S.

National Safety Council: see ACCIDENTS.

National Science Foundation: see SOCIETIES AND ASSOCIATIONS, U.S.

National Society for Crippled Children and Adults, Inc.: see SOCIETIES AND ASSOCIATIONS, U.S.

National Temperance League, Inc.: see SOCIETIES AND ASSOCIATIONS, U.S.

National Wealth: see WEALTH AND INCOME, DISTRIBUTION OF.

Natural Gas: see GAS, NATURAL AND MANUFACTURED.

Naturalization: see IMMIGRATION, EMIGRATION AND NATURALIZATION.

Nauru: see TRUST TERRITORIES.

Navies of the World. At the end of 1956 there were three great navies, those of the United States, the U.S.S.R. and the United Kingdom. Other major fleets were those of France and Italy, followed by those of the Netherlands, Sweden, Spain, Turkey, Canada, Australia, Argentina, Brazil and Chile. There were also 45 lesser navies. The comparative strengths in ships, of and above the escort categories, of the navies of the world were as shown in Table I.

Among the naval events of the year were: the collision between the U.S. heavy cruiser "Columbus" and the U.S. destroyer "Floyd B. Parks" off Luzon, Phil., on March 11; the maritime Exercise "Dawn Breeze" of the North Atlantic Treaty organization during March 20–25; the largest commonwealth maritime exercise ever held in far eastern waters, known as "Monsoon," concluded early in April; the completion and commissioning on April 14 of the U.S. giant aircraft carrier "Saratoga," the largest aircraft carrier in the world; the Allied naval and air Exercise "Medflex Dragon," covering the whole of the Mediterranean area, during April 11–20; the visit to Portsmouth on April 18 of the Soviet naval squadron, comprising the cruiser "Ordzhonikidze" and the destroyers "Sovershenny" and "Smotryashchi," which brought the Soviet statesmen N. A. Bulganin and N. S. Khrushchev to the United Kingdom; the six-day NATO combined anti-submarine exercise designated "New Broom V" which began in the Atlantic on May 1; the collision between the U.S. battleship "Wisconsin" and the U.S. escort destroyer "Eaton" in the Atlantic on May 6; the provisional acceptance into service on May 8 of the British experimental high-speed submarine "Explorer," the first with turbine machinery using hydrogen peroxide; the laying down of the U.S. giant atomic-powered radar picket submarine, "Triton," which was to be propelled by two

Table I.—Navies of the World, Dec. 1956*

Country	Fleet air- craft carriers	Light fleet air- craft carriers	Escort and ferry carriers	Battle- ships	Cruis- ers and armoured ships	Destroy- ers	Frig- ates and escort ves- sels	Sub- ma- rines
United States	30	7	66	15	76	381	359	204
U.S.S.R.	—	—	—	3	32	150	250	475
Great Britain	5	9	—	5	22	68	168	54
France	—	3	1	2	5	25	57	14
Italy	—	—	—	2	3	7	40	5
Netherlands	—	1	—	—	2	12	24	6
Sweden	—	—	—	—	5	14	9	24
Spain	—	—	—	—	5	18	31	6
Turkey	—	—	—	—	1	10	—	12
Canada	—	1	—	—	2	11	53	—
Australia	—	2	—	—	1	6	17	—
Argentina	—	—	—	2	5	15	9	3
Brazil	—	—	—	—	2	9	8	3
Chile	—	—	—	1	2	6	6	3
India	—	—	—	—	2	6	4	—
New Zealand	—	—	—	—	2	—	6	—
Greece	—	—	—	—	1	2	19	4
China (Communist)	—	—	—	—	1	4	12	13
Pakistan	—	—	—	—	1	8	4	—
Norway	—	—	—	—	—	5	12	8
Portugal	—	—	—	—	—	5	8	3
Japan	—	—	—	—	—	4	29	1
China (Nationalist)	—	—	—	—	—	10	20	—
Peru	—	—	—	—	—	—	6	6
Rumania	—	—	—	—	—	4	—	3
Egypt	—	—	—	—	—	4	7	—
Venezuela	—	—	—	—	—	3	6	—
Poland	—	—	—	—	—	2	—	4
Thailand	—	—	—	—	—	—	5	4
Dominican Republic	—	—	—	—	—	2	9	—
South Africa, Union of	—	—	—	—	—	2	4	—
Israel	—	—	—	—	—	2	3	—
Colombia	—	—	—	—	—	2	4	—
Indonesia	—	—	—	—	—	1	4	—
Denmark	—	—	—	—	—	—	12	3
Yugoslavia	—	—	—	—	—	—	4	2
Mexico	—	—	—	—	—	—	8	—
Korea	—	—	—	—	—	—	6	—

*Other naval forces with four or fewer escort vessels are those of Cuba, Belgium, Ireland, Iran, Uruguay, Ecuador and Burma. Minor warships are possessed by Bulgaria, Ceylon, Finland, Germany (East), Germany (West), Haiti, Honduras, Hungary, Iceland, Iraq, Panamá, Paraguay, Philippines and Vietnam (South).

nuclear reactors; the commissioning of the British guided-weapons trials ship "Girdle Ness" on July 24; the ordering of a new U.S. nuclear-powered guided-missile cruiser, designed to be the first atomic-powered surface warship in the world; the SEATO (Southeast Asia Treaty organization) combined sea-air Exercise "Albatross" which began on Oct. 2 with British, United States, Australian and Thai forces participating; and the completion in October of the U.S. submarine "Sea Wolf," the second to be atomic powered but the first with an intermediate reactor and a liquid metal coolant.

U.S. Naval Strength.—Three giant aircraft carriers of 60,000 tons were being built, the "Independence," "Kitty Hawk" and "Ranger," and a sixth ship of this class, of which the "Forrestal" and "Saratoga" were the forerunners, was projected. Twelve aircraft carriers of the "Midway" and "Essex" classes were being converted with the angled deck and the enclosed bow. The heavy cruiser "Canberra" was converted to a guided-missile ship, and three sister ships, "Helena," "Macon" and "Toledo," were also adapted for guided missiles. Eleven destroyer leaders (frigates), 24 large destroyers, 13 destroyer escorts, 13 more nuclear-powered submarines and 6 large submarines of conventional design were under construction or projected. In addition to the ships enumerated in Table I, there were 310 minesweepers and minelayers, 25 escorts, 116 patrol vessels, 562 amphibious craft, 550 auxiliaries and 1,800 service craft. The U.S. navy comprised a total of 4,500 vessels at the end of 1956.

U.S.S.R.—Six more of the class of large cruisers of which the "Sverdlov" was the prototype were under construction, bringing the number of this type up to 22 units. Among the new Russian destroyers were 32 of the flush-decked fleet-and-escort types, and new frigates numbered 12. A large number of ocean-going long-range submarines were completed.

British Naval Strength.—The modernization of the fleet aircraft carrier "Victorious," being completely rebuilt into a bigger ship, was nearing completion. The intermediate fleet aircraft carrier "Hermes" was still under construction. The light fleet aircraft carriers "Hercules" and "Leviathan" were still sus-

Table II.—Modern Types of Warships

Category	Name or class	Country	Tons displacement	Main Armament guns	Torpedo tubes	Aircraft	Shaft horse power	Knots speed	Date of completion
Fleet Aircraft Carriers	"Saratoga"	U.S.	60,000	8 5-in.	—	100	260,000	35	1956
	"Coral Sea"	U.S.	45,000	14 5-in.	—	137	212,000	33	1947
	"Ark Royal"	U.K.	36,800	16 4.5 in.	—	110	152,000	31½	1955
	"Oriskany"	U.S.	33,100	8 5-in.	—	100	150,000	33	1950
	"Albion"	U.K.	22,000	...	—	45	76,000	29½	1954
Light Fleet Carriers	"Wright"	U.S.	14,500	...	—	50	120,000	33	1947
	"La Fayette"	France	11,000	...	—	45	100,000	32	1943
	"Missouri"	U.S.	45,000	9 16-in.	—	—	212,000	33	1944
Battleships	"Vanguard"	U.K.	44,500	8 15-in.	—	—	130,000	30	1946
	"Jean Bart"	France	38,750	8 15-in.	—	—	150,000	30	1949
	"Alaska"	U.S.	27,500	9 12-in.	—	—	150,000	33	1944
Large Cruisers	"Salem"	U.S.	17,000	9 8-in.	—	—	120,000	33	1949
	"Roanoke"	U.S.	14,500	12 6-in.	—	—	120,000	32	1948
Light Cruisers	"Sverdlov"	U.S.S.R.	15,450	12 6-in.	10 21-in.	—	130,000	34½	1952
	"De Ruyter"	Netherlands	9,735	8 6-in.	—	—	85,000	32	1953
	"De Grasse"	France	8,000	16 5-in.	—	—	105,000	33½	1955
	"Superb"	U.K.	9,000	9 6-in.	6 21-in.	—	72,500	31½	1945
	"Göta Lejon"	Sweden	8,000	7 6-in.	6 21-in.	—	100,000	33	1947
	"Wilkinson"	U.S.	3,700	2 5-in.	4 21-in.	—	80,000	35	1954
	"Diana"	U.K.	2,610	6 4.5-in.	10 21-in.	—	54,000	34¾	1954
	"Forrest Sherman"	U.S.	2,850	3 5-in.	4 21-in.	—	100,000	35	1955
	"Alamein"	U.K.	2,400	5 4.5-in.	10 21-in.	—	50,000	31	1948
	"Skory"	U.S.S.R.	2,200	4 5.1-in.	10 21-in.	—	70,000	38	1953
Frigates	"Halland"	Sweden	2,600	4 4.7-in.	8 21-in.	—	50,000	35	1955
	"Whitby"	U.K.	2,000	2 4.5-in.	12 21-in.	—	30,000	30	1956
	"Mounts Bay"	U.K.	1,580	4 4-in.	—	—	5,500	19½	1949
	"Le Corse"	France	1,290	6 2.25-in.	12 21.7-in.	—	20,000	27	1954
Torpedineers	"Sea Wolf"	U.S.	3,260	...	6 21-in.	—	...	30½	1956
	"Gudgeon"	U.S.	1,615	...	6 21-in.	—	...	20	1950
	"K 1"	U.S.S.R.	1,457	2 4-in.	10 21-in.	—	...	22½	1943
	"Artful"	U.K.	1,120	1 4-in.	8 21-in.	—	...	18	1948
	"Artemis"	France	820	1 3.5-in.	10 21.7-in.	—	...	17	1953

ended. The construction of the long-suspended cruisers "Blake," "Defence" and "Tiger" was resumed. Four fleet escort ships (superdestroyers) and 11 general-purpose frigates were under construction or projected. Twenty-six new frigates of the anti-aircraft, aircraft direction and two anti-submarine types were being built. Six new submarines were under construction. Warships other than those shown in the table included 3 fast minesweepers, 61 ocean minesweepers, 91 coastal minesweepers, 104 inshore minesweepers, 42 fast patrol boats, 28 seaward defense boats, 33 trawlers, 62 landing craft and many miscellaneous ships and auxiliaries.

France.—Two fleet aircraft carriers were under construction. The anti-aircraft cruiser "Colbert" was launched. Five more new destroyers were completed and one was under construction; 6 new frigates were completed and 12 were under construction, and 10 submarines were being built or were projected.

German Federal Republic.—The projected strength of the newly formed west German navy, which would not be attained

until 1960, was 170 ships and 20,000 men.

Italy.—Two large destroyers, four frigates and three corvettes were being built or were completed. A number of minesweepers were acquired from the United States.

Netherlands.—Eight large destroyers were completed or were under construction. Eight submarines were being built or were projected, and 32 coastal minesweepers were completed or were in various stages of construction.

Sweden.—Two large destroyers were ordered, and 4 destroyers, 12 submarines, a large minelayer, 15 motor torpedo boats and 8 coastal minesweepers were being built.

Canada.—The light fleet aircraft carrier "Bonaventure" was being completed in Great Britain, and 12 destroyer escorts, 6 coastal minesweepers and 3 seaward patrol craft were being built. A number of destroyers and frigates were converted for anti-submarine duties.

Australia.—Three "Daring" class destroyers and four fast anti-submarine frigates were being built.

See *Jane's Fighting Ships, 1956-57*, Raymond V. B. Blackman, ed. (London, 1956). (R. V. B. B.)

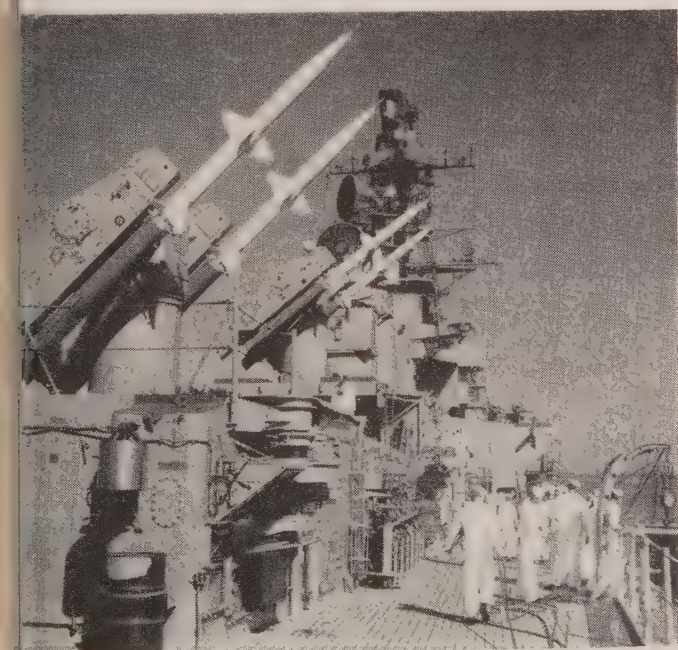
Navy, U.S. Department of: see GOVERNMENT DEPARTMENTS AND BUREAUS, U.S.

Nebraska. Known as the "Cornhusker state," Nebraska is situated in the west north central portion of the U.S. Area: 77,227 sq.mi., including an estimated 564 sq.mi. of water. Population: (1950 census) 1,325,510; (July 1, 1956, provisional est.) 1,414,000. In 1950 the urban population constituted 46.9% of the total.

Capital city: Lincoln, pop. (1950) 98,884; largest city: Omaha, pop. 251,117.

History.—In the Nov. 1956 general election, Nebraska's electoral votes went to Pres. Dwight D. Eisenhower by a wide margin. State officials for the 1956-58 term (all Republicans and all re-elected except for the office of lieutenant governor), were: governor, Victor E. Anderson; lieutenant governor, Dwight Burney; state treasurer, Ralph Hill; state auditor, Ray C. Johnson; secretary of state, Frank Marsh; attorney general, Clarence S. Beck.

The members of the state board of education, who are elected on a nonpartisan basis, were: Frank E. Landis, W. Ray Hill, A. J. Crabtree, Morris E. Jacobs, Hamilton Mitten and Raymond M. Gilmore.



MISSILE LAUNCHERS mounted in launching position aboard the U.S.S. "Boston," U.S. guided missile cruiser. Photograph was taken during manoeuvres in Caribbean sea in March 1956

Five constitutional amendments were voted on, and the following three were approved at the election: (1) to allocate all money received from fines and penalties for violations of the laws prohibiting the overloading of vehicles upon the public roads and highways as follows: 75% in a fund for state highways, and 25% to the county general fund of the county where the fine or penalty is paid; (2) to authorize the legislature to tax grain and seed produced or handled in the state upon some basis other than its valuation; (3) to authorize the legislature to fix the salaries of executive officers without the present restriction that such salaries may not be changed more than once in any eight-year period. A proposed ton-mile tax law initiated by petition was defeated by the voters.

Education.—Of the 5,196 school districts authorized to provide only elementary education during 1954-55, 3,787 were in operation providing instruction for 54,846 pupils under the direction of 4,341 teachers. Elementary instruction was also provided in 469 high school districts to 141,911 pupils under the direction of 4,697 teachers. There were 438 high schools in operation with enrolment of 62,548 under the direction of 3,431 teachers. Total expenditures for public elementary and secondary schools in 1954-55 were \$74,669,763. The state university is located in Lincoln; there are three other universities, a municipal university in Omaha, Creighton (Catholic) in Omaha and Nebraska Wesleyan (Methodist) in Lincoln. There are 13 four-year colleges and 4 junior colleges. There are 258 private, parochial and denominational schools in the state, with a total enrolment in 1954-55 of 37,819. The state holds 1,628,705 ac. of land, valued at \$30,378,205 in 1956, as a permanent endowment for its public schools. The permanent public school endowment fund was \$14,064,573. The commissioner of education in 1956 was Freeman Decker.

Social Insurance and Assistance, Public Welfare and Related Programs.—For the biennium 1955-57 the legislature appropriated \$37,039,131 for public assistance, \$20,320,200 of which would be from federal funds. During the first six months of 1956 there was an average case load of 809 persons per month receiving aid to the blind with average payments of \$65.19; 17,498 persons per month receiving old-age assistance with average payments of \$52.50; 2,696 families receiving aid for dependent children with average payments of \$98.77; and 858 persons receiving aid to the totally and permanently disabled with average payments of \$55.70. During 1955-56 a total of \$16,484,422 was expended on these public assistance programs.

The state maintained 17 charitable, mental, reformatory and penal institutions under the supervision of the state board of control. On July 1, 1956, the total population of these institutions numbered 8,811. The state had 136 hospitals with 14,290 beds.

Communications.—The total road mileage of the state in 1956 was 94,387, of which the state maintained approximately 9,900 mi. There were 5,783 mi. of steam railway. The 1955 legislature appropriated \$88,480,279 for highway purposes for the 1955-57 biennium, approximately \$35,240,000 of which was to come from federal funds. During 1955-56 a total of \$41,211,287 was expended for highway purposes.

There were 248 airports in the state, 5 of which were state-owned and 66 municipally owned. There were 22 daily newspapers and 447 other newspapers and periodicals of all kinds published in the state. The state had 26 radio stations and 9 television transmitters.

Banking and Finance.—The state budget for the 1955-57 biennium was \$237,321,487, the largest in its history. For the fiscal year ending June 30, 1956, the state's revenues were \$128,016,270, expenditures were \$112,093,658. Federal grants furnished approximately \$31,527,820. The net long term debt of the state was nil.

Table I.—Principal Crops of Nebraska

Crop	Indicated 1956	1955	Average, 1945-54
Corn, bu.	111,726,000	107,424,000	220,863,000
Wheat, bu.	60,211,000	78,225,000	80,211,000
Oats, bu.	17,700,000	52,754,000	59,800,000
Barley, bu.. . . .	2,898,000	3,800,000	7,028,000
Rye, bu.	1,674,000	1,705,000	2,249,000
Potatoes, cwt. . . .	2,368,000	2,340,000	3,758,000
Sugar beets, short tons	852,000	665,000	729,000
Hay, tons	5,314,000	5,412,000	5,268,000
Sorghum grain, bu.	10,054,000	7,920,000	3,556,000
Beans, dry (100-lb. bags). . . .	1,054,000	1,141,000	1,016,000
Soybeans, bu.	1,850,000	1,890,000	1,297,000

Source: U.S. Department of Agriculture.

Table II.—Principal Industries of Nebraska

	All employees, 1954	Salaries and wages, 1954 (in 000s)	Value added by manufac- ture, 1954 (in 000s)	Value added by manufac- ture, 1953 (in 000s)
Food and kindred products . . .	27,770	\$107,825	\$204,118	\$203,237
Furniture and fixtures	1,025	3,793	6,467	*
Electrical machinery	2,233	7,609	18,015	17,227
Transportation equipment	1,255	4,802	7,129	6,440
Miscellaneous manufactures . . .	5,934	21,155	33,672	35,012

*Withheld because the estimate did not meet publication standards, either on the basis of the associated standard error of estimate or on the basis of a consistency review.

Source: U.S. Department of Commerce, 1954 Census of Manufactures, preliminary report.

On June 30, 1956, there were 293 state banks in the state with total resources of \$434,790,998 and 123 national banks with total resources of \$1,111,450,000. There were 44 co-operative credit associations with assets of \$6,720,937.

Agriculture.—A total of 96.8% of the land area is in farms. In 1956 there were approximately 100,846 farms in the state with a total area of 47,466,828 ac. The average size of farms was 470.9 ac., and 38.6% of the farms were operated by tenants.

Manufacturing.—There were (1956) 1,281 manufacturing establishments (exclusive of printing and newspaper establishments, bottling companies and bakeries with less than 5 employees) with 55,532 production workers. About 48% of all manufacturing employees in the state were engaged in the processing of foods. (J. W. Rs.)

Mineral Production.—The tonnage and value of those minerals produced in Nebraska in 1953 and 1954 whose value exceeded \$100,000 are shown in Table III. Nebraska ranked 35th among the states in value of mineral output in 1954, with 0.3% of the U.S. total.

Table III.—Mineral Production of Nebraska

Mineral	1953		1954*	
	Quantity	Value	Quantity	Value
Total.		\$33,281,000		\$42,393,000
Clays	176,000	187,000	164,000	164,000
Natural gas (000 cu.ft.)	6,748,000	911,000	6,801,000	796,000
Petroleum (bbl.)	6,344,000	17,190,000	7,783,000	21,400,000
Sand and gravel	5,970,000	4,340,000	8,548,000	6,992,000
Stone	1,407,000	2,070,000	2,660,000	3,511,000
Other minerals . . . . .	...	8,583,000	...	10,638,000

*Preliminary.

†Total has been adjusted to eliminate duplication in the value of clays and stone.

Source: U.S. Bureau of Mines.

ENCYCLOPEDIA BRITANNICA FILMS.—*Northwestern States*, 2nd ed. (1956).

Necrology: see OBITUARIES.

Negroes, American. Developments concerning racial de-segregation continued to form the most significant events affecting Negroes in the United States during 1956. While desegregation in public education, housing, parks and recreational facilities continued to receive considerable attention, the most dramatic changes were in the area of public transportation. In two southern cities—Montgomery, Ala., and Tallahassee, Fla.—Negroes organized and carried out mass refusals to patronize local public transit companies because of discriminatory treatment of Negro passengers. The Montgomery movement, which began Dec. 5, 1955, originally sought improved treatment for Negroes within the community's traditional pattern of segregation, but when the Montgomery bus company and city officials refused to grant these first requests, Montgomery Negroes challenged both city and state segregation laws in the courts and won a decision from a federal court three-judge panel in June 1956 declaring intrastate bus segregation unconstitutional. The U.S. supreme court upheld the panel's ruling in November. As the year ended Montgomery city officials were requesting a rehearing of the case and had not ended bus segregation. Meanwhile, Montgomery's 50,000 Negroes continued to refuse to ride the city's racially segregated buses.

Earlier, in April 1956, the U.S. supreme court had refused to review a lower court ruling forbidding racial segregation on intrastate buses in Columbia, S.C. Since the supreme court's action in this case was taken on technical grounds, it did not at that time clearly settle the constitutionality of municipal and intrastate bus segregation. The implications were clear, however, and desegregation of municipal bus service occurred in at least 16 southern communities during the spring of 1956.

Significant changes were also made in the area of interstate travel accommodations during 1956. On Jan. 10 an Interstate Commerce commission order of Nov. 1955 took effect, forbidding segregation of interstate passengers on common carriers and separation of passengers in railroad and bus waiting rooms. Compliance was not consistent throughout the south, but the Southern railroad, the Louisville and Nashville and several other lines operating in the south ceased their practices of segregating passengers on trains and removed signs indicating race in their waiting rooms. While some southern cities in almost every south-



THEA GIBSON receiving trophy from R. H. McMann, president of the U.S. Lawn Tennis association, for placing second in the women's singles championships at Forest Hills, N.Y., Sept. 9, 1956. Earlier in the year Miss Gibson captured tournament titles in France, Italy and Great Britain

In state desegregated waiting rooms in 1956, several southern cities refused to remove signs designating "colored" and "white" waiting rooms, or removed one set of signs, only to replace them with another.

Early in May 1956 the Civil Aeronautics administration banned use of federal funds to build segregated airport passengers' facilities. When Jackson, Miss., refused to comply with the new ruling, funds requested for renovating facilities at that city's municipal airport were withheld.

Public School Desegregation.—Border states made a great deal of progress in desegregating public schools during 1956, but met resistance to the ending of segregation in public education increased in the deep south. A *Southern School News* survey of Oct. 1956 reported 208 newly desegregated public school districts in the 17 formerly segregated states since Sept. 1955, bringing the total number of districts desegregated since May 17, 1954, to 7797. The same survey showed that 319,184 Negro and 2,000,000 white children were attending school in "integrated situations," that is, in situations where Negro children were attending desegregated schools or were enrolled in districts where desegregation had begun. An estimated 2,400,000 Negro children in the southern and border states were still going to school under segregated conditions.

There were no desegregated districts in eight states—Alabama, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina and Virginia—and only one in Tennessee. The same eight states which had made no move to desegregate their public schools also passed numerous pieces of pro-segregation legislation during 1956, most of it designed to evade the supreme court's school decision.

Higher Education.—Desegregation proceeded at a steady pace in formerly segregated colleges and universities in the south, with a total of 164 formerly all-white and at least 27 formerly all-Negro institutions of higher learning changing racial policies up to May 1956. In October, 110 of the 208 tax-supported white public colleges in the south admitted or were willing to admit Negro students, and an estimated 2,000 Negroes were enrolled in formerly white institutions. All state-supported institutions of higher learning in Kentucky, Maryland, Missouri, Oklahoma and West Virginia were open to qualified students, regardless of race, by the fall of 1956.

Five states—Alabama, Florida, Georgia, Mississippi and South

Carolina—continued to enforce segregation in all their state-supported colleges in 1956, though all these states except South Carolina had at least one private college admitting students of both races. Suits challenging segregation practices at the college level were in process in three states—Alabama, Florida and Georgia—and two of them, Alabama and Florida, had already received lower court orders to admit Negro students.

Employment and Income.—Pres. Dwight D. Eisenhower's Committee on Government Contracts, charged with obtaining fair employment practices in businesses and industries working under contract with the federal government, stated in its third annual report, Oct. 1956, "The nation's business and industrial leaders are responding in encouraging numbers to the philosophy that Equal Job Opportunity is both good business and good citizenship." The committee cited particular gains in employment-on-merit practices in the aircraft, oil refining, petrochemical, meat packing, atomic energy and communications industries.

Parks and Recreation.—Following supreme court action in 1955 banning segregation in state parks and municipal golf courses, park desegregation increased considerably in 1956. Cities completely desegregating municipal park facilities in 1956 included Baltimore, Md.; Tulsa and Oklahoma City, Okla.; and San Antonio, Beaumont and Austin, Tex. At least 11 southern cities (including Pensacola, Fla.; Winston-Salem, N.C.; and Portsmouth, Va.) ended segregation in their city golf courses, and Corpus Christi, Tex., opened its municipal swimming pool to all citizens of the city.

Housing.—Segregation and discrimination in housing remained an acute problem for Negroes in the U.S., but a few isolated gains were reported in both public and private projects during 1956. Washington, D.C., for example, completed desegregation of all of its 5,308 public housing units in January, and the St. Louis (Mo.) Housing authority, under court order to end segregation in its public projects, integrated one formerly white unit in January.

Outstanding Achievements.—The Women's International League for Peace and Freedom presented its 1956 Jane Addams Children's Book award to Arna Bontemps for his *Story of the Negro*, and two books by Langston Hughes, *A Pictorial History of the Negro* and *I Wonder as I Wander*, and one by Margaret Just Butcher, *The Negro in American Culture*, were well received. In the fall of 1956, soprano Mattiwilda Dobbs was highly praised as she made her debut as Gilda in *Rigoletto* with the New York Metropolitan Opera, thus becoming the third Negro singer to be featured at the Metropolitan and the first Negro to sing a non-Negro romantic lead.

(See also CIVIL RIGHTS; EDUCATION.)

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(P. VN.)

Nehru, Jawaharlal (1889—), Indian statesman, was born at Allahabad, United Provinces, Nov. 14. For his early career see *Encyclopædia Britannica*. Arrested in 1942, following Congress' call for civil disobedience, he was released in 1945, and in 1946 took a leading part in the negotiations with the British on Indian independence. In September of that year he became prime minister of an all-Indian interim government. On Aug. 15, 1947, he was appointed prime minister and minister for external affairs of the independent dominion of India, posts in which he continued when his country became a republic on Jan. 26, 1950, and in which he was

confirmed by the 1951-52 general elections.

During 1956 domestic problems engaged much of Nehru's attention. On May 15 he presented to parliament India's second five-year plan. More than once he rebuked the rioters in Bombay and Ahmedabad who violently opposed the provisions of the States Reorganization bill, and he continued to denounce Portugal for the retention of Goa. In the Kashmir dispute he remained adamant in his support of India's claims.

In world affairs he pursued a policy of neutrality and the maintenance of friendly relations with all countries. He criticized both the SEATO (Southeast Asia Treaty organization) and Baghdad pacts and the supply of U.S. arms to Pakistan. He attended the Commonwealth prime ministers' conference in London in July, and on his return journey to India, after visiting Konrad Adenauer the German chancellor in Bonn, Ger., he met Marshal Tito, president of Yugoslavia, and Gamal Abdel Nasser, president of Egypt, on Brioni on July 18, and had further talks with Nasser in Cairo, Egy., on July 20.

When the Suez canal crisis arose Nehru urged the nations involved to reach a peaceful settlement. On Nov. 1 he wrote in a letter to United Nations Sec.-Gen. Dag Hammarskjöld that he was "profoundly shocked" that the British and French, instead of trying to stop Israel's aggression against Egypt, were themselves invading Egyptian territory, and warned that this was "likely to lead to the gravest possible consequences all over the world." (See also INDIA.)

Nepal. Nepal is a Himalayan kingdom lying between India and Tibet. Area: 54,510 sq.mi. Pop. (1954 census) 8,431,537. Aboriginal stock is Mongolian, with Hindu admixture. Language: Gorkhalis (Gurkhas) speak Parbatia, of Sanskrit origin; Bothias use Tibetan; Newars, from southern India, speak Gubharius, resembling Tibetan but with many Sanskrit words. Religion: Buddhism overlaid with Hinduism. Chief towns (pop. 1941 est.): Kathmandu (cap.) 108,805; Patan 104,928; Bhatgaon 93,176. King: Mahendra Bir Bikram; prime minister in 1956, Tanka Prasad Acharya.

KING MAHENDRA AND QUEEN RATNA OF NEPAL riding through the streets of Kathmandu after coronation May 2, 1956



History.—After many years of unrest, the way was apparently being paved during 1956 for a democratic government. As the existing parties could not agree on a coalition, the young king Mahendra reigned after his father's death (March 13, 1955) with the help of five advisers. On Jan. 27, 1956, at the king's invitation, Tanka Prasad Acharya formed the fifth government to be set up since the insurrection of Nov. 1950 against the oligarchical rule of the Rana family. The new cabinet was composed of four Praja Parishad representatives and three former royal advisers. However, the Nepali congress, the biggest political organization in the country, presided over by Subarna Shamsher, the commander of the Nepali forces during the insurrection, remained in the opposition. King Mahendra was crowned and enthroned in his capital on May 2, the world's only Hindu monarch, the ninth king of the Shah dynasty founded in 1742.

On Sept. 20 an agreement was signed at Kathmandu between Nepal and the People's Republic of China. Nepal would establish a consulate general at Lhasa, Tibet, while China would open a consulate general at Kathmandu. Nepal would establish three trade agencies in Tibet, while China might open an equal number of trade agencies in Nepal.

Education.—Schools (1954): primary 921, pupils 26,186, teachers 1,278; secondary and technical 399, pupils 46,105, teachers 2,246. Institutions of higher education 21, students 1,316, teaching staff 143.

Finance and Banking.—Monetary unit: Indian rupee and Nepalese rupee (called *mohur*) with an official exchange rate of N.Rs. 150 = I.Rs. 100 (for nonessential imports N.Rs. 175 = I.Rs. 100), and N.Rs. 7.14 to the U.S. dollar. Budget (1953-54 est.): revenue N.Rs. 42,500,000, expenditure N.Rs. 52,500,000; (1954-55 est.) revenue N.Rs. 43,600,000, expenditure N.Rs. 59,500,000.

Foreign Trade.—With India (April-Dec. 1952): imports Rs. 32,200,000, exports Rs. 58,600,000. Principal exports: grain, jute, timber, oilseeds, clarified butter, potatoes, medicinal herbs, cattle, hides and skins. Principal imports: textiles, cigarettes, iron and steel, cement, motor fuel, machinery, sugar.

Transport and Communications.—Roads (1955): 350 mi. suitable for motor vehicles. Railways (1955) 127 km.

Nervous System: see PSYCHOSOMATIC MEDICINE.

Netherlands. This kingdom of northwest Europe is bounded north and west by the North sea, east by western Germany and south by Belgium. Area: 12,524 sq.mi. Pop.: (1947 census) 9,625,499; (1956 est.) 10,852,000. Language: Dutch. Religion (1947): Roman Catholic 38.50%; Dutch Reformed 31.03%; Reformed Churches 7.93%; nonchurch members 17.04%. Chief towns (pop., 1954 est.): Amsterdam (official capital) 858,702; Rotterdam 704,646; The Hague (seat of government) 590,755; Utrecht 241,723; Haarlem 165,142; Eindhoven 149,460; Groningen 140,456; Tilburg 126,939; Nijmegen 116,989; Enschede 113,513; Arnhem 114,002. Ruler, Queen Juliana; prime minister in 1956, Willem Drees.

History.—The quadrennial election for the second chamber took place on June 13, 1956. It coincided with a dissolution of the states-general because of a revision of the constitution, the main feature of which was an increase in the number of chamber members: for the second chamber from 100 to 150, for the first chamber from 50 to 75. These increases, however, were to be effective after a second reading of the revision bill by the newly elected states-general. The bill was voted by the new second chamber on July 11 and by the first chamber on Aug. 21. The chambers met under the new constitution on Nov. 6.

Electioneering was keen, especially between the two largest contestants, the Labour party and the Catholic People's party (C.P.P.). The outcome for the second chamber was (1952 figures in parentheses): Labour 34 seats (30), C.P.P. 33 (30), Anti-Revolutionary party 10 (12), Christian Historical union 8 (9), People's Party for Freedom and Democracy (Liberal) 9 (9), Political Reform party 2 (2), Communists 4 (6). These shifts must be considered remarkable under the system of proportional representation.

Party dissensions, made apparent during the campaign, proved to be of great importance when a new cabinet had to be formed. After the election Queen Juliana invited successively five political leaders of different parties to form a new government. All failed. The main point of dissension between the Labour party and the C.P.P. was the policy intended to encourage the people in acquiring personal property. On Sept. 18, the constitutional date for the annual opening of the session of parliament, the old cabinet was still in office; so the queen's address confined itself to generalities concerning foreign affairs.

On Oct. 12, after a four-month crisis, Willem Drees (Labour) succeeded in forming a new cabinet; the new coalition consisted again of members of the Labour party (5), the Catholic People's party (5), the Anti-Revolutionary party (2) and the Christian Historical union (1). An elastic formula for the personal property issue was found.

Not until Oct. 23 could Drees announce a general outline of his policy. He reaffirmed the traditional stand in foreign affairs, but he laid full stress on the economic, social and financial problems raised by the continued boom of prosperity. The gold and currency reserves of the Netherlands bank had fallen from 4,655,000,000 florins on June 27, 1955, to 4,317,000,000 florins on June 26, 1956. This decrease was considered a token of an excessive national spending. Consumption was again stimulated by some slackening of wage controls, to which the previous government, under parliamentary pressure, had agreed in March. In addition to a 3% bonus on wages, to be paid out of 1955 profits, the government allowed a differentiated increase in wages up to 6%, to be effected on or before Sept. 1. Because of the scarcity of manpower, negotiations between employees and trade-union leaders resulted in wage increases up to the maximum for about 85% of the total working population.

Drees announced the firm intention of the new government to maintain the hitherto successful policy of price stabilization and to consider measures for checking various forms of national spending; price controls would be mainly of general character. Government spending had also to be reviewed, as the budget, presented by the old cabinet in September, showed a deficit of 786,000,000 florins. During 1956 the Netherlands bank raised the bank rate three times from 2½% on Jan. 1 to 3¾% on Oct. 22.

Dutch-Indonesian relations worsened during the year. On Aug. 4 the Indonesian government repudiated the whole of Indonesia's debt to the Netherlands (estimated at 649,000,000 florins). The issue of sovereignty over Netherlands New Guinea continued to divide the two countries. There was much anger in the Netherlands, even in pro-Indonesian circles, at the manner in which the Djakarta trials against Dutchmen charged with subversive activities had been conducted and influenced by Indonesian mobs.

In June the foreign press spread rumours about dissension at the Netherlands royal court. This had been made acute by the presence of a woman faith healer whose services had been employed by the queen because of a congenital partial blindness of Princess Marijke, the youngest daughter of the royal couple. Three elderly statesmen advised Queen Juliana and Prince Bernhard, by their personal request, and consequently changes in the royal household were announced in a joint statement by the queen and the prince. Rumours concerning the possibility of the queen's abdication were strongly denied.

(See also EUROPEAN UNITY; INDONESIA; NETHERLANDS ANTILLES; NETHERLANDS NEW GUINEA; SURINAM.) (M. Ry.)

Education.—Schools (1954): primary 7,597, pupils 1,451,000, teachers 41,034; advanced elementary 981, pupils 157,000, teachers 5,733; secondary 378, pupils 98,876, teachers 7,931; vocational (1953) 1,018, pupils 280,480, teachers 12,000. Teachers' training colleges (primary) 86, students 12,774. Institutions of higher education 10 (including 6 universities), students (1953) 28,206.

Finance and Banking.—Monetary unit: gulden or florin, with an exchange

rate of 3.829 guildens to U.S. \$1 in March 1956. Budget (1955 est.): revenue 6,015,000,000 guildens, expenditure 6,625,000,000 guildens, (1956 est.) revenue 6,102,000,000 guildens, expenditure 6,682,000,000 guildens. Internal debt (1955) 16,431,000,000 guildens; external debt 2,013,000,000 guildens. Currency circulation (Dec. 1954) 3,728,000,000 guildens, (Dec. 1955) 4,101,000,000 guildens. Deposit money (Dec. 1954) 5,444,000,000 guildens, (Dec. 1955) 5,866,000,000 guildens. Gold and foreign exchange reserves of the Central bank (March 1955) U.S. \$1,274,000,000, (March 1956) U.S. \$1,296,000,000.

Foreign Trade.—(1955) Imports 12,189,000,000 guildens; exports 10,211,000,000 guildens. Main sources of imports: Belgium-Luxembourg 18%; Germany 18%; other continental E.P.U. (European Payments Union countries) 13%; U.S. and Canada 15%; U.K. 9%; other sterling area 7%; Latin America 6%. Main destinations of exports: Germany 17%; Belgium-Luxembourg 14%; other continental E.P.U. 26%; U.K. 12%; other sterling area 9%; U.S. and Canada 7%; Latin America 6%.

Transport and Communications.—Roads (1954): 4,127 km. Motor vehicles in use (April 1955): passenger 244,750, commercial 102,580. Railways (1955) 4,600 km.; passenger-km. (1955) 7,477,000,000; freight, ton-km. (1955) 3,432,000,000. Navigable inland waterways (1955) 6,917.7 km., including 2,634.8 km. for ships of more than 400 tons. Shipping: merchant vessels of 100 gross tons and over (July 1955) 1,716; total tonnage 3,695,610. Cargo in Netherlands ports (metric tons, 1955): loaded 23,604,000; unloaded 56,412,000. Air transport (1955): passenger-km. 1,485,444,000; freight, ton-km. 60,072,000. Telephones (Jan. 1955) 1,021,202. Licensed radio receivers (1954) 2,487,000.

Agriculture.—Main crops (metric tons, 1955; 1954 in parentheses): wheat 350,000 (397,000); rye 465,000 (512,000); barley 264,000 (207,000); oats 582,000 (465,000); potatoes 4,078,000 (3,999,000); rapeseed 19,000 (17,000); linseed 27,000 (24,000); dry peas 131,000 (93,000); flax fibre 40,900 (35,900). Livestock (Sept. 1955): cattle 2,989,000; sheep 378,000; pigs 2,364,000; horses used in agriculture, 220,000. Meat production (metric tons, 1954): beef and veal 181,000; pork 231,000; mutton and lamb 7,000. Dairy production (metric tons, 1954) milk (delivered) 5,892,000; butter 76,800; cheese 156,000. Fish landings (1954): 300,800 metric tons.

Industry.—Fuel and power (metric tons, 1955): coal 11,892,000; lignite 255,600; crude oil 1,023,600; manufactured gas (delivered) 2,004,000,000 cu.m.; electricity 11,184,000,000 kw.hr. Production (metric tons, 1955): pig iron 670,800; crude steel 973,200; zinc, smelter, 28,440; tin, smelter 27,000; cement 1,101,600; cotton yarn 69,840; wool yarn 28,800; rayon filament yarn 31,200; rayon staple fibre 12,720. New and rebuilt dwellings completed (1955): 60,816. Merchant vessels launched (100 gross tons and over, 1955) 396,800 gross tons. Index of production (Feb. 1956: 1953 = 100) 113.

ENCYCLOPÆDIA BRITANNICA FILMS.—Holland (1955).

Netherlands Antilles. An integral part of the kingdom of the Netherlands, yet sovereign and autonomous in its control of its domestic affairs, the state known as the Netherlands Antilles consists of six islands in the Caribbean, in two groups (of three islands each) more than 500 mi. apart. The three Leeward Islands consist of Curaçao (173 sq.mi.) with a population (1955 estimate) of 122,550, Aruba, 50 mi. west of Curaçao, with an area of 69 sq.mi. and a population (1955 estimate) of 55,483, and Bonaire, 40 mi. east of Curaçao, with an area of 95 sq.mi. and a population (1955 estimate) of 5,661. These three are about 40 mi. from the coast of Venezuela. Northeast of them, in the so-called Lesser Antilles, and lying between St. Thomas (of the Virgin Islands) and Antigua, are the three Windward Islands, St. Martin (17 sq.mi., the northern part constitutes a French colony), pop. (1955 estimate) 1,607; St. Eustatius (7 sq.mi.), pop. (1955 estimate) 1,055; and Saba (5 sq.mi.), pop. (1955 estimate) 1,117. The total population of the 366 sq.mi. at the end of 1955 was estimated to be 187,473. Willemstad on Curaçao is the capital; pop. (1953 est.) 44,062.

History.—A. A. M. Struycken was governor until Oct. 25, 1956, when he departed for the Netherlands to become vice-premier. F. E. J. van der Valk then became acting governor, and Ephraim Jonckheer continued to serve as prime minister. The first important test of the new constitution of the Netherlands, so far as concerns the Netherlands Antilles, arose when the governor objected to the appointment as minister of justice and deputy prime minister of a lawyer (S. W. van der Meer) who had been minister of social policy and deputy minister of justice and had continued this professional practice, even opposing his own ministry in court. The prime minister insisted that the governor had nothing to say as to who should occupy any post in the cabinet, and took the matter to The Hague. The prime minister of the Netherlands acted as arbitrator, and secured acceptance of the principle of incompatibility of independent prac-

tice of the legal profession with tenure of the ministry of justice. Van der Meer relinquished his practice and became minister of justice.

In April the government of Aruba contracted for the construction of the largest sea water distillation plant in the world, producing 2,700,000 gal. of potable water daily, at an estimated cost of about 50 cents per gallon. That government also contracted for the establishment of a large hydroponic farm, modelled on the Robins hydroponic farm in Puerto Rico, and expected to produce an ample supply of fresh vegetables. (C. E. Mc.)

Education.—On Jan. 1, 1956, there were 59 elementary schools with 511 teachers and 17,884 pupils, 49 higher elementary schools with 17,653 pupils, 3 secondary schools with 611 students and 4 technical schools with 799 students.

Finance.—The monetary unit is the Netherlands Antilles gulden or florin, valued at 53.0264 cents U.S. currency, official rate, in 1956. The central budget for the fiscal year ending March 31, 1957, estimated revenue at 44,433,000 florins and expenditure at 44,385,000 florins. The public debt at the end of 1955 was 6,071,000 florins. The cost-of-living index (Curaçao) stood at 106 in June 1956 (1953=100).

Trade and Communications.—Exports in 1955 totalled 1,513,740,000 florins; imports were 1,565,967,000 florins. Almost all the exports consisted of petroleum products, and about 90% of the imports consisted of crude petroleum, principally from Venezuela. The U.S. supplied about two-thirds of the nonpetroleum imports.

The highway mileages of the islands of the Netherlands Antilles in 1952 were as follows: Curaçao 220; Aruba 165; Bonaire 32.5; St. Martin 17; Saba 4.5; and St. Eustatius 2.5. On Dec. 31, 1955, 10,992 motor vehicles were in use on Curaçao and 5,896 on Aruba. Telephones (Dec. 31, 1955) totalled 5,684. In 1955, 13,022 vessels entered the ports of Curaçao and Aruba.

Manufactures.—Exports of refined petroleum products produced by the three refineries—two on Curaçao and one on Aruba—totalled 37,527,643 metric tons in 1955, including 23,239,375 tons of fuel oil, 3,297,218 tons of ordinary gasoline and related products and 1,177,854 tons of aircraft gasoline. (J. W. Mw.)

Netherlands New Guinea.

The western part of the island of New Guinea in the western Pacific, with adjacent smaller islands, is constitutionally part of the kingdom of the Netherlands. Area: 160,618 sq.mi. Pop. (1955 est.): 700,000 (of whom about 400,000 are in districts under regular Dutch administration), mainly Papuans but including about 10,000 Europeans and 13,000 Asians. Principal towns: Hollandia (cap.), pop. (1954 est.) 11,322; Manokwari, Sorong, Biak, FakFak and Merauke. Governor in 1956: Jan van Baal.

History.—In 1956 activities in the field of economic development of the territory were continued. Special attention was paid to the agrarian development and the extension of the sea and air communications.

Of the mechanized experimental rice polder near Merauke the first rice crop of 150 tons was harvested. Sea and airport accommodations were further improved. Ocean steamers could now berth at Manokwari and Biak. The construction of a ship repair establishment with transverse slipway and workshops at Manokwari for ships up to 2,500 tons was nearing completion. A medium large sawmill constructed at Manokwari, with an annual capacity of 12,000 cu.m. of sawn timber, started production. Priority was given to the building of houses for native workers in the towns. A new hospital at Hollandia was in construction.

The fight against malaria and yaws was continued on a large scale. The indoor-spraying with DDT insecticide proved a success. By the end of 1956 about 300,000 persons had been inoculated with PAM serum. On Jan. 1, 1956, the Education and Subsidy ordinance came into force. This meant that an important step was made toward a systematic development of education among the Papuan population.

Education.—Schools (1954): primary 557, pupils 28,949, teachers 879; post-primary (including 1 Roman Catholic secondary) 4, pupils 289, teachers 14; vocational 4, pupils 204, teachers 10 (excluding specialized training courses); primary teachers' training courses, students 220.

Production.—Oil (1954) 554,265 metric tons; (export value 1955) 26,444,000 guildens; sawn hardwood (1954) 16,000 cu.m.

Netherlands Overseas Territories: see NETHERLANDS ANTILLES; NETHERLANDS NEW GUINEA; SURINAM.

Nevada. A state of the mountain group of western states, Nevada was the 36th state to be admitted to the union, on Oct. 31, 1864; it is popularly called the "Sagebrush state" or the "Silver state." Land area 109,789 sq.mi.; water area 751 sq.mi. Pop. (July 1, 1956, provisional est.) 247,000. Population statistics according to the 1950 census were rural 68,458, urban 91,625; white 149,907, nonwhite 10,176; total 160,083. The principal cities with 1950 populations and 1955 population estimates in parentheses are: Carson City, the capital, 3,082 (4,500); Reno, 32,497 (44,500); Las Vegas, 24,624 (44,750); Sparks, 8,203 (13,000); Elko, 5,393 (6,500); Ely, 3,558 (6,155).

History.—A number of important events occurred in Nevada in 1956. A special session of the Nevada legislature convened in January and enacted an entirely new code of laws for the government of Nevada's elementary and secondary schools. Additional funds were appropriated for the schools, for the University of Nevada, for state grants to aid in the construction of hospitals, and for increased old-age assistance payments.

Floodwaters which roared through western Nevada caused an estimated \$3,831,522 in damage to public property and farm lands. Controversies arose over the withdrawal of public domain lands for military purposes and over the disposition of state land to private persons. Nevada's "right-to-work" law was upheld by a court decision granting a preliminary injunction against picketing. A flash flood near Reno claimed the lives of four persons.

Nevada voters turned out in record-breaking numbers for the general election in Nov. 1956. The incumbent, Sen. Alan Bible (Dem.) defeated Clifton Young (Rep.) for the United States senate seat. Walter S. Baring (Dem.) defeated Richard W. Horton (Rep.) in the contest for Nevada's single seat in the lower house of congress. Although Nevada voters were registered almost two to one for the Democratic party, Republican candidates Dwight D. Eisenhower and Richard M. Nixon carried the state by a substantial majority.

On July 1, 1956, elected officers were: governor, Charles H. Russell; lieutenant governor, Rex Bell; secretary of state, John Koontz; state controller, Peter Meriardo; state treasurer, Dan W. Franks; surveyor general, Louis D. Ferrari; inspector of mines, Mervin J. Gallagher; superintendent of state printing, J. A. McCarthy; clerk of the supreme court, Ned A. Turner; superintendent of public instruction, Byron F. Stetler; attorney general, Harvey Dickerson.

Education.—In June 1956 Nevada had 198 elementary schools with an average daily attendance of 31,595; teachers numbered 1,406. High schools totalled 36, with an average daily attendance of 8,908 and a staff of 495 teachers. Kindergarten average daily attendance was 3,075 in 18 kindergartens with 68 teachers. Average daily attendance for all schools was 43,578. Average annual salaries paid to high school teachers was \$4,678, to elementary teachers \$4,276 and to kindergarten teachers \$4,366. State-wide expenditures for elementary and secondary education, all schools, was \$20,978,406 for the year, of which \$6,493,406 was provided as state aid.

Social Insurance and Assistance, Public Welfare and Related Programs.—For the fiscal year ended June 30, 1956, \$2,780,709 was expended by the state health and welfare departments. In addition, \$1,922,587 was expended for old-age assistance benefits to 2,596 persons, who received an average monthly amount of \$61.34. On June 30, 1956, the state prison had 353 men and 11 women inmates; total expenditures for the fiscal year were \$364,221. The Nevada school of industry had 50 boys and 24 girls under school control; total expenditures for the fiscal year were \$109,935. The state hospital for mentally ill persons had 446 patients in average daily residence during the fiscal year; expenditures for the fiscal year were \$570,106. The state children's home had 40 boy and 31 girl residents during the fiscal year, and the cost to the state was \$149,336.

Communications.—During the fiscal year ended June 30, 1956, the total disbursements for highways were \$15,865,255. There were approximately 6,236 mi. of road in the designated state highway system, including secondary roads. Railroad mileage totalled 1,647 in 1955. Motor vehicle registrations on June 30, 1956, totalled 149,382. There were 444 registered aircraft and 27 public airports in 1955.

Banking and Finance.—On July 1, 1956, there were 36 individual banking institutions in the state, of which 30 were branches, 3 were national banks and 3 were state banks. The resources of Nevada banks totalled \$310,104,820, and deposits were listed as \$287,466,363.

The receipts of the state for the fiscal year ended June 30, 1956, amounted to \$65,539,255; the disbursements to \$58,139,456. There was a treasury balance of \$20,572,342. The state had bonds outstanding in the amount of \$2,938,000 for the construction of office and institutional buildings. The par value of bonds and securities held by the state totalled

5,034,702, and they produced an income of \$386,241. Nevada has no income taxes or inheritance taxes. A graduated tax on gambling netted the state \$5,799,185, and a state property tax of 42 cents on each \$100 valuation netted \$2,476,534. The total assessed valuation of the state for the fiscal year 1955-56 was \$557,294,908.

Agriculture.—The total farm value of the principal crops in 1954 was 4,706,000; the total acreage harvested was 365,000. In 1954 the cash come from crops sold was \$5,646,000; from livestock sold, \$33,948,000.

Table I.—Principal Crops of Nevada

Crop	Indicated 1956	1955	Average 1945-54
Barley, bu.	629,000	455,000	722,000
Potatoes, cwt.	396,000	352,000	248,000
Wheat, bu.	439,000	249,000	492,000
Hay, tons	718,000	495,000	609,000
Cattle, bu.	258,000	205,000	277,000
Wool, bu.	126,000	120,000	91,000

Source: U.S. Department of Agriculture.

Manufacturing.—Manufacturing in Nevada is limited in scope and production. In 1947 there were 126 industrial establishments in the state, employing approximately 2,667 persons and paying approximately \$8,409,000 in wages for the year. The value added by manufacturing was approximately \$27,777,000. Expenditures for new plants and equipment totalled \$959,000 in 1947. Chemicals and allied products were being manufactured in ever-increasing quantities at the Basic Magnesium project at Henderson, Nev. (J. E. SPR.)

Mineral Production.—Table II shows the tonnage and value of those minerals produced in Nevada in 1953 and 1954 whose value exceeded \$100,000 (except for talc, an important commodity). In 1954 the state was 6th among the states in tungsten output; second in output of diatomite and mercury, with 27% of the national output of mercury; third in barite and copper; fifth in molybdenum; and produced some magnesium metal. It ranked 28th among the states in the value of its mineral output, with 0.64% of the U.S. total.

Table II.—Mineral Production of Nevada

(In short tons, except as noted)

Mineral	Quantity	Value	Quantity	Value
	1953	1954*	1953	1954*
Total	100,000	\$73,523,000	84,000	\$89,138,000
Asbestos	100,000	615,000	84,000	517,000
Copper	62,000	35,502,000	70,000	41,428,000
Diatomite	102,000	3,563,000	79,000	2,767,000
Fluorite	702,000	1,975,000	654,000	2,217,000
Gold ore	497,000	2,648,000	393,000	2,025,000
Iron ore	4,000	1,145,000	3,000	833,000
Manganese ore	25,000	432,000	13,000	165,000
Mercury (flasks, 76 lb.)	3,000	628,000	5,000	1,315,000
Lead and gravel	2,266,000	2,089,000	3,531,000	2,957,000
Pearl (oz.)	697,000	631,000	560,000	507,000
Silver	1,036,000	1,400,000	1,833,000	2,011,000
Tungsten concentrate (60% WO ₃)	11,000	73,000	6,000	54,000
Vanadium	4,000	13,824,000	5,000	20,048,000
Zinc	6,000	1,337,000	1,000	224,000
Other minerals	...	7,661,000	...	12,070,000

*Preliminary.
Source: U.S. Bureau of Mines.

ENCYCLOPÆDIA BRITANNICA FILMS.—*Far Western States*, 2nd ed. (1956).

New Brunswick. Second largest of the four Atlantic provinces of Canada both in area and in population, New Brunswick was one of the four original provinces of the confederation in 1867. Area: 27,985 sq.mi. Pop.: (1951 census), 556,697; (official est., June 1, 1955), 558,000. Capital, Fredericton, pop.: (1951 census) 16,018 (1956 est.) 20,377. Largest city, Saint John (seaport), pop. (1951 census), 17,779. Other cities (1951 census): Moncton, 27,334 and Edmundston, 10,753.

History.—The Progressive-Conservative government of Premier Hugh John Flemming was returned to office on June 18, 1956, winning 37 of the 52 seats; all members of the executive council were re-elected. The great Beechwood hydroelectric power development on the upper St. John river proceeded ahead of schedule. Summer troop training operations were carried out as usual at Camp Gagetown where several large construction projects were either completed or under way, contracts valued at \$28,000,000 being let during the fiscal year ended March 31, 1955. Work began late in Sept. 1956 on a 22-mi. addition to the Canadian National railways to run from Bartibog to Tomogonops between Newcastle and Bathurst, being built to bring out ore of lead, zinc and copper from the Heath Steele mines. Thousands from Maine and New Brunswick attended New Brunswick's first Potato Blossom festival at Andover, N.B., on July 18, 1956, for the coronation of the Potato Blossom queen.

Education.—Expenditures for education for the year ending March 31, 1956, were \$8,125,896, while revenues for the same period were \$267,338. For the school year ending June 30, 1955, the total enrolment in provincially controlled elementary and secondary schools was 116,069, the average daily attendance 103,742 and number of teachers 4,550.

Public Health and Welfare.—Revenues for the year ending March 31, 1956, were \$3,748,849. The federal government contributed for the year ending March 31, 1955, \$12,945,905 in old-age security pensions to 27,014 pensioners; in family allowances \$15,073,324 for 210,640 children. For the same period 5,808 received in old-age assistance \$2,577,682 (Canada's share 50%), 731 received in blind allowances \$342,277 (Canada's share 75%), and 177 disabled persons received \$76,366 (Canada's share 50%). Mothers' allowances totalled \$1,300,821 in behalf of 2,087 mothers and 6,051 children. The total provincial expenditure for the above pensions and allowances was \$2,720,760. As of May 1956 there were 45 New Brunswick hospitals with 4,464 beds.

Transportation and Communication.—On March 31, 1956, there were 12,997 mi. of roads of which 2,246 were surfaced. For the year ending Dec. 31, 1955, there were 106,648 motor vehicles registered. As of July 1, 1956, there were three active commercial airports. Railway mileage, Dec. 31, 1954, was 1,834.4 mi. Number of telephones at the same date totalled 94,378 (17.3 per 100 of population). In Oct. 1956 there were two television stations (Saint John and Moncton) and ten radio stations.

Banking and Finance.—Revenues for the fiscal year ending March 31, 1956, totalled \$56,708,397 and expenditures were \$56,541,059. Subsidies from Canada totalled \$18,490,070. On March 31, 1956, the total funded debt less sinking funds of \$48,219,243 was \$168,637,401. The net debt was \$108,489,171, a decrease for the year of \$281,749. For the year ending Sept. 30, 1955, 161 credit unions, with total assets of \$9,154,079, lent \$4,865,332 to members.

Agriculture.—The cash income from sale of farm products in New Brunswick for 1955 totalled \$47,324,000, while the net income from farming operations was \$27,273,000. For 1955 the wheat harvest was 40,000 bu.; oats, 4,110,000 bu.; barley 127,000 bu.; buckwheat, 173,000 bu.; potatoes, 15,510,000 bu.; and hay 916,000 tons. Estimates for 1956 were larger for all except potatoes and hay. On Dec. 1, 1955, there were 180,000 cattle, 70,000 hogs, 38,000 sheep, and 25,000 horses on farms. There were 1,291,000 poultry on farms on June 1, 1956.

Fisheries, Furs and Forestry.—In 1955, 254,978,000 bd.ft. of lumber were cut, spruce forming far the largest amount. Fisheries statistics for 1955 showed that 152,514,000 lb. of fish valued at \$6,431,000 were landed (lobster, cod and smelt in that order). For the 1954-55 season 61,171 pelts were produced, valued at \$356,725.

Manufacturing.—In 1954, 22,107 employees in 1,057 establishments were paid \$55,709,428 to produce goods with a selling value of \$287,350,600, from materials costing \$157,215,921. The gross value of products of the three leading industries, with number of employees in parentheses, were: pulp and paper \$88,761,805 (4,046); fish processing, \$20,026,400 (2,742); sawmills, \$17,509,665 (2,496).

Mining.—At the end of Dec. 1955 there were in effect 41,624 mining claims. Mining production for the calendar year 1955 totalled \$14,320,000 (mostly nonmetallics, bituminous coal amounting to 869,888 tons). Extensive mineral exploration continued during the year with extremely large deposits of base metals (lead, zinc and copper) in the Bathurst and Newcastle areas. Tungsten and manganese were also being mined in the province. (M. P. BE.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Maritime Provinces of Canada* (1943).

New Caledonia: see PACIFIC ISLANDS, FRENCH.

Newfoundland and Labrador. A province of Canada, Newfoundland joined the confederation in 1949. Area: Newfoundland Island, 42,734 sq.mi.; Labrador, 112,630 sq.mi. Pop.: (1951 census) Newfoundland 361,416, Labrador 7,890; in Oct. 1955 the official estimate for both was 416,000. The capital is St. John's, pop. (1951 census) 52,873; largest towns are (1951 census) Bell Island 10,291; West Corner Brook 6,831; Wabana 6,460.

History.—The Liberal government which had been in power since 1949 under Premier J. R. Smallwood was returned for the third time in the election on Oct. 2, 1956. In the landslide victory, the Liberal government received 32 of the 36 seats; the Progressive-Conservative party won the remaining 4 seats. The lieutenant-governor in 1956 was Sir Leonard C. Outerbridge; chief justice, Sir Albert Walsh.

In October a transatlantic telephone relay station was opened, one of the major links in the new communication system joining Canada with the United States and Great Britain by submarine cable telephone.

Mining operations in 1956 were focused on encouraging uranium prospects and on new discoveries of copper and asbestos. The M. J. Bohlen mining interests were spending \$15,000,000 at Tilt Cove, \$5,000,000 at Gull Lake and \$5,000,000 at Little Bay in developing copper mines and concentrating mills; and \$25,000,000 at Baie Verte to develop vast asbestos deposits.

Forests contributed about 33% of Newfoundland's income as compared with 14.7% from mining and 11% from fishing. The huge Bowater pulp and paper mill in 1956 increased production to nearly 350,000 tons of newsprint per year; the Anglo-Newfoundland Development company increased production to almost 250,000 tons. The royal commission on forestry recommended a third paper mill.

Expansion of U.S. military installations in Newfoundland, which employed more than 5,000 local civilians in 1956, continued in aiding prosperity.

Education.—In 1954 there were 93,000 students and about 2,700 classrooms with 2,650 teachers. A new \$10,000,000 university was contemplated, the site having been chosen and plans prepared. The education department had \$7,900,000 operating expenses in 1954.

Public Health and Welfare.—In 1954 there were slightly more than 1,600 general hospital beds in Newfoundland, 54 in nursing stations and 431 in cottage hospitals. There were slightly more than 700 beds at the mental hospital. Payments for family allowances totalled in 1955 more than \$1,000,000 per month, 173,395 children having received \$1,039,521 in November. There were 886 children added to the list that month. During 1955 a total of 15,693 old-age pensioners received \$7,082,969. Mothers' and dependents' allowances for fiscal year 1954-55 amounted to \$2,300,000; child welfare, \$250,000; blind persons' allowances, \$158,000; old-age assistance, \$1,825,000; disabled persons, \$336,000; home for aged and infirm, \$151,500; orphanage grants, \$60,000.

Transportation and Communication.—The main transportation service is Canadian National railways, spanning the island with a 547-mi. narrow-gauge line. In 1954 the total tonnage of freight carried was 123,698. In 1954 there were 6,288 mi. of roads, all classes. For the year ending Oct. 30, 1955, there were 26,150 automobiles, 11,016 commercial vehicles and 43,326 drivers. There were 50,100 radio sets and 6,000 television sets. The first TV commercial station opened in Sept. 1955 at St. John's.

Banking and Finance.—Bank clearings of the 48 banks during the 1954-55 fiscal year totalled \$326,813,394. In the 1955-56 fiscal year revenue was \$39,340,000 and expenditure \$39,338,000; for 1956-57 estimated revenue and expenditure were \$42,755,000 and \$42,574,000, respectively. The funded debt in 1953-54 was \$15,000,000, less sinking fund assets of \$1,374,216.

Agriculture, Fisheries, Furs and Forests.—Farm population constitutes only about 6% of total population, and agricultural income is calculated at less than 4% of total income, according to the royal commission on agriculture.

There were 626,357,540 lb. of various types of fish landed in 1954, valued at \$15,111,791. In 1955 there were 17 filleting and freezing plants.

The multimillion-dollar mink industry expected to produce 25,000 mink in 1955 and 50,000 in 1956. The seal fisheries yielded 55,561 sealskins or pelts in 1955. There was not much activity in fur trapping. Sawmills produced 61,000,000 bd.ft. in 1955, much of which was low-grade lumber. Exports of newsprint in 1953 were valued at \$59,145,874; exports of sulphite pulp \$5,500,000. A total of 8,000 men earned a little more than \$22,000,000 in 1953 in woods operations.

Mining.—Mineral production in Newfoundland and Labrador in 1954 was valued at \$44,569,000. The leading mineral products were zinc, iron, lead and copper. Fluorspar, lime and gypsum were also exploited.

(Ec. A. S.)

New Guinea: see NETHERLANDS NEW GUINEA; PAPUA-NEW GUINEA; TRUST TERRITORIES.

New Hampshire. One of the New England states of the United States and one of the original 13. New Hampshire is popularly known as the "Granite state." Area: 9,304 sq.mi., including 287 sq.mi. of inland water. Estimated population, July 1, 1956, was 560,000; (1950 census) 533,242. As of the 1950 census, 306,806 persons, or 57.5%, resided in urban territory and 226,436, or 42.5%, in rural territory. There were 532,275 whites (of whom 58,134 were foreign-born) and 967 nonwhites in 1950. Capital: Concord, with pop. (1950) of 27,988. Other cities: Manchester 82,732; Nashua 34,669; Portsmouth 18,830; Berlin 16,615; Dover 15,874; and Keene 15,638.

History.—Town meetings were held on March 13, 1956. On the same day a preferential presidential primary election was held, the first in the nation in 1956. Pres. Dwight D. Eisenhower received 56,464 Republican votes and Vice-Pres. Richard M. Nixon received 22,936 write-in votes, a surprising showing which materially aided his vice-presidential candidacy later in the year. Sen. Estes Kefauver received 21,707 Democratic ballots for the presidential nomination. Also on March 13 delegates were elected to the 1956 constitutional convention, authorized by the state legislature in 1955. There were 456 members chosen, including 66 women. The constitutional convention convened on May 15 and adjourned on June 13. It was hoped that the convention

would recommend to the electorate amendments to broaden the basis of state taxation, to reduce the size of the state legislature and modify or define further the powers of the governor of the state. The convention was utterly unable to agree upon a measure of tax reduction or a proposal to reduce the size of the legislature. In the end, three proposed amendments of a minor nature were submitted to the electorate at the general election on Nov. 6, all of which received the required two-thirds vote. Thus the perennial problem of an adequate state revenue was left unsolved. The biennial state primary election was held on Sept. 12.

In the general election of Nov. 6, the state's presidential vote was for Eisenhower, about 176,000; for Stevenson, about 90,000. For governor of New Hampshire Lane Dwinell (Republican); the incumbent, received more than 141,000 votes; John Shaw (Democrat) about 117,000.

On June 8 the state supreme court upheld the constitutionality of the act passed by the general court in 1953 providing for the investigation of subversive activities in New Hampshire. Attorney General Louis C. Wyman continued with his investigation during the year, though he took occasion to deplore the decision of the U.S. supreme court which ruled that state sedition laws had been superseded by federal legislation.

State officers in 1956 were: governor, Lane Dwinell, elected in Nov. 1954 and re-elected in 1956; secretary of state, Enoch D. Fuller; state treasurer, Alfred S. Cloues; adjutant general, Col. John Jacobson, Jr., succeeded on Oct. 1 by Col. Francis B. McSwiney; commissioner of education, Austin J. McCaffrey; commissioner of agriculture, Perley I. Fitts.

Education.—In 1953-54 there were an estimated 82,711 pupils enrolled in 546 public schools in the state, of which 63,459 were from kindergarten through eighth grade and 19,252 in grades 9 through 12. There were 39 rural schools, 414 elementary schools, 11 approved junior high schools, 61 senior high schools and 21 junior-senior high schools. There were 3,365 teachers, including 2,088 elementary and 1,277 high school teachers. Total payments covering expenditures of school districts for the year 1953-54 were \$23,257,931. District receipts for 1953-54 included \$732,879 from federal aid, \$956,303 from state aid, \$18,506,749 from local taxation and \$3,815,340 from other sources. In 1949-50 Catholic parochial elementary schools had a total registration of 19,306, while other private elementary schools had a registration of 683. The total number of students enrolled in approved public academies, accredited secondary schools and other private secondary schools in the same year was 6,440. As of Aug. 1956 New Hampshire schools were reported facing the most acute shortage of teachers in their history, inadequate salaries being at the heart of the problem.

Other state educational institutions were the University of New Hampshire at Durham; Keene Teachers college at Keene; and Plymouth Teachers college at Plymouth.

Social Insurance and Assistance, Public Welfare and Related Programs.—As of Aug. 1956 the numbers and categories of cases receiving direct relief and public assistance under the Social Security act were as follows: direct relief, 2,056 cases with expenditures of \$107,209; old-age assistance (including aliens) for the month, 5,822, with expenditures of \$381,536; aid to dependent children, 916 families representing 2,536 children, with expenditures of \$124,684; aid to needy blind, 260 cases, with expenditures of \$18,416; aid to permanently and totally disabled, 294 cases, with expenditures of \$26,845. Total expenditures for public assistance and total obligations for direct relief were \$658,690 for Aug. 1956, compared with \$674,974 for Aug. 1955 and \$766,806 for April 1956. In the fiscal year 1955 New Hampshire received \$3,455,000 in federal grants for public assistance, while in the same year payments by the state to recipients of public assistance amounted to \$7,210,000. The sum of \$6,546,000 was collected in contributions for unemployment insurance in 1955, and \$5,235,000 was paid in benefits. Funds available for benefits as of Dec. 1955 amounted to \$21,831,000.

The net appropriation for the operation of the state prison at Concord for the fiscal year ending June 30, 1956, was \$321,743; and for the Industrial School for Committed Minors at Manchester, \$318,190. As of Dec. 31, 1954, there were 169 persons in New Hampshire prisons and reformatories.

Communications.—At the end of 1954 there were 12,386 mi. of rural roads in New Hampshire, including highways under state, local and federal control. Disbursements from state highway funds for 1954 amounted to \$25,459,000. In 1954 there were 870 mi. of railways in the state compared with 936 in 1950. At the close of 1954 there were approximately 42,000 business and 116,000 residential telephones in operation.

Banking and Finance.—As of Dec. 31, 1955, there were in New Hampshire 52 national banks with deposits of \$243,476,000 and assets of \$270,894,000, compared with 52 banks with deposits and assets respectively on Oct. 7, 1954, of \$223,598,000 and \$249,503,000. Fifty-eight state-chartered banks had on June 30, 1956, deposits of \$462,984,222 (not including commercial deposits, Christmas clubs and school savings) and assets of \$559,285,541, compared with 58 institutions reporting deposits and assets, respectively, of \$452,041,126 and \$547,155,782 on June 30, 1955. There were 21 state-chartered building and loan associations with assets of \$47,124,921 compared with 21 institutions with assets of \$41,072,626 for the year 1955. Two federal savings and loan associations re-

orted combined assets of \$51,467,235 as of June 30, 1956. On June 30, 1956, deposits in savings institutions were \$489,652,846, an increase of \$7,611,720 or 8.3% over the previous year.

Cash receipts of the state treasury department for the fiscal year ending June 30, 1956, were \$115,904,356; cash disbursements \$111,972,491. Cash balance on June 30, 1956, was \$12,386,689, as compared with a cash balance on June 30, 1955, of \$8,454,825. The bonded indebtedness on June 30, 1956, was \$53,912,000.

Agriculture.—The estimated acreage from which crops were harvested in 1954 was 246,583 as compared with 290,199 in 1949. Cash receipts

Table I.—Principal Crops of New Hampshire

Crop	Indicated 1956	1955	Average, 1945-54
corn, bu.	400,000	528,000	540,000
oats, bu.	37,000	34,000	141,000
rye, tons	276,000	341,000	392,000
potatoes, cwt.	414,000	416,000	567,000
apples, bu.	830,000	1,540,000	890,000
apple syrup, gal.	54,000	57,000	53,000
apple sugar, lb.	4,000	3,000	13,000

Source: U.S. Department of Agriculture.

1955 from farm marketings (including crops and livestock and live-stock products) were \$69,400,000 as compared with \$66,800,000 in 1954. Government payments in 1955 were an estimated \$500,000 as compared with \$200,000 in 1954.

Manufacturing.—There were an estimated 1,075 manufacturing establishments in New Hampshire as of Sept. 1950. In 1953 the average number of all employees was 88,771, to whom wages and salaries amounting to \$72,833,000 were paid. The estimated value added by manufactures in the

Table II.—Principal Industries of New Hampshire

	All employees 1954	Salaries and wages 1954 (in 000s)	Value added by manu- facture 1954 (in 000s)	Value added by manu- facture 1953 (in 000s)
Food and kindred products	2,816	\$ 9,267	\$17,478	*
Textile mill products	12,670	40,293	62,635	\$84,536
Paper and allied products	5,921	23,487	44,279	48,897
Printing and publishing industries	3,139	11,866	19,115	*
Leather and leather products	21,115	58,132	86,581	84,283
Instruments and related products	238	781	1,149	...

* Withheld because the estimate did not meet publication standards, either on the basis of the associated standard error of estimate or on the basis of a consistency review.

Source: U.S. Department of Commerce, 1954 Census of Manufactures, preliminary report.

time year was \$427,126,000. The principal categories of manufactures are textiles, lumber products, paper, leather and leather goods and machinery. There continued to be an attitude of concern in regard to the future of the textile industries in the state. In March 1956 there were an estimated 176,230 persons employed in nonagricultural labour compared with 173,560 in March 1955. (W. E. Ss.)

Mineral Production.—New Hampshire produces only three minerals whose value annually exceeds \$100,000. These are shown for 1953 and 1954 in Table III. In 1954 New Hampshire was second among the states in field-

Table III.—Mineral Production of New Hampshire

		1953		1954	
Mineral	Quantity	Value	Quantity	Value	
Total		\$1,805,000		\$2,112,000	
Mica, sheet-pounds	90,716	383,000	42,466	234,000	
Gold and gravel	2,249,000	506,000	2,241,000	1,094,000	
Other minerals	77,000	539,000	73,000	473,000	
	...	377,000	...	311,000	

Source: U.S. Bureau of Mines.

output, third in mica sold or used and stood 46th in the value of mineral output, with 0.02% of the U.S. total.

ENCYCLOPÆDIA BRITANNICA FILMS.—*New Hampshire* (1955); *North-eastern States*, 2nd. ed. (1955).

New Hebrides. This Anglo-French condominium, the British element of which is within the jurisdiction of the western Pacific high commissioner (see PACIFIC ISLANDS, BRITISH), consists of a group of about 30 islands and many islets, about 500 mi. W. of Fiji. Area: 5,700 sq.mi. Pop. (1955 est.): native 48,800, mainly Melanesians; non-native 120, including 501 British or under British jurisdiction and 519 French or under French jurisdiction. Religion: mainly Roman. Capital, Vila (pop., est. 4,000), on Efate Island. Resident commissioners in 1956: British, J. S. Rennie; French, Pierre Anthonioz.

History.—During 1956 the fisheries research vessel of the Institut Français de l'Océanie carried out research into plankton and fish species to assess the possibilities of economic development. Japanese interests investigated tuna fishing prospects. The 10th anniversary of the establishment of the Anglo-French condominium was celebrated in October by the visit of a French

cruiser and the opening of a cultural centre at Vila.

(D. W. F.)

Education.—Schools (1954): British government and aided 2; French government and aided 5; several British mission schools; French mission 2; secondary (mission) 1, pupils 25; pupils (all schools, 1952) 5,464. Teachers in training (British, 1952) 204.

Finance and Trade.—Currency: Australian pound and New Hebridean franc (£A1.25=£1 sterling=U.S. \$2.80; £1=178 fr. N.H.; U.S. \$1=63.6 fr. N.H.; £A1=142.40 fr. N.H.). Condominium budget (1955 est.): revenue £278,000; expenditure £302,000. British administration budget (1954-55 revised est.): revenue £A9,698; expenditure £A71,625. French administration budget (1954 actual): revenue 27,667,000 fr. N.H.; expenditure 27,667,000 fr. N.H.

Foreign Trade.—(1954) Imports £1,143,841, including £672,242 from Australia, £151,041 from France, £189,078 from the U.K. Exports £1,660,558, including £1,574,840 to France, £67,477 to Australia (copra 543 tons; cocoa 735 tons; coffee 162 tons; trochus shell 98 tons).

New Jersey. New Jersey, the "Garden state," is one of the northeastern states of the United States bordering the Atlantic ocean. It was the third state to enter the union, approving the constitution on Dec. 18, 1787. It has an area of 7,836 sq.mi. of which 314 sq.mi. are inland water. The population in 1950 was 4,835,329, of which 86.6% was urban and 94.3% was white. Official provisional estimates placed the July 1, 1956, population at 5,403,000. The capital is Trenton, which had a population of 128,009 in 1950. Other large cities were Newark 438,776; Jersey City 299,017; Paterson 139,336; Camden 124,555; and Elizabeth 112,817.

History.—Some of the more important measures approved by the legislature and the governor in 1956 were a measure designated the "Rutgers, the State University Act of 1956," which authorized and implemented a specified plan for the reorganization of the administration of Rutgers university and clarified the relation between the state and university; a measure authorizing and directing the Commissioner of Conservation and Economic Development to acquire such part of Round valley, Hunterdon county, as was necessary for the future establishment of a water supply system, the source of which should be solely from the Delaware river, and appropriating \$3,000,000 out of excess funds in the Veterans Loan Guaranty and Insurance fund for the above purpose; a measure which increased the rate of tax on the sole use of cigarettes within the state from 3 cents to 5 cents per package for financing local school construction; a measure designated the school building aid act, which established for each school district for the school year 1956-57 and each school year thereafter a capital foundation program, a local share and an annual building aid allowance and designated \$12,000,000 for appropriation during the 1956-57 fiscal year; a measure authorizing the Port of New York authority to construct a bridge across the Narrows between Staten Island and Long Island; a measure increasing generally the weekly payments accruing to employees under the Workmen's Compensation law; a measure requiring the boards of trustees of public libraries serving more than 10,000 population to employ in professional library positions only persons holding state certificates.

In the general election held Nov. 6, 1956, Pres. Dwight D. Eisenhower received about 1,600,000 as compared with about 850,000 votes for Adlai E. Stevenson. New Jersey's delegation to the U.S. house of representatives would consist of 10 Republicans and 4 Democrats.

Two proposed amendments to the state constitution, an increase in the term of office of county sheriff from three to five years, and permitting the legislature to authorize municipalities to establish a proportion of the standard of value for the assessment of real property, were defeated.

The chief officers during 1956 were Robert B. Meyner, governor; Edward J. Patten, secretary of state; Grover C. Richmond, Jr., attorney general; Archibald S. Alexander, state treasurer; Charles R. Howell, commissioner of banking and insurance; Joseph E. McLean, commissioner of conservation and

economic development; and Arthur T. Vanderbilt, chief justice.

Education.—Public day school enrolment totalled 656,934 for kindergarten through eighth grade in June 1956; enrolment for grades 9 to 12 (including grades 7 and 8, junior high schools) was 226,047, and for special classes 9,683. The 4 universities, 10 liberal arts colleges, 8 professional and technical colleges and 10 junior colleges had a combined enrolment of 25,356 full-time and 21,623 part-time students in 1956. The 6 state teachers colleges had a total enrolment (full- and part-time students in 1956) of 8,898, while the 27 professional and technical institutes had 1,061 full-time and 1,083 part-time students in 1956. The public day school expenditures (excluding capital expenditures) for fiscal 1954-55 were \$255,870,957. The commissioner of education was Frederick M. Raubinger.

Social Insurance and Assistance, Public Welfare and Related Programs.—In June 1956 the state's welfare system cared for 14,495 patients in institutions for the mentally ill, while the county hospitals cared for an additional 6,612. The state institutions for the mentally deficient contained 5,246 patients; tuberculosis sanatoriums had 2,135 patients; 675 students were in training schools for juvenile delinquents and 213 veterans were in soldiers' homes. Old-age recipients numbered 19,639 in July 1956. The number of children assisted by the board of child welfare totalled 24,010; 939 received blind assistance and the number of general assistance recipients was 16,818. The state prison, three prison farms and three reformatories for adult offenders contained 3,904 inmates. Benefit payments to jobless totalled \$7,876,941 during July, 1956.

Communications.—The total highway mileage of New Jersey on Jan. 1, 1954, was 28,987, of which 6,000 mi. were unimproved. State and federal funds disbursed for roads totalled \$67,558,028 during the fiscal year 1955-56. Motor vehicle registrations totalled 2,096,152 in 1955. The 23 railroads operating within the state had a track mileage of 5,317.90 and a line mileage of 1,970.85 on Dec. 31, 1954. Civil, commercial and municipal airports numbered 68 as of July 1, 1956.

Banking and Finance.—Deposits of the 129 institutions under the supervision of the state department of banking and insurance amounted to \$3,686,276,000 on June 30, 1956, an increase of \$168,028,000 over the previous June 30. The deposits of 106 commercial institutions were \$2,634,100,000, an increase of 3.7%, while the deposits in 23 saving banks showed \$1,052,176,000, an increase of 7.6%. The number of national banks in New Jersey numbered 188 on Dec. 31, 1955, with total assets of \$3,439,085,000. The 448 building and loan and savings and loan associations had assets of \$1,384,418,286 on Dec. 31, 1955. State general treasury fund receipts for fiscal 1955-56 were \$475,002,931 and disbursements totalled \$497,679,080; the state's bonded debt was \$105,270,000 as of June 30, 1956.

Agriculture.—Combined harvested acreage of all New Jersey crops in 1955 was 815,000 ac. Cash income from crops amounted to \$95,941,000, from livestock \$222,877,000 and from government payments \$655,000. Total value for staple crops amounted to \$42,547,000; the value of commercial vegetable crops (excluding potatoes but including strawberries) totalled \$39,836,000; the value of fruit crops totalled \$13,558,000.

Table I.—Principal Crops of New Jersey

	Indicated 1956	1955	Average, 1945-54
Corn, bu.	11,368,000	5,454,000	9,114,000
Wheat, bu.	1,425,000	1,556,000	1,799,000
Hay, tons	549,000	464,000	456,000
Potatoes, Irish, cwt.	3,528,000	3,718,000	4,481,000
Potatoes, sweet, cwt.	1,282,000	1,394,000	1,361,000
Asparagus, all purposes, 30-lb. crates	2,254,000	2,593,000	..
Tomatoes for fresh market, bu.	1,533,000	1,256,000	..
Tomatoes for processing, tons	259,400	100,800	..
Apples, bu.	3,000,000	3,000,000	2,433,000
Peaches, bu.	1,600,000	1,700,000	1,625,000

Source: U.S. Department of Agriculture.

Manufacturing.—Wages paid to manufacturing workers in 1955 totalled \$3,635,671,730; for the first quarter of 1956 they amounted to \$949,002,801. The number of manufacturing workers averaged 814,876 during the first quarter of 1956. (R. H. M.)

Table II.—Principal Industries of New Jersey

	All employees 1954	Salaries and wages 1954 (in 000s)	Value added by manu- facture 1954 (in 000s)	Value added by manu- facture 1953 (in 000s)
Food and kindred products	61,134	\$260,214	\$646,078	\$563,304
Tobacco manufactures	3,856	10,590	32,994	41,334
Textile mill products	44,761	172,698	273,057	336,094
Apparel and related products	78,115	214,360	325,505	359,564
Lumber and products (except furniture)	5,196	17,853	28,278	*
Furniture and fixtures	8,558	32,764	56,322	*
Printing and publishing industries	24,873	113,545	177,081	172,805
Chemicals and allied products	81,661	399,783	1,090,959	1,130,249
Petroleum and coal products	17,235	92,629	149,407	176,240
Rubber products	13,693	56,909	93,609	97,853
Stone, clay, glass products	31,149	125,646	225,541	216,514
Primary metal industries	36,122	164,063	287,136	326,679
Fabricated metal products	52,306	231,321	427,158	414,783
Machinery (except electrical)	67,742	320,123	521,984	530,115
Electrical machinery	100,600	432,203	749,202	757,558
Transportation equipment	56,742	273,425	497,027	502,692
Instruments and related products	24,708	118,553	180,232	189,471
Miscellaneous manufactures	39,245	149,323	242,467	300,984

* Withheld because the estimate did not meet publication standards, either on the basis of the associated standard error of estimate or on the basis of a consistency review. Source: U.S. Department of Commerce, *Annual Survey of Manufactures*, 1954.

Mineral Production.—Table III shows the tonnage and value of those minerals produced in New Jersey in 1953 and 1954 whose value exceeded \$100,000. In 1954 New Jersey was second among the states in selenium output; supplied an important part of muscovite and film mica produced;

Table III.—Mineral Production of New Jersey

Mineral	Quantity (in short tons)	1953		1954	
		Quantity	Value	Quantity	Value
Total			\$51,945,000		\$47,044,000
Clay	532,000		1,326,000	578,000	1,246,000
Coke*	1,175,000		?	930,000	?
Iron ore	914,000		10,115,000	533,000	6,622,000
Manganiferous residuum	294,000		?	215,000	?
Marl (greensand)	7,000		193,000	2,000	185,000
Peat	22,000		?	?	?
Sand and gravel	7,362,000		10,836,000	10,005,000	14,704,000
Sandstone, ground	128,000		919,000		
Stone	6,036,000		13,308,000	5,772,000	12,110,000
Zinc	46,000		9,923,000	37,000	7,992,000
Other minerals . . . . .	...		5,325,000	...	4,185,000

*Values for processed materials are not included in the totals.
†Value included with other minerals.

Source: U.S. Bureau of Mines.

and was fifth in asphalt sales. It ranked 34th in the value of its mineral output with 0.34% of the U.S. total.

ENCYCLOPEDIA BRITANNICA FILMS.—*Northeastern States*, 2nd ed. (1955).

New Mexico. A state in southwestern United States, popularly known as the "Sunshine state." New Mexico was admitted to the union in 1912. Area: 121,666 sq.mi. (121,511 sq.mi. land, 155 sq.mi. water); pop.: (July 1, 1956, provisional est.) 815,000; (1950 census) 681,187, including rural 339,298; urban 341,889; white 630,211; nonwhite 50,976. Capital: Santa Fe (1950 pop.) 27,998. Other cities: Albuquerque 96,815; Roswell 25,738; Carlsbad 17,975; Clovis 17,318; Hobbs 13,875; Las Cruces 12,325.

History.—The state elective administration, legislature and congressional representation were Democratic during 1956. The chief officers of the state were: governor, John F. Simms, Jr.; lieutenant governor, Joseph M. Montoya; secretary of state, Natalie Smith Buck; auditor, J. D. Hannah; treasurer, Joseph B. Grant; attorney general, Richard H. Robinson; superintendent of public instruction, Mrs. Georgia L. Lusk.

In the Nov. 1956 elections, the Republican candidate, Edwin L. Mechem, was elected governor for the two-year term 1957-58. Otherwise the state administration remained Democratic, as above, except that Fred M. Stanley became attorney general in place of Richard H. Robinson. The state legislature would have a Democratic majority for the next two years.

The representation in the U.S. congress also remained Democratic. However, Congressman Antonio M. Fernandez died on Nov. 7, 1956.

In the presidential voting, more than 146,000 ballots were cast in New Mexico for Pres. Dwight D. Eisenhower as against about 106,000 for Adlai E. Stevenson.

Education.—For the school year 1954-55, 5,578 teachers served in municipal schools at an average salary of \$4,221.50; pupils numbered 155,370. In rural schools 1,044 teachers earned an average salary of \$3,962; pupils numbered 24,416. Total expenditures for municipal and rural schools were \$43,928,807.91.

Social Insurance and Assistance, Public Welfare and Related Programs.—During the fiscal year ending June 30, 1956, \$4,580,350.50 was expended for old-age assistance; \$5,154,008.50 for dependent children; \$182,236 for needy blind; \$749,686.50 for the disabled; \$114,852.77 for general assistance; \$890,853.69 for medical care; \$272,982.91 for child welfare services; \$176,092.11 for crippled children; and \$41,114.98 for services to the blind. A total of \$2,864,127 was paid for unemployment compensation; \$507,348 for veterans' unemployment compensation and \$211,012 for federal employees. For the same fiscal year, an estimated \$11,621,000 was paid for old-age and survivors' insurance.

The penitentiary appropriation was \$1,020,564 for 768 inmates; state hospital, \$1,375,000 for 975 patients; Los Lunas mental hospital, \$143,610 for 153 inmates; girls' welfare home, \$248,000 for 160 inmates; industrial school for boys, \$261,134 for 121 inmates (all as of Sept. 1).

Communications.—New Mexico had an estimated 55,096.6 mi. of "unpaved" highways and 7,739 mi. of "paved" as of Jan. 1, 1956. For the fiscal year ending June 30, 1956, the state highway department expended \$31,122,625.17. Steam railway companies operated 2,536 mi. of main track (1954). There were 3 scheduled air carriers, 97 airports and airfields (June 1); 1,490 mi. of controlled coloured airways and 2,555 mi. of very-high-frequency omnidirectional range airways. There were about 192,000 telephones.

Banking and Finance.—On Dec. 31, 1955, there were 26 national banks with total deposits of \$374,834,370.09; loans \$135,341,241.93; investments \$149,014,146.58. The 26 state banks had deposits of \$146,071,821.99; loans \$55,676,301.09; investments \$61,695,606.48.

Total resources of 14 building and loan associations in 1955 were \$30,885,780.44 and of 7 federal savings and loan associations, \$57,402,461.51; 100 small loan licensees had total loans outstanding of \$15,594,356.

Table I.—Principal Crops of New Mexico

Crop	Indicated 1956	1955	Average, 1945-54
Wheat, bu.	918,000	1,092,000	1,272,000
Feed, bu.	1,095,000	1,770,000	2,896,000
Alfalfa, bu.	252,000	351,000	654,000
Cotton, bu.	660,000	800,000	567,000
Grain, bu.	2,360,000	5,550,000	3,609,000
Beans, bu.	590,000	620,000	586,000
Peas, dry (100-lb. bags)	160,000	167,000	264,000
Peas, green, tons	5,800	7,400	4,430
Apples, tons	531,000	548,000	442,000
Potatoes, cwt.	202,000	89,000	87,000
Nuts, lb.	6,000,000	6,180,000	7,699,000
Oranges, lb.	3,500,000	3,460,000	2,485,000

Source: U.S. Department of Agriculture.

Table II.—Mineral Production of New Mexico

(in short tons, except as noted)

Mineral	Quantity 1953	Value 1953	Quantity 1954	Value 1954
Total		\$330,797,000		\$373,695,000
Coal	514,000	3,081,000	123,000	727,000
Copper	72,000	41,602,000	61,000	35,729,000
Silver	12,000	9,000	9,000	9,000
Gold (oz.)	3,000	91,000	4,000	124,000
Uranium (cu. ft.)	11,158,000	150,000	41,755,000	735,000
Lead	3,000	771,000	1,000	243,000
Vanadium	21,000	82,000	21,000	82,000
Oil shale (000 cu. ft.)	399,086,000	24,344,000	449,346,000	35,049,000
Natural gasoline (000 gal.)	172,000	10,094,000	224,000	11,744,000
Crude oil	85,000	662,000	111,000	886,000
Petroleum (bbl.)	70,441,000	185,260,000	74,820,000	205,760,000
Petroleum gases (000 gal.)	121,000	4,618,000	226,000	5,704,000
Potassium salts (K ₂ O equiv.)	1,553,000	52,293,000	1,732,000	64,367,000
Sulfur	529,000	760,000	364,000	1,060,000
Salt	62,000	216,000	51,000	333,000
Clay and gravel	1,416,000	1,239,000	6,519,000	8,340,000
Brick (oz.)	205,000	186,000	109,000	99,000
Iron	625,000	511,000	772,000	714,000
Other minerals	13,000	3,076,000	6	1,000
Total	...	1,843,000	...	1,998,000

(Value included with other minerals.)

Source: U.S. Bureau of Mines.

The total of all state receipts for the fiscal year ended June 30, 1956, was \$133,050,513.51; total disbursements \$119,151,804.48. The total undebted was \$30,168,000.

Agriculture.—The total value of agricultural production in 1955 was estimated at \$87,432,000; acreage harvested 1,441,000. Livestock was estimated at \$109,069,000 (Jan. 1, 1956).

Manufacturing.—Estimates on manufacturing for 1955 were: hired work-17,630 (monthly average); wages \$81,300,000; sales \$260,000,000. (F. D. R.)

Mineral Production.—New Mexico mines a variety of metals and minerals. Table II shows the tonnage and value of those produced in 1953 and 1954. The value exceeded \$100,000. In 1954 New Mexico was the principal producer of beryllium, was first among the states in output of potash with 1/3 of the U.S. total, second in output of columbium-tantalum and pumice, fourth in copper and fifth in natural gas; and ranked ninth in the value of its mineral output, with 2.68% of the U.S. total.

ENCYCLOPEDIA BRITANNICA FILMS.—*New Mexico* (1955); *Southwestern States*, 2nd ed. (1954).

Newspapers and Magazines. U.S. Newspapers.—

The story of the year 1956 for U.S. newspapers. Few dailies had much as a month's supply at any time, and rationing of advertising became a common practice, even during the Christmas rush of 1955. Consumption of newsprint reached an all-time high, estimated at 6,800,000 tons during 1956, at a cost of \$27,000,000 more than in any previous year. Late in 1956 the situation improved somewhat with production up 6.7% and consumption up only 3.7% over 1955. During Dec. 1955 newsprint prices were raised \$3 to \$5 a ton, with various mills charging \$130 to \$132 a ton. To seek a solution of the newsprint problem, 387 newspapers and several manufacturers contributed \$40,000 to finance a survey conducted by Inland Daily Press association and the University of Wisconsin, Madison.

The paper shortage resulted mainly from the larger editions pressed by the great increase in advertising, which continued to break all records. Media Records gave the totals for 1955 as 43,394,974 lines of advertising, 10.2% more than in 1954; total income from advertising totalled \$695,000,000, an increase of \$100,000,000 or 17% above 1954. Totals continued to rise in 1956, with some drop during spring and summer months because of a 20% decline in automobile advertising. The increase during the first six months averaged 4.5% above 1955. At least 487 newspapers had increased their advertising rates an average of 11.4% in Aug. 1956. A survey of liquor advertising showed that,



"MEET THE PRESS," a 1956 cartoon by Fischetti of NEA Service, Inc.

although 217 newspapers were "totally dry" and 142 others carried only beer advertising, liquor advertising brought \$41,055,000 a year to the newspapers that carried it. Because of use of narrower paper rolls to save newsprint, page makeup had become so chaotic in 1956 that advertising agencies clamoured for a standard-width column.

Paper shortage also resulted from record-breaking newspaper circulation. *Editor and Publisher* summed up 1955 by announcing that the 1,760 English-language daily newspapers were circulating 56,147,359 copies a day, an increase of 1,074,879 copies or 1.9% above 1954; morning newspapers led with a 2.2% increase. The totals continued to rise during 1956, reaching a daily increase of 1.51% by April. Copy prices were universally increased, averaging 5 cents in most cases and reaching 20 cents a copy for Sunday papers even in the smaller cities. But, although newspaper income increased greatly, costs rose so much faster that profits were down. One survey showed an average 50,000-copy daily making a profit of only 4.75% and larger newspapers made less.

The year 1956 was rather quiet on the labour front. The most important strike was in Detroit, Mich., where the three daily newspapers, *News*, *Free Press* and *Times*, were suspended for 47 days, from Dec. 1, 1955, to Jan. 16, 1956; the strike was started by 116 stereotypers but was continued by 5,000 union printers as a jurisdictional fight, not for wages, but for contract fringe benefits. In Aug. 1956 union printers struck two newspapers, the *Grand Junction Sentinel* (Colo.) and the *Dover State News* (Del.) for short periods. Printers of the *Brooklyn Eagle* (N.Y.), whose strike from January 28 to March 17, 1955, was responsible for the suspension of the newspaper, petitioned in 1956 for suspension pay but were refused. A survey by Inland Daily Press showed that newspaper wages had gone up 41% since 1948.

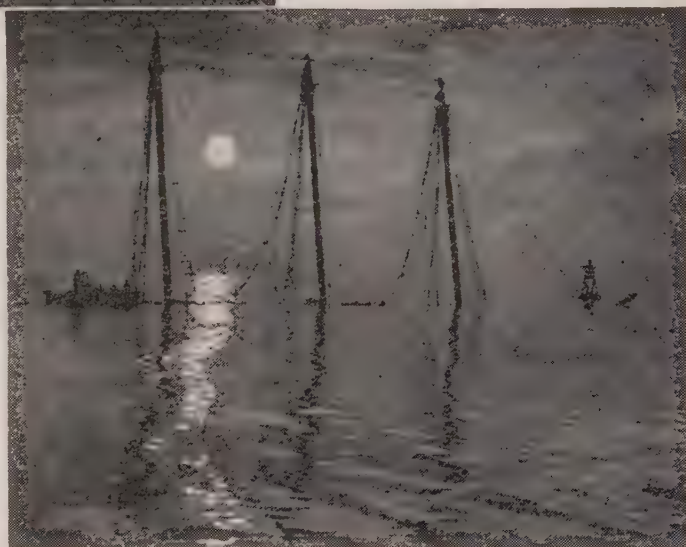
The largest newspaper sale was the purchase in Dec. 1955 of the *Birmingham News* (Ala.), the *Huntsville Times* (Ala.), three radio stations and one television station for \$18,700,000 by Samuel I. Newhouse, who owned 13 other newspapers in nine cities. The Stauffer Publications Inc., which owned the *Topeka State Journal* (Kan.), 10 other dailies and three radio stations, purchased in Sept. 1956 for more than \$7,000,000 the Capper Publications, which included the *Topeka Daily Capital* (Kan.), the *Kansas City Kansan* (Kan.), two magazines, five state farm



Above: First prize FEATURE category, magazines, "Venus and the Law," by Grey Villet, *Life* magazine, selected as MAGAZINE PHOTOGRAPHER OF THE YEAR



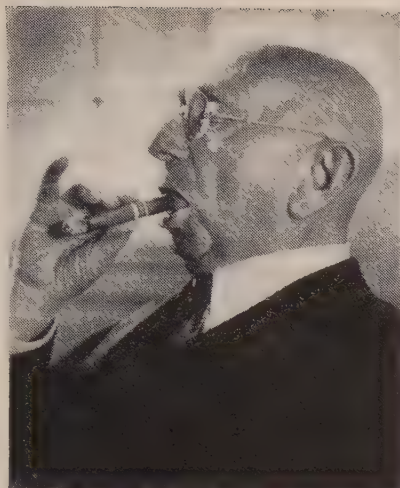
Above: "Springtime," by Bob Williams, *Memphis Commercial Appeal* (Tenn.), first prize FEATURE category, newspapers



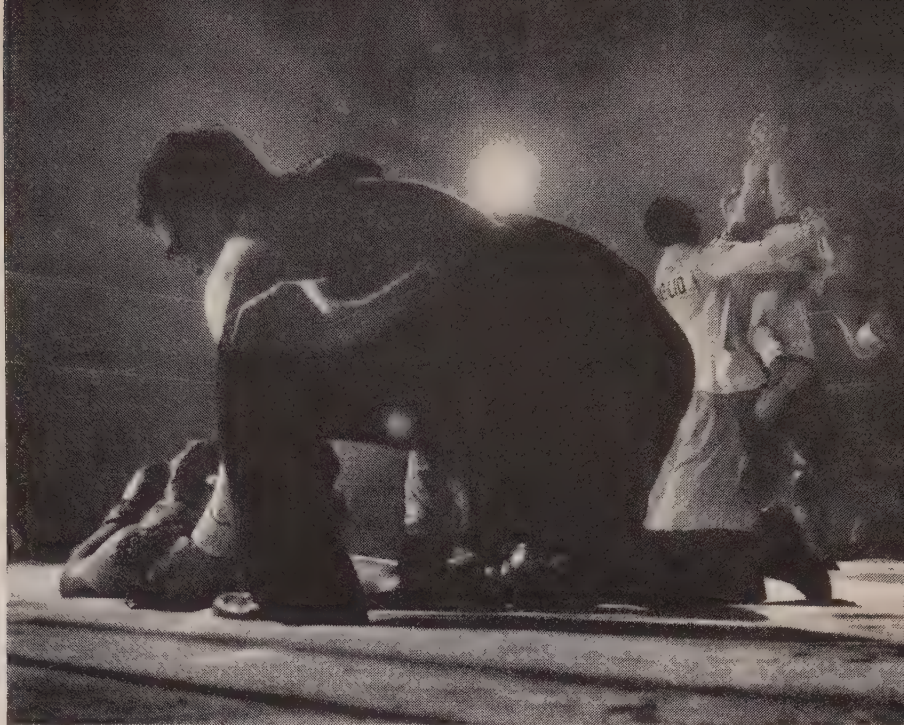
Right: "Final Run," by A. Aubrey Bodine, the *Sunpapers* (Baltimore, Md.), first prize PICTORIAL category

Below: "Grief," by Carl D. Nowicki, *Milwaukee Journal* (Wis.), two of a series voted first prize NEWSPAPER PICTURE STORY, shows the tearful collapse of a mother as rescuers seek futilely for the body of her child





Above: "Max Hirschfeld—100th Birthday," by Richard Stacks, the *Sunpapers* (Baltimore, Md.), first prize PERSONALITIES category



Above: "Fighter of the Year," first prize SPORTS, by Hy Peskin, *Sports Illustrated*, shows Carmen Basilio jumping joyfully after knocking out Tony DeMarco to retain the world welterweight title

NEWS PICTURES OF THE YEAR

Prize-winning photographs chosen in the thirteenth annual competition and exhibition for press photographers of America, sponsored jointly in 1956 by the National Press Photographers association and *Encyclopædia Britannica*

Below: "Grateful Receiver (Tampico, Mexico Flood)," by Robert Kelley, *Life* magazine, first prize in GENERAL NEWS category



Above: Lt. Robert J. Kennedy of the Philadelphia, Pa., fire department was voted first prize in SPOT NEWS category for "Cheating Death"



papers, *Copper's Weekly*, two radio stations and one television station. The Ridder Publications, Inc., which owned 12 other newspapers, purchased in March 1956 the *Pasadena Star-News* (Calif.) and the *Pasadena Independent* for more than \$4,000,000. The E. W. Scripps company on April 26, 1956, bought for \$4,059,000 the *Cincinnati Enquirer* (O.), which had been conducted as employee-owned for three years but developed internal conflict. Arthur H. Sulzberger, publisher of the *New York Times*, took over in Nov. 1955 the *Chattanooga Times* (Tenn.). The 125-year-old *Boston Post* (Mass.) fell into financial difficulties and was suspended Aug. 16, 1956, was refinanced and revived on Aug. 25, and suspended again in October. The 50-year-old Negro weekly newspaper, the *Chicago Defender* (Ill.), became a tabloid daily on Feb. 6, the second Negro daily in the country. The *Brooklyn Eagle*, which had been suspended on March 17, 1955, was bought and revived as a tabloid daily in Jan. 1956 by Robert W. Farrell. The *New York Herald Tribune* on Sept. 9, 1956, launched a new Sunday magazine supplement, *Today's Living*.

Extensive new newspaper plants were started during the year. The *Chicago Sun-Times* (Ill.) broke ground for a \$15,000,000 plant. The *Boston Globe* (Mass.) began a \$12,000,000 building. The *Miami News* (Fla.) started a \$5,000,000 plant. The *Gary Post-Tribune* (Ind.) announced a \$3,000,000 building project. The *New York Times* announced plans for a new \$40,000,000 plant. The *Cleveland Plain Dealer* (O.) on Aug. 18 moved all its machinery in a week-end operation into the expanded plant of the *Cleveland News*. The new plant of the *Philadelphia Bulletin* (Pa.) was seriously damaged on March 28, 1956, by the explosion of a granary across the street.

As 1956 was a presidential election year, political campaign material bulked large. Newspapers and press services sent large staffs which filed 10,000,000 words from the Democratic convention in Chicago, Ill., Aug. 13 and 7,100,000 words from the Republican convention in San Francisco, Calif., Aug. 20, 1956.

The American Association of Advertising Agencies and the American Newspaper Publishers association in April 1956 obtained a consent decree ending the antitrust suit brought against them in 1955. The office of the Communist *New York Daily Worker* was seized by internal revenue officers in March for back income taxes totalling \$46,070, but the matter was settled by payment in June. As a result of an investigation by the senate (Eastland) security committee into a "Communitistic ring" in New York newspaper staffs in recent years, six news workers were discharged by three newspapers in Jan. 1956. A newspaper protest resulted in June from a news "scoop" (an antitrust suit against General Motors) that was given to the public by U.S. Attorney General Herbert Brownell in a television program.

Victor Riesel (*q.v.*), labour columnist attacking labour racketeers, was blinded by acid thrown in his face in a New York street on April 5, 1956, but continued his campaign. The U.S. state department in August refused visas to United States newspapermen who wished to visit Red China. A reporter of the *Chicago Daily News* (George Thiem) unearthed in July the story of the more than \$1,000,000 defalcation by Orville E. Hodge, state auditor of Illinois.

Magazines.—Among U.S. magazines, the year 1956 broke many records. Advertising pages and revenue were up 9% to 15% over 1955; the grand total was 3,342 pages or \$650,000,000 in 100 magazines, about \$56,000,000 over any previous year, in spite of a drop in automobile advertising. Advertising rates were raised materially, but profits were low, averaging 2.8% in 35 leading magazines because of high paper costs, which rose 5% to 17% to well over \$200 a ton. The Audit Bureau of Circulations gave its first audited magazine report, in which *Reader's Digest* led with 11,900,000 domestic sales plus 8,000,000 in 28

foreign editions; *Life* was next with 5,655,000; *Saturday Evening Post* had 4,638,000; *Look*, 4,076,000; *Collier's*, 3,372,000; *Ladies Home Journal*, 4,817,000; *Better Homes and Gardens*, 4,133,042. The total of all Audit Bureau of Circulations magazines was 166,000,000, up 26% in the last eight years.

Magazine publishers not only stopped worrying about television competition, but many bought television and radio stations to "diversify." Much change in newsstand sales resulted from an antitrust battle between Union News and the parent American News company, resulting in at least 17 magazines leaving Union News and setting up a new distributing organization, Select Magazines, Inc., which included *Life*, *Look*, *Time* and *Sports Illustrated*. Meanwhile, a new wave of magazine selling through 25,000 supermarkets and 35,000 drug stores involved new devices for store display and relieved magazines from competition with comics and pocket books. *Town Journal* led in sales in 5,000 stores; *Family Circle* and *Woman's Day* sold 4,000,000 each in chain stores; *Coronet* sold 400,000 in supermarkets. Canada in August put a 20% tax on "Canadian editions" of American magazines published outside Canada. A rash of about 40 "off-colour" and "borderline" men's magazines—including *Nuggett*, *Modern Man*, *Playboy*, *Rogue* and *Cabaret*—aroused a vigorous campaign of censorship by legislative groups, women's clubs and church, educational and other groups. *Confidential*, leader among the exposé keyhole magazines, selling 3,600,000 copies, was barred from the mail at least once during 1956. It launched a British edition. The U.S. supreme court annulled a ban on two nudist magazines—*Sunshine and Health* and *Solaire Universelle Nudism*.

The 50-year-old *Blue Book* and the 80-year-old *American Magazine* were suspended in 1956; Curtis' *Bride-to-Be* was suspended after three issues; and in December, Crowell-Collier Publishing company announced the discontinuance of *Collier's* and *Woman's Home Companion*, each with circulation of more than 4,000,000, because of insufficient advertising revenues. *House and Home* in April 1956 published the largest issue on record—414 pages. In October a new quarterly, *Fashion*, was launched. (G. M. Hy.)

Canada.—Counting morning and evening papers as one, Canadian daily newspapers numbered 95 in 1956, with circulation reported by the Canadian Daily Newspaper Publishers association as 3,912,478. Membership in the Canadian Press was 97, highest since 1932. D. B. Rogers, editor of the *Regina Leader-Post*, was elected president for two years. The Canadian wire-photo network, made permanent Feb. 1, 1956, served 14 members in eight eastern cities day and night.

National newspaper awards in 1956 were as follows: editorial writing, C. M. Fellman, *North Bay Nugget*; spot news reporting, Dick Snell, *Calgary Herald*; feature writing, Frank Lowe, *Montreal Star*; staff correspondence, I. Norman Smith, *Ottawa Journal*; spot news photography, Roger St. Jean, *Montreal La Presse*; feature news photography, Jack Marshall, *Toronto Star*; cartooning, Merle Tingley, *London Free Press*. Bowater journalism prizes went to Allan Kent, *Toronto Telegram*, and Frank Flaherty, free-lance writer, Ottawa. The Canadian aviation award for newspaper stories and articles was won by James Hornick, *Toronto Globe and Mail*.

The Canadian Weekly Newspaper awards for best all-round papers in their respective population groups went to the *Aurora Banner* (Ont.); *Lacombe Globe* (Alta.), and *Altona Red River Valley Echo* (Man.). T. F. E. Claridge, 80, publisher of the *Free Press and Economist*, Shelburne, Ont., was named Mr. Weekly Newspaperman of 1956. The Canadian Weekly Newspaper association approved the 20% tax imposed by parliament on advertising content of Canadian editions of United States magazines. Daily newspapers had almost unanimously opposed it editorially.

The American Newspaper guild held its 1956 convention in Toronto, Ont., with 250 delegates from 53 locals in the U.S. and Canada. The human rights committee, reporting that only 38 Negroes were employed on non-Negro newspapers, pointed to the need for an educational program on human rights.

(W. E. Et.)

Great Britain.—In 1955 the whole national press of London had been stopped by a dispute; in 1956 it was the turn of the provincial newspapers and the periodicals to suffer disorganization and, in many cases, complete cessation of production. The trouble began in January when compositors, machine minders and proof correctors, both in the provinces and in London (except in national and evening newspaper offices, where there were separate agreements), rejected a wage increase. The employers dismissed about 8,000 craftsmen for restricting output. After the sitting of two courts of inquiry, normal working was resumed in London toward the end of March and an agreement was obtained in May.

One hundred publications were unable to print at all and others appeared in unfamiliar type and sizes. A small number were printed abroad: the *Economist* was printed in Belgium one week, in Germany the next, and then in a Swiss monastery. The *Radio Times*, printed in France, appeared in four pages of standard newspaper size.

Government hopes that newspapers would be freed from statutory controls over the delivery of newsprint and the size of

newspapers by March 1956 were not realized.

Circulations of national morning newspapers, with a few exceptions, showed no great changes. Exceptions included the *News Chronicle* and the *Daily Sketch*. The newly merged Sunday paper, *Empire News and Sunday Chronicle*, gained 500,000 on the old circulation of the *Empire News*; the *Sunday Observer*, which had doubled its circulation since World War II, showed an increase of 37,000 in 12 months; figures for the *Sunday News of the World* dropped by nearly 500,000 in the same period.

There were continued increases in the sales of women's magazines at the expense of the general and mass-appeal weeklies. Among new periodicals were *Mirabelle*, a weekly for women; *Onward*, a Tory weekly; *Industrial Scotland*; *Catholic Education*; the *Veteran* and *Vintage Magazine*, for car and motorcycle connoisseurs; and *Nuclear Engineering*.

The 1956 edition of the *Newspaper Press Directory* listed 164 daily and Sunday newspapers, 1,362 weekly newspapers and 3,908 periodicals of all types.

Commonwealth.—Australia now had 55 daily newspapers with a combined circulation of nearly 4,000,000. The *Sydney Morning Herald* (1831) was converted into a public company, after being owned by the Fairfax family for 115 years.

The Indian government introduced a bill to establish a press council to maintain "journalistic control" and to watch against monopoly of newspaper control. The five-year-old Press (Objectionable Matters) act was allowed to lapse by the government.

International.—For the first time the number of radio receiving sets in use (257,000,000) throughout the world exceeded the global daily newspaper circulation rates (255,000,000). The publication *World Communications* of the United Nations Educational, Scientific and Cultural Organization (UNESCO) reported that Great Britain still had the highest newspaper readership rate, 609 copies of daily newspapers being sold for every 1,000 of population. The International Press institute, an organization of newspaper editors, after examining the situation of the press in 40 nontotalitarian countries, concluded in their survey *Government Pressures on the Press*, that in most of these countries the press was restricted by the government in some way or another. The survey gave a relatively clean record to Great Britain, the United States and the Scandinavian countries.

Europe.—Politically independent newspapers in Austria published certified sales figures for the first time. Circulations had declined (291 buyers of a daily newspaper in 1947 and 143 in 1956). There were printers' strikes in Den-

Number of Daily Newspapers in the World, 1955

AFRICA		United States (continental)§	1,841	EUROPE	
Algeria*	9	Virgin Islands§	3	Albania†	2
Angola†	3	Windward Islands†	2	Austria†	32
Congo*	6			Azores†	6
Egypt†	20	AMERICA, SOUTH		Balearic Islands†	6
Libya*	2	Argentina†	173	Belgium†	58
French Equatorial Africa†	1	Bolivia†	6	Bulgaria*	10
French West Africa*	3	Brazil†	254	Canary Islands*	5
Gabon†	9	British Guiana†	3	Channel Islands and Isle of Man*	3
Ghana†	1	Chile†	50	Czechoslovakia†	15
Guinea†	1	Colombia†	41	Denmark*	153
Madagascar†	5	Ecuador†	25	Finland*	62
Mali†	7	French Guiana†	1	France†	129
Mauritius†	11	Paraguay†	6	Germany (Democratic Republic)†	37
Niger*	4	Peru†	57	Germany (Federal Republic and West Berlin)†	680
Nigeria†	11	Surinam†	1	Gibraltar*	1
Senegal†	1	Uruguay†	31	Greece†	71
Seychelles*	3	Venezuela†	23	Greenland†	1
Somalia†	1			Hungary†	17
South-West Africa*	1	ASIA		Iceland†	5
Tanzania†	10	Aden*	1	Ireland, Northern*	4
Togo†	2	Afghanistan†	15	Ireland, Republic of*	9
Tunisia†	2	Burma*	32	Italy†	100
Upper Volta†	2	Cambodia†	8	Luxembourg†	4
Zambia†	6	Ceylon*	11	Madeira†	3
Zimbabwe†	19	China (continental)†	450	Malta*	2
		China (Formosa)†	27	Netherlands†	105
		Cyprus*	9	Norway*	89
		Hong Kong†	330	Poland†	34
		India†	75	Portugal (continental)†	20
		Indonesia†	27	Rumania†	15
		Iran†	30	Saari†	4
		Iraq†	23	Spain (continental)†	109
		Israel†	143	Sweden†	162
		Japan†	4	Switzerland†	118
		Jordan†	5	Union of Soviet Socialist Republics†	500
		Kashmir and Jammu*	25	United Kingdom:	
		Korea, North†	34	England	101
		Korea, Republic of†	30	Northern Ireland*	4
		Lebanon†	1	Scotland†	16
		Macao†	11	Wales*	4
		Malaya, Federation of*	2	Vatican City*	1
		North Borneo*	72	Yugoslavia†	13
		Pakistan†	15		
		Philippines†	5	OCEANIA	
		Portuguese India†	4	Australia*	60
		Ryukyu Islands†	4	Fiji*	1
		Sarawak*	1	Gum†	1
		Saudi Arabia*	12	Hawaii†	7
		Singapore*	31	New Caledonia*	1
		Syria†	30	New Zealand†	43
		Thailand†	160	Total	7,575
		Turkey†	28		
		Vietnam, South†			

§ Benn Brothers Ltd., *The Newspaper Press Directory and Advertisers' Guide 1956* (London, 1956). Figures in table represent enumeration of daily newspapers.
 * Figures derived from correspondence of compiler with embassies, ministries and consulates of the several countries to the United States.
 † Editor & Publisher International Year Book, 1956 (New York, 1956). Figures in table represent enumeration of lists.
 ‡ N. W. Ayer & Son's, *Directory of Newspapers and Periodicals, 1956* (Philadelphia, 1956). See tables, pp. 6-8.
 § United Nations Educational, Scientific and Cultural Organization, *World Communications: Press, Radio, Film, Television* (Paris, 1956).
 ¶ Despite this date, half the statistics for daily papers in this compilation were collected in 1952 and the remainder in 1953-54, making them valuable here chiefly for comparisons.
 † Estimated, in consultation with authorities.
 ‡ Printed annuals, almanacs, etc., issued by press or government in the several countries in 1956.

(F. L. Mt.)

mark, Finland and Norway. The last-named country, with 3,250,000 inhabitants, had 98 daily newspapers and 134 appearing from four times a week to once a fortnight, and no Sunday newspapers.

France suffered a newsprint shortage and the 11-week-old *Le Temps du Paris* succumbed. *L'Express*, a daily since Oct. 1955, reverted to weekly form. A bill was adopted in the national assembly giving a new charter offering some degree of independence to the state-aided French Press agency (Agence France Presse). Communist papers continued to decline. *France-Illustration* (originally *L'Illustration*, founded in 1843) was absorbed into the magazine *Nouveau-Fémina*.

One of Germany's oldest newspapers, the *Magdeburgische Zeitung* (1626), ceased publication. The editor and publisher of a neo-Nazi paper in south Bavaria were fined for libels against the federal chancellor and his minister of finance. Throughout Italy labour troubles affected newspaper production in May. Daily newspaper prices were increased by five lire. A new popular daily, *Il Giorno*, appeared in Milan.

In Turkey amendments to the press law included some forbidding publication of official *in camera* meetings and information calculated to spread economic unrest. Misgivings on these amendments were expressed both in Turkey and abroad.

Figures published on Press day (May 5) showed that 7,246 newspapers were being published in the U.S.S.R., with a daily circulation of more than 48,700,000 copies. The English-language *Moscow News* reappeared after six years, and *Amerika*, a Russian-language picture magazine sponsored by the U.S. Information agency, began distribution in the U.S.S.R. A new daily *Sovietskaya Rossiya*, published by the Communist party, was launched in July.

(See also ADVERTISING.)

(D. HN.)

New York. New York, one of the original 13 states of the United States, is known as the "Empire state." Northernmost of the middle Atlantic states, it covers an area of 49,576 sq.mi. of which 1,647 sq.mi. are water. Population: (July 1, 1956, est.) 16,195,000; (1950 census) 14,830,192. The largest cities and their 1950 populations are: New York 7,891,957; Buffalo 580,132; Rochester 332,488; Syracuse 220,583; Yonkers 152,798; Albany (state capital) 134,995; Utica 101,531; Schenectady 91,785; Niagara Falls 90,872; Binghamton 80,674.

History.—The elected officers of the state government during 1956 (chosen in Nov. 1954) were: governor, Averell Harriman (Dem.); lieutenant governor, George B. De Luca (Dem.); comptroller, Arthur Levitt (Dem.); attorney general, Jacob K. Javits (Rep.).

In the Nov. 1956 elections, New York state voters cast about 4,340,000 votes for Dwight D. Eisenhower for president, as against about 2,750,000 votes for Adlai E. Stevenson. The latter's total included about 280,000 Liberal party votes. Attorney General Jacob K. Javits was elected to the U.S. senate, defeating his Democratic opponent, Mayor Robert F. Wagner of New York city, by about 400,000 votes.

Twenty-six Republicans were elected to the U.S. house of representatives from New York state, and 17 Democrats and Democrat-Liberals.

During its 1956 session the legislature authorized a \$500,000,000 bond issue to finance highway construction.

This was approved in the general election. Governor Harriman also approved a \$126,000,000 highway program to make full use of available state and federal highway funds. Assisted by the new federal highway bill, the state planned to boost its annual highway construction program still further to \$300,000,000 to \$350,000,000 a year. Another significant measure approved

by the legislature was a bill making it compulsory for automobile owners to hold at least \$10,000–\$20,000 personal liability insurance and \$5,000 property damage, or proof of financial responsibility, before they could obtain 1957 registration plates.

The governor and legislature also approved abatements in the state tax on personal incomes, New York's largest single revenue source. Taxpayers were allowed to deduct 15% of the first \$100 of tax to be paid and 10% of the next \$200, to a maximum of \$35.

New York state, which spends a third of its budget for education, substantially increased state education aid to communities. Such payments would total approximately \$504,000,000 during the 1957–58 fiscal year, or about \$83,000,000 more than in 1956–57. Teachers were granted a higher minimum state-wide salary schedule. Another measure allotted \$100,000 to the state education department to set up experimental programs in closed-circuit educational television.

To assist in the construction of middle income housing, the legislature authorized a \$100,000,000 bond issue, which, however, was defeated in the 1956 general election.

The sugar maple tree (*Acer saccharum*) was declared the official state tree by act of the legislature.

Work on the St. Lawrence seaway and power projects in northern New York continued. Completion of the seaway, expected in 1959, would open a new coast line for ocean commerce along the St. Lawrence river and the Great Lakes. Power delivery was expected in 1958. The state power authority contracted to sell 108,000 kw. of St. Lawrence river power to the state of Vermont, 33,000 kw. to Plattsburg, N.Y., and 11,000 kw. to the U.S. air force base at Plattsburg.

The U.S. Atomic Energy commission licensed the Consolidated Edison company of New York to construct one of the nation's largest power reactors. The \$55,000,000 power station, to be built at Indian Point on the Hudson river, 24 mi. N. of New York city, would develop 236,000 kw. of power.

Rock slides at Niagara falls on June 7 demolished the Schoellkopf station of the Niagara Mohawk corporation, largest power plant in the Niagara river gorge. The slides were attributed to seepage of water from points above the falls into rock crevices.

The United States Merchant Marine academy at Kings Point, L.I., was made a permanent federal institution after two decades of operation.

Congress changed the name of Bedloe's Island in New York harbour to Liberty Island in tribute to its famous occupant, the Statue of Liberty.

Education.—New York educational institutions held classes for approximately 3,430,000 students in the 1954–55 school year. Public schools accommodated a total of 2,400,000, enrolling 1,500,000 children through grade 6 and 900,000 in grades 7 through 12. Private and parochial schools enrolled approximately 604,000 elementary pupils and 101,000 secondary school students. Enrolment in universities, colleges and other institutions of higher learning in the state in the fall of 1955 totalled 325,370.

The State University of New York, established in 1948, has administrative jurisdiction over 26 state-supported institutions of higher education. Special state schools include 11 community colleges, 141 schools of nursing, 3 institutes for the blind and 7 for the deaf.

Social Insurance and Assistance, Public Welfare and Related Programs.—Approximately 1,300,000 persons were given assistance, care or service at public expense in New York state during 1955. Expenditures for public charges during the year were \$516,000,000, of which the federal share was \$112,000,000, the state share \$154,000,000 and the local share \$250,000,000. In addition, about 2,600,000 persons received assistance or care from private institutions or agencies (such as Community Chests, etc.) under the supervision of the state department of social welfare.

In the fiscal year April 1, 1955, to March 31, 1956, the average yearly population of the state's 17 correctional institutions was approximately 19,000, and the estimated average cost of care and maintenance per person was \$1,746.77.

The state maintains 27 institutions to provide care and treatment of the mentally ill, mental defectives and epileptics. Facilities include 18 hospitals, six schools for mental defectives, a colony for epileptics, the New York State Psychiatric institute for research and teaching and the Syracuse Psychopathic hospital for observation and temporary treatment of mental patients. Care and treatment of these patients in 1956–57 was estimated to cost \$116,400,000. The state also operates four "after-care" clinics where patients can be treated after being released from hospitals.

Communications.—The final link in the New York State Thruway was

completed in Aug. 1956. The Thruway now extends 427 mi. from New York to Buffalo. The state's network of highways included more than 103,000 mi. of improved roads in 1956. Of these, approximately 1,200 mi. were in the interstate system, 14,000 mi. in the state system, 18,000 mi. in county systems, 54,000 mi. in town systems and 16,000 mi. in cities and villages.

Thirty-six railroads operate a total of 7,500 mi. of single track within the state. Motor vehicles registered in the state in 1955 totalled 4,807,747, including 3,895,841 passenger cars, 489,140 trucks, 209,185 suburban vehicles, 18,204 buses, 24,583 taxis and 136,867 trailers.

New York state had 272 landing facilities, including 224 airports, 38 plane bases and 10 heliports, in 1956. The airports included 45 municipally owned, 168 privately owned and 11 military bases.

During 1955 the four New York city metropolitan airports—New York International at Idlewild (largest airport in the world), LaGuardia, Newburgh and Teterboro—handled a total of 10,852,914 air passengers. The four airports also handled 302,365,500 lb. of air cargo and 86,456,300 lb. of mail.

Banking and Finance.—At the end of 1955, 641 banks with total resources of \$61,660,274,000 and deposits of \$55,069,816,000 were operating in New York state. In addition, there were 235 savings and loan associations with about \$2,900,000,000 total assets and \$2,499,791,000 due private reholders.

State income during the fiscal year ended March 31, 1956, for the general and capital construction funds totalled \$1,368,600,000. Total outgo in these funds was \$1,314,600,000. The excess of income over outgo, \$54,000,000, was transferred to the capital construction fund, which thus had a usable balance of \$163,400,000. Fifty-seven per cent of the state's general fund expenditures was allocated to local units of government in the form of aid for schools, welfare, highways, health and other operations. The remaining 43% paid for the operations of the 19 state departments, the commissions and agencies, 60 state correctional and health institutions and 29 state colleges, as well as the legislature, courts and highway maintenance. Tax stabilization reserve funds aggregated \$145,700,000 on March 31, 1956, while the state debt totalled \$675,600,000.

Agriculture.—Cash receipts from farm marketings of agricultural products in 1955 were \$806,043,000. The 1954 total was \$811,320,000. In addition, government payments to farmers in 1955 were \$4,486,000, compared with \$3,753,000 the previous year. Cattle sold for meat were valued \$52,242,000, and sale of milk and other dairy products in 1955 amounted to \$386,896,000. The total acreage of principal crops harvested in 1955, including orchards and vineyards, was 5,476,000.

The value of livestock and poultry on farms as of Jan. 1, 1956, was \$4,671,000. There were 2,288,000 head of cattle in the state, 12,085,000 chickens, 62,000 horses and mules, 157,000 hogs and 156,000 sheep. Turkeys raised totalled 848,000.

Table I.—Principal Crops of New York

Crop	Indicated 1956	1955	Average 1945-55
Wheat, bu.	33,408,000	34,105,000	27,688,000
Oat, bu.	8,940,000	10,075,000	10,613,000
Rye, bu.	24,725,000	28,741,000	25,869,000
Barley, bu.	2,412,000	2,412,000	2,382,000
Hay, tons	5,369,000	5,196,000	5,747,000
Beans, dry (100-lb. bags)	1,434,000	954,000	1,394,000
Beans for beans, bu.	85,000	80,000	96,000
Peas, bu.	18,762,000	18,455,000	18,520,000
Clover, bu.	13,500,000	19,700,000	14,761,000
Alfalfa, bu.	1,030,000	1,400,000	1,310,000
Timothy, bu.	470,000	700,000	478,000
Grass, bu.	110,000	88,500	63,160
Hay, tons	16,900	37,800	23,010
Straw, tons	31,000	37,000	40,000
Sugar, lb.	382,000	461,000	402,000
Syrup, gal.			

Source: U.S. Department of Agriculture.

The U.S. census of agriculture in 1955 placed the number of farms in New York state at 105,714. The estimated average value of land and buildings per farm was \$15,179.

Manufacturing.—In 1954 the state's manufacturing firms added \$14,149,000 in value to the raw and semifinished materials they purchased for processing, compared with \$9,655,859,000 in 1947, according to the U.S. Bureau of the census. The state has 430 of the 453 separate industrial categories recognized by the U.S. Bureau of the census.

In terms of value (1953 figures), New York state produces approximately 67% of the country's total output of women's dresses, coats and suits, 94% of women's furs and 41% of men's and boys' tailored clothes. The state leads all others in the apparel, printing and publishing, paper

Table II.—Principal Industries of New York

Product	All employees 1954	Salaries and wages 1954 (in 000s)	Value added by manufacture 1954 (in 000s)	Value added by manufacture 1953 (in 000s)
Food and kindred products	151,141	\$621,001	\$1,369,415	\$1,240,474
Textile mill products	66,761	234,773	417,793	453,334
Lumber and related products	380,009	1,198,669	1,963,141	2,126,938
Chemical and allied products (except rubber and plastics)	17,994	59,587	93,261	81,191
Metals and metal products	37,987	146,131	249,195	260,537
Stone and allied products	64,187	261,175	471,780	501,628
Printing and publishing industries	170,969	831,709	1,589,768	1,469,011
Chemicals and allied products	67,818	304,959	867,140	880,390
Food and kindred products	6,008	28,994	50,789	57,031
Chemical products	9,900	40,520	60,545	66,197
Textile and leather products	61,031	180,654	271,531	299,390
Stone, clay, glass products	40,152	165,891	321,345	323,159
Primary metal industries	74,592	339,148	614,228	732,067
Chemical products	96,949	402,529	682,548	725,599
Chemical products	148,633	685,683	1,188,086	1,267,484
Chemical products (except electrical)	126,415	524,198	936,408	983,274
Chemical machinery	142,125	711,421	1,192,854	1,081,342
Transportation equipment	80,442	386,882	704,169	745,446
Chemical and related products	166,581	642,788	1,097,797	1,100,115
Chemical products				

Source: U.S. Department of Commerce, 1954 Census of Manufactures, preliminary report.

Table III.—Mineral Production of New York

Mineral	1953				1954†	
	Quantity	Value	Quantity	Value	Quantity	Value
Total		\$186,868,000		\$192,764,000‡		
Cement (bbl.)	14,965,000	39,388,000	14,497,000	38,861,000		
Clays	961,000	1,303,000	1,199,000	1,494,000		
Coke*	4,590,000	69,907,000	3,579,000	52,686,000		
Emery	11,000	144,000	10,000	132,000		
Gypsum	987,000	3,507,000	1,134,000	4,005,000		
Petroleum*	268,000	71,735,000	171,000	46,984,000		
Iron ore	3,825,000	36,346,000	3,139,000	31,707,000		
Iron, pig*	4,698,000	237,030,000	3,589,000	181,610,000		
Lead	1,000	376,000	1,000	325,000		
Natural gas (thousand cu.ft.)	2,347,000	742,000	2,598,000	847,000		
Petroleum (bbl.)	3,800,000	16,260,000	3,257,000	11,140,000		
Salt	3,323,000	17,351,000	3,413,000	22,754,000		
Sand and gravel	22,531,000	23,494,000	30,082,000	29,756,000		
Slate	114,000	1,733,000	115,000	1,742,000		
Stone	15,962,000	25,251,000	19,410,000	31,426,000		
Talc	156,000	941,000	?	?		
Zinc	52,000	11,852,000	53,000	11,491,000		
Other minerals . . . . .	...	8,180,000	...	9,941,000		

*Values for processed materials are not included in the totals.

†Preliminary.

‡Total has been adjusted to eliminate duplication in value of clays and stone.

§Value included with other minerals.

Source: U.S. Bureau of Mines.

and paper products and furniture industries. It produces 67% of the value of photographic equipment manufactured in the nation. The state is also noted as a producer of food products, chemicals, leather goods, optical instruments and lenses, millinery, children's wear, scientific instruments, dolls, costume jewelry and office machines.

As of June 1955, 571,900 business firms were operating in New York state. There were 5,907,000 persons employed in the state in 1955, exclusive of agricultural workers, proprietors, domestics and personnel of the armed forces, a gain of about 1,700,000 since 1939.

During 1955 the state of New York certified unemployment insurance claims totalling \$222,394,827. On Dec. 31, 1955, the New York state unemployment insurance trust fund had a balance of \$1,273,105,385.

(E. M. De.)

Mineral Production.—Table III shows the tonnage and value of those minerals produced in New York in 1953 and 1954 whose values exceeded \$100,000. In 1954 New York was first among the states in output of ilmenite and in output of muscovite block and film mica, second in cement shipments and petroleum asphalt sales and in salt output (17% of the national total of salt), third in sand and gravel and in slate, fourth in iron ore output. The state rated 18th in the value of its mineral output, with 1.38% of the U.S. total.

New York City. The mid-1956 estimate of the population of New York city was 8,074,000 (1950 census, 7,891,957). This figure represented a small decline from a year previously, which may have been accounted for by a corresponding increase in neighbouring suburban communities. The area of the city is 315.1 sq.mi.

Recognizing the fact that the metropolitan area had grown to include towns, villages and cities as far away as 50 mi., whose residents travel to New York to work, to shop or for recreation, the New York city administration of Mayor Robert F. Wagner instituted a metropolitan regional conference. This association of officials of all the affected localities was formed to consider problems, such as water supply, air pollution, traffic and transportation, common to the entire metropolitan area and to work together to effect their solution.

The expense budget for the 1956-57 fiscal year continued to rise, setting a new high at \$1,853,795,103. Among the expenditures was the appropriation of \$4,012,962 for the New York city youth board to expand its program for combating juvenile delinquency. The board co-ordinates the activities of private and governmental agencies and sends trained workers into neighbourhoods that show a high incidence of juvenile crime to direct the energies of these young persons into productive channels. In areas where the youth board activities were intensified, the incidence of juvenile delinquency during the year rose only 3%, less than half the rise in other areas.

The first commercial heliport of New York city was opened, and plans were formulated for a regional network of such facilities. Initially, flights would carry mail and cargo to and from the three airports serving the city, with passenger flights to follow.

By way of strengthening the city's position as the commercial and financial centre of the nation, New York saw the opening of two buildings devoted entirely to industry promotion. They were the Trade Show building and the Coliseum, which during

the year accommodated 76 conventions, expositions and trade shows.

Two historic landmarks underwent changes. The name of Bedloe's Island, in the harbour of New York, was changed by act of congress to Liberty Island, considered a more appropriate name for the site of the Statue of Liberty; and City hall, after two years of renovation at a cost of more than \$2,000,000, was rededicated with ceremonies reminiscent of the years 1803-12, when the building was first erected.

For a while Broadway seemed to be losing its distinction as the city's centre of the lively arts. A repertory group performed Shakespeare under the stars in an amphitheatre overlooking the East river. Classical and popular concerts could be heard in several parks. Opera, the classics and new works of little-known authors flourished in Greenwich Village, along Second avenue and in other outlying districts. But Broadway offered the most distinguished array of new plays in many years, the best of which was *My Fair Lady*, a musical adaptation of George Bernard Shaw's *Pygmalion*.

In baseball, a "subway" series was played between the New York Yankees and the Brooklyn Dodgers, from which the New York Yankees emerged as world champions. (W. R. PR.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Arteries of New York City* (1952); *New York City* (1955); *Northeastern States*, 2nd ed. (1955); *Story of a City: New York* (1955).

New Zealand. A realm of the Commonwealth of Nations in the South Pacific, New Zealand proper comprises the large North and South Islands, and Stewart, Chatham and other minor islands. Dependencies: (1) island territories (Tokelau Islands and Cook and associated islands); (2) Ross (antarctic) dependency; (3) Western Samoa (trust territory). Area: New Zealand proper 103,740 sq.mi.; island territories 19 sq.mi.; Ross dependency about 175,000 sq.mi.; Western Samoa 1,131 sq.mi. Pop. (1951 census): New Zealand proper 1,939,472, including 115,676 Maoris; island territories 21,205 (including 15,079 in Cook Islands); Western Samoa (1954 est.) 94,128. Pop. of New Zealand proper (1956 prelim. census): 2,172,350 (including 135,015 Maoris); island territories (1955 est.) 23,000. Language: English; Maori (a Polynesian language). Religion: Christian (Anglican 37.5%, Presbyterian 23%, Roman Catholic 13.6%, Methodist 8%, Baptist 1.7%). Chief cities (1951 census, 1953 est. in parentheses): Wellington (cap.) 120,072 (126,500); Auckland 127,406 (131,400); Christchurch 123,548 (126,600); Dunedin 69,829 (71,000); Hutt 44,474 (46,600). Queen, Elizabeth II; governor general in 1956, Lieut. Gen. Sir Willoughby Norrie; prime minister, Sidney George Holland.

History.—New Zealand's economy continued to expand with a steady growth of population and employment during 1956. Both production and trade increased considerably but inflationary pressures continued to cause balance of payment problems.

Factory production rose by 10.4% in volume. Total farm production increased by 2%, largely because of extra productivity as the result of aerial top-dressing of pastures with fertilizers. Increased production was accompanied by an increase of exports. Total receipts for the year ended June 30 were the highest on record at £319,600,000. The export value of wool was £94,100,000, butter and cheese, £75,100,000, meat £71,600,000. The United Kingdom was again the biggest customer for these products but there was a noticeable increase in exports to European countries, mainly France and Germany.

In the financial field the gross capital investment totalled £257,000,000. Prices were reasonably stable, the year's increase being 3.1%. The demand for private imports totalled £238,600,000 for the year 1955-56. The primary problem of the economy was the excess demand for the available resources of labour

and materials. The government met the situation by monetary and fiscal measures reinforced by physical controls on imports, instalment buying, as well as by raising loans and encouraging savings, viz., by an internal conversion loan of £50,000,000 and a £10,000,000 loan on the London market. A question of some concern to the export market was the disposal of U.S. surplus farm products and strong representations were made from time to time at the highest government levels. The monetary commission's report was issued in April. It concluded that no radical reform was needed in the financial structure of the country but did recommend a number of ways in which the administration of monetary, banking and credit systems could be improved.

The budget recommended no major changes; for the year ended June 30 it showed an over-all deficit of £5,200,000 in the country's overseas transactions. The government capital program for the year ending March 1957 was estimated at £78,700,000. The Consolidated fund showed estimated receipts of £204,100,000, and expenditure of £200,400,000.

In external relations the Sudan was formally recognized, as were Tunisia and Morocco later. Emphasizing the growing importance of Pacific affairs to New Zealand, a commissioner for southeast Asia was appointed in April and also accredited to Thailand. The minister of external affairs, T. N. Macdonald, attended a meeting of the Southeast Asia Treaty organization at Karachi in March. The prime minister, S. G. Holland, visited Australia in February, when trade and defense problems were discussed. He also visited Japan, the United States and Canada on the way to the meeting of commonwealth prime ministers in London in June. When the Suez canal crisis occurred New Zealand was represented at the London conference by T. N. Macdonald. When Britain and France intervened in Egypt full confidence was expressed by the prime minister in the intention of the United Kingdom in moving forces into the canal zone. The United Nations' proposal for a police force was welcomed and New Zealand was among the first to offer a contribution. During the year the "Royalist," one of the world's most modern and powerful cruisers, was added to the New Zealand navy.

One of the main items in legislation was reciprocity in social security with the United Kingdom. Other items of interest were a search for oil on the east coast of the North Island, and the start made with the building of the Auckland harbour bridge, the culmination of 20 years' effort. (A. T. CL.)

Education.—Schools (1953): primary (including Maori, private, district high and intermediate schools or departments) 2,373, pupils 359,537, teachers 10,685; secondary (including secondary departments of district high and combined secondary-technical schools, and 30 technical schools) 285, pupils 67,478, teachers 3,357; vocational 33, pupils 20,106; part-time vocational centres 157, students 30,637; pupils in correspondence schools (for isolated areas) primary 1,645, secondary 482, technical 1,757. Teacher-training colleges (1953) 5, students 2,354. University of New Zealand (4 constituent colleges and 2 associated agricultural colleges), students (Oct. 1955) 4,823.

Finance and Banking.—Monetary unit: New Zealand pound, at par with the pound sterling (=2.80 U.S. dollars). Budget (consolidated fund, 1955-56 actual): revenue £N.Z. 197,433,000, expenditure £N.Z. 193,282,000; (1956-57 est.) revenue £N.Z. 204,100,000, expenditure £N.Z. 198,316,000. Social security fund (1955-56; 1956-57 est. in parentheses): revenue £N.Z. 74,111,000 (£N.Z. 76,500,000), expenditure £N.Z. 72,883,000 (£N.Z. 75,431,000). Total public debt (March 31, 1955) £N.Z. 730,084,000, of which £N.Z. 99,880,000 domiciled in London. Currency circulation (Feb. 1955) £N.Z. 64,000,000, (Feb. 1956) £N.Z. 65,400,000. Deposit money (Feb. 1955) £N.Z. 251,400,000, (Feb. 1956) £N.Z. 252,900,000. Gold and foreign exchange (reserve bank March 1955) U.S. \$225,000,000, (March 1956) U.S. \$192,000,000.

Foreign Trade.—(1955) Imports £N.Z. 287,100,000, exports £N.Z. 258,600,000. Main sources of imports: U.K. 55%; Australia 12%; other sterling area 7%; U.S. and Canada 12%; continental European Payments Union countries. Main destinations of exports: U.K. 7%; continental E.P.U. 11%; Australia and other sterling area 6%; U.S. and Canada 9%. Main exports: wool 36%; butter 20%; lamb 17%.

Transport and Communications.—Roads (March 1953): 124,000 km., of which 88,740 km. formed roads. Licensed motor vehicles (Sept. 1955): passenger 373,817, commercial 107,784. Railways (1954): 5,700 km.; freight, ton-km. (April 1955-56) 1,872,000,000. Shipping: merchant vessels of 100 gross tons and more (July 1955) 160; total tonnage 239,879. Air transport (1954): passenger-km. 238,752,000; cargo, ton-km. 7,388,400. Telephones (March 1955) 496,293. Licensed radio receivers (March 1956) 516,800.

Agriculture.—Main crops (metric tons, 1955; 1954 in parentheses): wheat 79,000 (112,000); barley 43,000 (45,000); oats 31,000 (29,000). Miscellaneous production (metric tons, 1954; 1953 in parentheses): potatoes 154,000 (168,000); dry peas 24,000 (26,000); tobacco 2,400 (1,900). Livestock (Sept. 1955): cattle 5,924,000; sheep 39,500,000; pigs 160,000; pigs 689,000. Food production (metric tons, 1954): beef 14,800; mutton and lamb 364,800; pork 39,600; (1955) butter 196,800; cheese 96,000; milk (1952-53) 5,342,000. Wool production, clean basis (1955) 144,000 (138,000 metric tons in 1954).

Industry.—Fuel and power (1955): coal 804,000 metric tons; lignite 776,000 metric tons; manufactured gas 147,600,000 cu.m.; electricity (excluding industrial generation) 4,032,000,000 kw.hr. Production (metric tons, 1954): tungsten ore 18; superphosphates (April 1953-54) 727,000; food pulp (mechanical) 54,000; (chemical) 21,000; sawn softwood 140,000 cu.m.; cement (1955) 410,400.

Nicaragua. A Central American republic. Nicaragua is situated between Honduras on the north and Costa Rica on the south. Area: 57,143 sq.mi., of which 3,475 sq.mi. is water. Pop.: (1950 census) 1,057,023; (1955 est.) 1,261,000. Capital: Managua, pop. (1950 census) 109,352. Other large cities: Chinandega, 13,146; Granada, 21,035; León, 30,544; Masaya, 19,743; and Matagalpa, 10,323. Language: Spanish. Religion: Roman Catholic. President in 1956: Gen. Anastasio Somoza; acting chief of state from Sept. 29, Luis Somoza Debayle.

History.—In Feb. 1956, Pres. Anastasio Somoza declared his ineligibility for renomination as the Liberal party candidate for president during the 1957-1963 term. The constitution had been revised earlier to sanction re-election. In March the president began an earnest campaign; in April he promised free elections; in May some political prisoners were released; and in June the Congress acted favourably on his proposal for liberalized regulations governing libel and other press difficulties.

Two plots to kill the president were uncovered during the first half of the year. In May two youths were intercepted as they returned to Nicaragua from Mexico. In June arrests involved three men, most important of whom was Hernán Robleto, director of Managua's *La Flecha*.

The Liberal party convened on Sept. 20 at León to select the president once more as standard bearer. The candidate, while circulating among his adherents at a celebration on the following night, was shot four times by a youth. The assassin was killed immediately by guards. Efforts to save the president's life were resisted by Pres. Dwight D. Eisenhower, who ordered U.S. army surgeons to Nicaragua. They sent Somoza by air to the Panama Canal Zone Gorgas hospital, but he died on Sept. 29, thus ending his 20-year rule over Nicaragua.

Following the shooting a state of siege was declared. Luis Somoza Debayle, the older son and first designate took over the duties of chief of state. He assumed responsibility without incident. The national guard, under West Point graduate Anastasio Somoza Jr., jailed a considerable number of suspected Somoza enemies but was faced with no organized opposition. Apparently the assassin had acted independently. The heir apparent, Luis, was nominated in October to be the Liberal party presidential candidate in the election set for Feb. 1957.

The Nicaraguan Institute of Social Security was faced with numerous complaints from both employers and employees that the contributions schedule was too high. The agency, created in Dec. 1955, was 25% state supported. Other funds came from an assessment upon employers of 8% of total wages. Employees paid 5% of their wages. The employers' contribution was to provide the job accident insurance; the workers paid for other disability, funeral and survivor benefits coverage. No unemployment insurance was provided for. The International Bank for Reconstruction and Development lent \$3,200,000 to improve the port of Corinto. The loan raised to \$21,400,000 the agency's support to Nicaraguan economic development.

(See also ORGANIZATION of AMERICAN STATES.) (R. HN.)

Education.—In 1953 there were 1,765 state elementary schools, 6 normal schools, 39 secondary schools, 6 professional schools, 1,727 mixed (urban and rural) schools, 49 other schools and 1 university (León) with a total of 14,899 teachers and 123,832 pupils. About 65% of the population is

illiterate.

Finance.—The monetary unit is the córdoba, valued during 1956 at 14.18 cents U.S. currency, official rate, and on June 30, 1956, at 12.9 cents, curb rate. The national budget for the fiscal year 1956-57 (July 1-June 30) totalled 264,754,497 córdobas. The public debt (Dec. 31, 1955) was 51,497,260 córdobas, of which 33,842,779 córdobas was external. Currency in circulation (May 31, 1956) totalled 115,500,000 córdobas; demand deposits, 152,700,000 córdobas. The retail food price index (Managua) stood at 121 in April 1956 (1953=100).

Trade and Communications.—Exports in 1955 totalled \$80,022,000; imports, \$69,646,000. Leading exports were cotton (39%), coffee (35%), gold (10%), timber (4%) and cottonseed (4%); leading imports, machinery and apparatus (16%), vehicles and parts (14%), chemicals and drugs (13%) and food products (8%). Leading customers were the U.S. (37%), Germany (16%), Japan (13%), the Netherlands (13%) and the U.K. (8%); leading suppliers, the U.S. (65%), Germany (6%), the Netherlands Antilles (6%), the U.K. (3%) and Panamá (3%).

In 1953 there were 235 mi. of main line railway and (1950) 445 mi. of surfaced highways. On Jan. 1, 1955, there were 4,078 automobiles, 2,302 trucks and 302 buses. Telephones (Jan. 1, 1955) numbered about 3,600, none of which was automatic. Radios numbered about 16,000 in 1952.

Agriculture.—Exports in 1955 included cotton 48,465 short tons, coffee 310,000 bags of 132 lb. each, bananas 469,919 stems, cottonseed 70,760 short tons, sesame 11,055,000 lb., ipecacuanha 33,624 lb., live cattle 20,775 head, timber 37,347,000 bd.ft. Preliminary production estimates for 1955-56 included cotton 160,000 bales of 500 lb. gross weight, coffee 476,000 bags, rice 75,000,000 lb. Cattle (1954) numbered 1,200,000.

Minerals.—In 1955, 229,601 troy oz. of gold were exported.

(J. W. Mw.)

Nickel. World production of nickel, given in Table I, increased in 1955 chiefly because of expansion in the Canadian industry. Tables I and II are based on U.S. bureau of mines data.

Table I.—World Mine Production of Nickel

	(In short tons)				
	1951	1952	1953	1954	1955
Canada	137,903	140,559	143,693	161,279	174,581
Cuba . . . . .	...	8,924	13,844	14,545	15,138
Finland	?	65	309	89	134
New Caledonia	4,600	9,900	13,100	13,000	19,500
South Africa	1,254	1,444	1,891	2,112	2,598
United States	756	633	602	831	3,807
Total (excl. U.S.S.R.)	145,000	162,000	174,000	192,000	216,000

United States.—Production of nickel greatly increased when the new plant at Riddle, Ore., began producing in Jan. 1955. In 1956, 54,035 tons was consumed in the first eight months.

Table II.—Nickel Supply in the United States

	(In short tons)				
	1951	1952	1953	1954	1955
Production	756	633	602	2,006	3,807
Secondary recovery	8,602	7,749	8,352	8,600	11,500
Imports*†	101,620	118,372	131,685	144,100	143,696
Nickel content	93,116	108,850	118,737	131,784	142,598
Exports*†	4,622	6,941	15,168	14,245	20,596
Consumption	86,416	101,397	105,681	94,733	101,929

*Includes gross weight (not nickel content) of ore, matte, oxide, alloys and scrap.

†Due to changes in classification, 1952-54 data are not strictly comparable to earlier years.

Canada.—About 15 mines supply nickel ore to five companies which refine it and provide the principal part of the world's nickel production. About two-thirds of Canada's nickel output in exported to the United States.

Cuba.—Methods were improved for beneficiating the ore used at the U.S. government-owned nickel plant at Nicaro. In 1955 the output was 593 tons more than in 1954.

Philippine Republic.—Nickel-bearing ore reserves on Nonoc Island, estimated at 29,000,000 tons of ferruginous laterite and serpentine containing 1.38% nickel, received special attention in 1955. (F. E. H.; B. B. M.)

Niger: see FRENCH UNION; FRENCH WEST AFRICA.

Nigeria. This British dependent country in West Africa is bounded west, north and east by French African territories and south by the Atlantic ocean. Historically, it comprises a coastal colony (1,381 sq.mi.), a protectorate (337,788 sq.mi.) and Cameroons under United Kingdom trusteeship (34,081 sq.mi.), the northwest part of former German Kamerun; but it is administered as a federation of three semiautonomous regions, a quasi-federal territory (Southern Cameroons) and the federal capital territory of Lagos. Areas and populations are as follows:

	Area (sq. mi.)	Pop. (mid-1955 est.)	Governor	Premier
Nigeria	373,250	32,780,000	Sir James Robertson*	—
Western region	45,376	6,400,000	Sir John Rankine	O. Awolowo
Northern region	281,782†	17,800,000	Sir Bryan Sharwood-Smith	Sardauna of Sokoto
Eastern region	29,484	7,500,000	R. D. S. Stapledon	N. Azikiwe
Southern Cameroons	16,581	780,000	E. J. Gibbons‡	—
Lagos, fed. cap	27	300,000		

*Governor general, Federation of Nigeria. †Including Northern part of Cameroons trust. ‡Commissioner.

Tribal groups (1952-53 census): Hausa (17.8%) and Hausa-speaking Fulani (9.8%), mainly in the Northern region; Ibo (17.5%), mainly in the Eastern region and Southern Cameroons; Yoruba (16.2%), mainly in the Western region. Religion: Moslem (north); pagan (south); Christianity widespread among the educated. Capitals (pop., 1952-53 census): Lagos (federal) 267,407; Ibadan (Western region) 459,196; Kaduna (Northern region) 38,794; Enugu (Eastern region) 62,764; Buea (Southern Cameroons) 3,009. Chief towns (pop., 1952-53 census): Ogbomoshosho 139,535; Kano 130,173; Oshogbo 122,728; Ife 110,790; Iwo 100,006.

History.—The visit of Queen Elizabeth II and the duke of Edinburgh (Jan. 28-Feb. 17, 1956) was hailed throughout Nigeria with unprecedented scenes of enthusiasm.

In Dec. 1955 the federal government received a grant of £1,500,000 made available under the Colonial Development and Welfare act, for improving the federal trunk road system, and in April 1956 announced proposals for a federal naval force. In May it placed contracts in Great Britain worth £4,200,000 for the supply of telephone and telecommunication equipment.



NIGERIAN NATIVES welcoming Queen Elizabeth II and the duke of Edinburgh during their visit to the British colony in 1956

Western Region—In Dec.

1955 the house of assembly adopted a resolution demanding full regional self-government in 1956. In April 1956 two ministers resigned their

portfolios and membership of the Action group following disagreement with the premier, Chief O. Awolowo, whom they accused of dictatorship. In May the premier announced the dissolution of the house of assembly, and elections took place on May 26 when the Action group was returned with a reduced majority.

Eastern Region.—On July 17 the premier, N. Azikiwe, announced that he contemplated resigning as a result of a disagreement with the governor, Sir Bryan Sharwood-Smith, over the alleged investment of funds in the African Continental bank that he had founded, and on July 24 the secretary of state for the colonies, A. T. Lennox-Boyd, announced that he would appoint a tribunal of inquiry under the chairmanship of Sir Stafford Foster-Sutton, chief justice of the federation, to investigate the dispute. The crisis thus induced resulted in the postponement of the constitutional conference scheduled to open in London in mid-September. It was hoped it would be held in Jan. 1957. Announcements were made that grants totalling £2,283,900 from Colonial Development and Welfare funds had been received for rural water supplies, regional roads and bridges, and that in pursuance of the Nigerianization policy there were more Nigerians than expatriates in senior service posts.

Northern Region.—It was announced in Dec. 1955 that the Nigerian Railway corporation was to extend rail facilities to link Maiduguri, Bauchi and Lafia at a cost of £18,000,000. A grant of £3,450,000 was made from Colonial Development and Welfare funds for class B trunk roads to supplement the main trunk system, and a similar grant of £1,300,000 was received toward a £1,950,000 scheme for rural water supplies. In May the Northern Peoples Congress party (the government party) declared it would ask for regional self-government by 1959 at the London conference. Elections to the enlarged house of assembly in November resulted in the return of the N.P.C. party with an overwhelming majority. (W. H. Is.)

Education.—Schools (1955): primary school pupils, approximately 1,500,000; secondary schools 84. Institutions of higher education four, including University college of Ibadan with 405 students.

Finance and Trade.—Monetary unit: West African pound (£W.A.1=£1 sterling=U.S. \$2.80). Budget (1954-55): revenue £54,272,000, expenditure £52,419,000. Foreign trade (1955): imports £135,800,000, exports £132,000,000. Main exports: peanuts, cocoa, hides, palm oil and kernels cotton, timber, bananas.

Nixon, Richard Milhous

(1913-), U.S. vice-president, was born on Jan. 9 at Yorba Linda, Calif., near Los Angeles. He was educated at Whittier college, Whittier, Calif., and at Duke university, Durham, N.C., and practiced law for five years at Whittier. After a few months in Washington, D.C., as attorney for the Office of Emergency Management (Jan.-Aug. 1942), Nixon was commissioned a lieutenant, junior grade, in the U.S. navy. He saw service in the South Pacific and by the time of his discharge in 1946 had been promoted to lieutenant commander. In Nov. 1946 he was elected to the U.S. house of representatives as a Republican from the 12th California district and was re-elected in 1948 for a second term. In the house he was appointed to the un-American activities committee and figured prominently in the investigations that led to the Alger Hiss trial. In Nov. 1950 he was elected U.S. senator from California.

In 1952 Nixon was selected vice-presidential candidate to run on the Republican ticket with Dwight D. Eisenhower, and they won a decisive victory at the polls. Nixon was sworn into office as the 36th U.S. vice-president on Jan. 20, 1953, at Washington



VICE-PRESIDENT NIXON napping aboard his plane between speaking engagements during the pre-election campaign of 1956

Shortly before President Eisenhower's inauguration. He became one of the administration's most active and trusted "trouble shooters," not only in domestic political matters but in foreign affairs, and was repeatedly commended by President Eisenhower. Shortly after the president's decision to run for a second term in 1956 he declared on March 7: "I have no criticism of Vice-President Nixon to make, either as a man, associate, or as my running mate. . . ." Nevertheless a group of Republicans led by Harold E. Stassen planned to "dump" Nixon. Soon after the Herter returned from a tour through the far east, Stassen announced on July 23, 1956, that he would support Christian A. Herter (*q.v.*) as a "stronger" vice-presidential nominee. Stassen's anti-Nixon campaign collapsed, however, when Herter himself withdrew it and said that he would present Nixon for nomination at the Republican convention. Nixon was renominated without opposition on the first ballot. (A Nebraska delegate who had originally passed to vote for a mythical "Joe Smith" made the vote unanimous after the roll call.)

Nixon, singled out by the Democrats as "leader of the reactionary wing" of the Republican party, conducted an intensive campaign prior to the national election on Nov. 6, at which President Eisenhower and he were re-elected by landslide proportions.

NLRB: see NATIONAL LABOR RELATIONS BOARD.

Nobel Prizes. The Nobel prizes for literature, physics, chemistry, medicine and peace, first awarded in 1901, were established by the Swedish industrialist, Alfred Bernhard Nobel (1833-96). Each award consists of a gold medal and a sum of money which varies with the income from the \$9,000,000 fund set up by Nobel's will. In 1956 it amounted to \$38,000, for each award, nearly \$2,000 more than in the previous year which had been a record high.

The Nobel peace prize committee announced that it could find no one worthy of its award for 1955 or 1956. The 1955 prize of \$720 was available for belated award in 1956, but since no winner was chosen it would never be awarded. The 1956 award money would be awarded in 1957 if the committee should find a suitable candidate.

Juan Ramón Jiménez, a 74-year-old Spanish-born poet living in Puerto Rico, received the prize in literature for "his lyrical poetry, which in the Spanish language constitutes an example of high spirit and artistical purity."

The 1956 prize in medicine was awarded jointly to two Americans and a German for their work in evolving a simple method of charting the interior of the human heart. The winners were André F. Cournand and Dickinson W. Richards, both of Columbia University, and Werner Forssmann of Bad Kreuznach, German Federal Republic (west Germany).

The chemistry prize was shared by Sir Cyril Hinshelwood, an Oxford University professor, and Nikolai N. Semyonov, director of the Institute of Physics at Moscow, "for their researches into the mechanism of chemical reaction." They were cited as having contributed about equally in showing a quarter of a century ago that molecules, like people, may congregate peaceably or explode in violent chain reactions, depending on their environment and provocation.

Three U.S. physicists divided the year's physics prize, Walter H. Brattain, William B. Shockley and John Bardeen, for their work in inventing and developing a transistor, a tiny and highly efficient substitute for the vacuum tube in electronics. They did their work as research scientists of the Bell Telephone laboratories of Murray Hill, N.J.

The formal presentation of the 1956 prizes was made at the traditional Nobel ceremonies in Stockholm on Dec. 10, the anniversary of Nobel's death.

(See separate article on each recipient.)

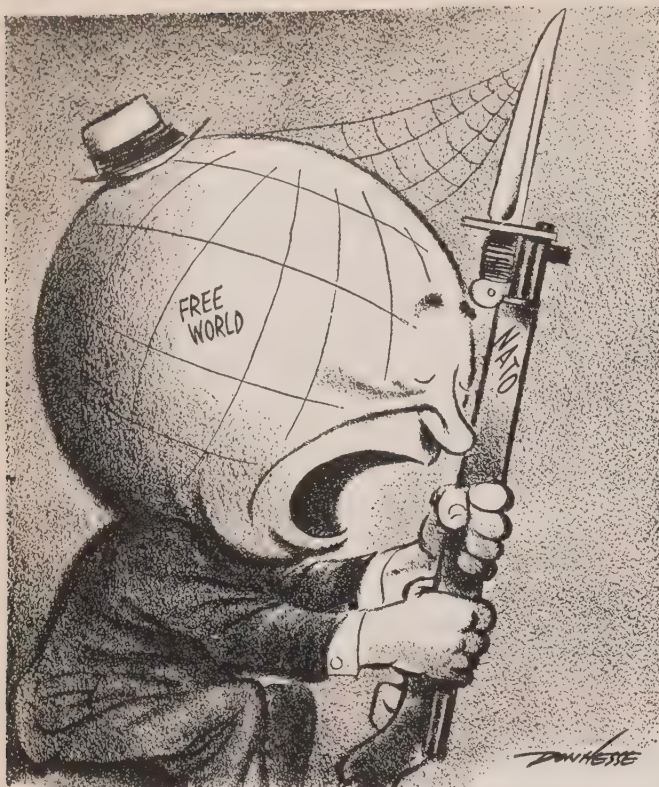
(A. J. RR.)

Norstad, Lauris (1907-), U.S. general, was appointed supreme commander of Allied forces in Europe on April 13, 1956, by the North Atlantic (NATO) council at Paris, Fr., succeeding Gen. Alfred M. Gruenther. Previously Norstad had been deputy air commander for NATO, since 1953; commander of Allied air forces in central Europe (1951-53); and commander of U.S. air forces in Europe (1950-51).

Born at Minneapolis, Minn., on March 24, Norstad graduated from the United States Military Academy at West Point, N.Y., in 1930 as a second lieutenant of cavalry but transferred to the army air corps late the following year. After a series of assignments in Hawaii and the United States he was transferred to Washington, D.C., in 1942 as a member of the officers' advisory group of Gen. Henry H. (Hap) Arnold, commanding general of the U.S. army air force. By Dec. 1943 Norstad was operations director of Allied air forces in the Mediterranean, with the rank of brigadier general. He was then recalled to Washington as deputy chief of the air staff to help plan the latter stages of B-29 saturation bombing on a world-wide scale. As chief of staff of the 20th air force he directed the strategy of the devastating air attacks on Japan in the final months of World War II, including the atomic raids on Hiroshima and Nagasaki. Following the war Norstad became director of plans and operations of the war department's general staff and one of the two army representatives in the negotiations leading to unification of the U.S. armed forces. He was advanced to full general in 1952.

North Atlantic Treaty Organization. The North Atlantic Treaty organization, or NATO, established in 1949, had by 1956 proved its usefulness for the consolidation of the free western world and for the preservation of peace and democracy. Yet in the history of NATO the year 1956 could be characterized as a year of indecision and hesitation.

Problems Faced by NATO.—NATO was established in the period between the Communist coup in Czechoslovakia and the Berlin air lift on the one hand and the Korean war on the other. It was a time of great strain, when military actions by the U.S.S.R. in various parts of the world were expected. NATO was primarily designed to meet this immediate military threat. During 1956 Communist policy appeared to shift from military



"HO-HUM!" a 1956 cartoon by Hesse of the *St. Louis Globe-Democrat* (Mo.)

threats and military aggression to a system of "peaceful" coexistence and economic, political and cultural competition. NATO policy had not yet found time to adapt itself to the new situation. Another factor demanding a readjustment of NATO policy was the increased emphasis on nuclear weapons rather than on conventional weapons. This emphasis seemed to allow a reduction in the number of available trained men put at the immediate disposal of the NATO high command, SHAPE (Supreme Headquarters, Allied powers in Europe). By the end of 1956 the 12 German divisions which had been anticipated for three years had not yet come into existence, and the United States and Great Britain envisaged a reduction of the number of their forces stationed on the continent of Europe.

In addition, many of the French troops under NATO command were transferred to Algeria in an effort to suppress the nationalist uprising there.

Broadening of the NATO Concept.—The deterioration in the general situation of NATO led to a reappraisal of its fundamental policy. The smaller countries within NATO had long desired to have a voice in its diplomatic and military policy, which so far had been shaped largely by decisions taken by the United States, Great Britain and France. The spokesmen for the smaller nations had pointed out that in such decisions the fate of all member nations was inextricably linked and that they must all create policy together, in order to prevent war or to be better prepared for it if it should come. It was not enough, these spokesmen maintained, to work together militarily; it was equally if not more important to show a real solidarity in the political and economic fields. They felt that NATO should be transformed from a mainly military alliance into a new experiment in international relations, in which nations sharing a common heritage of civilization would concert their actions for peaceful development as well as for military contingencies.

The Dec. 1955 Council Meeting.—As a result of these demands for closer co-operation among the members of NATO as envisaged in article 2 of the treaty, the North Atlantic council, meeting in Paris, Fr., on Dec. 15 and 16, 1955, decided to instruct

the permanent council to examine and implement all measures conducive to this end. An initial step, though still confined to the military field, was taken at the council meeting itself, when it was decided to call a special conference for Feb. 1956 at which for the first time the three major nations forming the military standing group of the alliance—the United States, Great Britain and France—would meet with the military and civilian leaders of the other member nations to discuss with them the implications of the "new look" that western strategy was to acquire as a result of new nuclear weapons and guided missiles. The United States government evolved a program which would put its NATO allies on an equal footing in regard to guided missiles, supersonic fighter planes and radar systems, a step equally essential to their military effectiveness and to their morale.

The United States and Europe.—The dissatisfaction of most of the European countries with the restricted scope of NATO activities was expressed by many spokesmen of the smaller European nations. Pres. Giovanni Gronchi of Italy at the time of his visit to North America at the end of Feb. 1956 declared that "unification of the western viewpoint is the indispensable premise for any action in order to confer upon joint policies a dynamic and flexible character to counteract the forces which lately have so ably demonstrated their flexibility."

As a response to this challenge, which emanated from many European members of NATO, the U.S. secretary of state, John Foster Dulles, in an address before the Associated Press on April 23, 1956, espoused for the first time the development of NATO from a military defense alliance into a co-operative enterprise for the political, economic and cultural advancement of its members. But Dulles remained vague in regard to the means and the scope of this extension of NATO functions, and no concrete leadership was given by the United States to put these general observations into the realm of reality. Yet Dulles stressed that this was "the greatest single task" of statesmanship which the western world had faced since the end of World War II.

Hopes were therefore aroused in Europe that NATO could now take on new life and functions and develop into an instrument of a collective western policy, to meet not only the apparently diminishing military dangers but also the growing political and economic threat of Communism. It was hoped that the United States would take the initiative for a common western policy of economic aid to underdeveloped countries, a policy which could develop a similar vigour as the European Recovery program had in saving western Europe from chaos and Communism in the years immediately following World War II.

The Committee of Three.—Conforming to this new trend, the North Atlantic council at its May 1956 meeting appointed a committee of three, consisting of Halvard M. Lange, foreign minister of Norway; Gaetano Martino, foreign minister of Italy; and Lester B. Pearson, Canadian secretary of state for external affairs, for finding ways to ensure western unity and to implement the nonmilitary aspects of the North Atlantic alliance. This committee of three met in June 1956 and again in Sept. 1956 in closed sessions in order to find ways and means to arrange for a more active and much closer consultation among the 15 member nations.

Such closer consultation was made necessary not only by the general international situation but also by two events which concerned NATO directly. One was the announced retirement of Gen. Alfred M. Gruenther, the supreme Allied commander, and his replacement by Gen. Lauris Norstad, U.S.A.F., air deputy to General Gruenther. General Gruenther was widely regarded as one of the strong cohesive forces in the NATO organization, and his departure from SHAPE was deeply regretted. The other

vent had to do with the situation in Iceland.

Iceland and NATO.—How much such closer co-operation outside the purely military field was needed was shown when the parliament of Iceland by a vote of 38 to 18 called for the withdrawal of the U.S. defense forces, stationed, on behalf of NATO, at the Keflavik air base in Iceland, and for the transfer of the base to the care and protection of the Icelanders themselves, who maintained no military establishment. The same resolution of the Icelandic parliament reaffirmed, however, the country's adherence to NATO, of which it was a founder member. On June 22, 1956, Iceland requested the North Atlantic council to survey the situation. The view of the council, transmitted to Iceland and the United States on July 26, stressed the fact that the present international situation "has not improved to such an extent that the defense forces are no longer required in Iceland. Under present circumstances, the withdrawal of United States forces, now in Iceland on behalf of the alliance as a whole, would leave the country completely undefended. A major deterrent to aggression in the North Atlantic area would no longer exist and a gap would be opened in the chain of defense which maintains our security. It is the tangible and visible evidence of forces and installations in being, in place and ready, which constitutes an effective deterrent against aggression. An effective deterrent is our greatest safeguard against the outbreak of war."

U.S. Representation.—On May 9, 1956, Pres. Dwight D. Eisenhower appointed Sen. Walter F. George as U.S. representative with reference to the development of the North Atlantic Community. This appointment was made with the intention to help to explore ways and means by which the North Atlantic Community might more fully realize its potential for the achievement of peace and for the preservation of the great values inherent in western civilization.

Nonmilitary NATO Activities.—The organization of NATO parliamentarians, which started in Paris in 1955, made progress during 1956. The Paris conference in July 1955 had unanimously decided that similar conferences should be held each year, thereby constituting itself a permanent institution. A continuing committee, consisting of one member from each NATO parliament, was set up with a secretariat in London. This committee met and made careful preparations for the 1956 conference to be held in Paris at the end of Nov. 1956, so as to allow the fullest participation of United States parliamentarians. It was agreed that the conference should be broad in its scope and should consider the common problems of the NATO Community in all fields, and the potentialities of NATO, not merely its existing machinery.

The North Atlantic council committee on information and cultural relations called the first conference of cultural experts to a meeting in Paris in July 1956. The meeting was attended by senior officials primarily concerned with government-sponsored cultural activities in the member countries of the Atlantic alliance. They adopted a number of specific recommendations for intensifying cultural exchanges among the countries of the North Atlantic Community.

As a first step NATO established a number of Atlantic fellowships and scholarships.

(See also ARMIES OF THE WORLD; EUROPEAN UNITY; FOREIGN PROGRAMS, U.S.)

(H. Ko.)

North Borneo: see BRITISH BORNEO.

North Carolina. A south Atlantic coast state, popularly known as the "Old North state" or the "Tar Heel state," North Carolina is one of the original 13 states in the union. Area: 52,712 sq.mi. (49,097 sq.mi. land, 3,615 sq.mi. water). Pop. (provisional est., July 1, 1956) 4,423,000;

(1950 census) 4,061,929, of which 1,368,101 (33.7%) were urban, 2,693,828 (66.3%) rural and 1,096,720 (27%) nonwhite. Capital: Raleigh, with pop. (1950) 65,679. Other cities: Charlotte (134,042); Winston-Salem (87,811); Greensboro (74,389); Durham (71,311); Asheville (53,000).

History.—In 1956, North Carolina, like other southern states, faced problems growing out of the 1954 United States supreme court decision declaring the segregation of the races in the public schools unconstitutional. Gov. Luther H. Hodges called the state legislature into special session on July 23 to consider the recommendations of an advisory committee on education under the chairmanship of Thomas J. Pearsall for a constitutional amendment dealing with the public school system. After a brief session, the legislature passed with only a few dissenting votes a proposed constitutional amendment which would (1) permit state and local funds to be spent for private school tuition grants for children whose parents object to their attending integrated public schools; and (2) allow local school units to close public schools by a majority vote if conditions become "intolerable." In a special election held on Sept. 8, the voters in all the state's 100 counties favoured the public school amendment by a total majority of more than four to one, and also approved constitutional amendments changing the meeting date of the legislature from January to February and raising the compensation of legislators.

Thus far there had been no integration of the races in the state's public schools. However, in Sept. 1956 Negroes were admitted to the undergraduate schools of State college in Raleigh and the Woman's college in Greensboro of the University of North Carolina, thereby opening all three institutions of the university to the admission of Negroes (the university at Chapel Hill admitted three undergraduate Negroes in 1955).

Politically, the most significant events were the overwhelming majorities received by Gov. Luther H. Hodges and United States Sen. Samuel J. Ervin, Jr., in the Democratic primary, tantamount to election in strongly Democratic North Carolina. Governor Hodges, who had succeeded to the governorship upon the death of Gov. William B. Umstead in 1954, defeated three opponents, and Senator Ervin, making his first bid for election since his appointment to the senate in 1954, won an easy victory over one opponent.

The new campus of Wake Forest college at Winston-Salem was dedicated on Oct. 12, 1956, thereby consummating the removal of this institution from the town of Wake Forest, where it had been since 1838.

Traditionally Democratic North Carolina cast its 14 electoral votes for Adlai E. Stevenson and Estes Kefauver (although by sharply reduced popular majority), and all Democratic candidates for national and state offices were elected except in the tenth congressional district where incumbent Rep. Charles R. Jonas (Rep.) was returned to office.

The principal state officers in 1956 were Luther H. Hodges, governor; Thad Eure, secretary of state; Henry L. Bridges, auditor; Edwin Gill, treasurer; Charles F. Carroll, superintendent of public instruction; George Patton, attorney general; Wallace Winborne, chief justice; L. Y. Ballentine, commissioner of agriculture; Frank Crane, commissioner of labour; Charles F. Gold, insurance commissioner.

Education.—In 1954-55 there were 2,217 public elementary schools with 24,929 teachers, principals and supervisors, and 785,005 enrolled pupils and 933 high schools with 9,279 teachers, principals and supervisors, and 215,070 enrolled pupils. These schools were operated at a cost of approximately \$155,077,268, including \$7,051,801 of federal funds, \$122,998,428 of state funds and \$24,000,000 of local funds. The average daily attendance in the public schools was 904,029; the number of inhabitants of school age (6-20) was about 1,200,000. The average salary for elementary school teachers was \$3,224 and for high school teachers \$3,397.

Social Insurance and Assistance, Public Welfare and Related Programs.—In June 1956, public grants amounting to \$1,645,348 were made to 51,750 persons for old-age assistance; \$1,237,670 to 19,954 families for aid to dependent children; \$491,378 to 13,094 persons for aid to the permanently

and totally disabled; \$203,524 to 4,932 blind persons; and \$54,761 to 2,493 persons for general relief. For hospitalization of assistance recipients and other indigent persons the total amount expended for June was \$259,932. During the year ending June 1956, the total amount of public relief funds distributed was \$45,743,373, and unemployment benefits amounted to \$22,946,535.

In 1956 the state maintained 18 charitable institutions with 14,600 inmates on June 30 (including 5 correctional institutions); and the state prison system with 10,699 prisoners on July 1, 1956.

Communications.—In 1956 the state highway and public works commission maintained 10,968 mi. of state highways, of which 10,844 mi. were hard-surfaced; 56,053 mi. of rural roads, of which 22,074 mi. were hard-surfaced; and 2,571 mi. of city streets, making a total mileage maintained of 69,592. There were 4,514 mi. of railroads, 870 mi. of city bus routes and 11,912 mi. of passenger bus routes in 1955. There were 114 airports and 6 commercial air lines serving the state. There were 830,000 telephones in use in the state on June 30, 1956.

Banking and Finance.—On June 30, 1956, there were 107 national banks and branches with assets of \$676,169,000 and 446 state banks and branches with deposits of \$1,632,254,000 and assets of \$1,838,836,000. On Jan. 1, 1956, there were 148 building and loan associations operating under state charters with 276,736 members and total assets of \$450,289,911, and 32 federal savings and loan associations with total assets of \$289,849,538. In 1955-56 state receipts were \$1,080,208,512.37; disbursements \$1,074,476,747.08. On June 30, 1956, the state gross bonded debt was \$276,846,000, less bonds invested in sinking funds, \$54,342,659; net bonded debt \$222,503,341. The assessed value of property was \$5,943,198,630 in 1955. In the state and general fund there was a cash balance of approximately \$38,485,550 at the end of the 1956 fiscal year.

Agriculture.—The cash income of North Carolina farmers in 1955 was \$712,502,000 from crops; \$222,963,000 from livestock and livestock prod-

North Dakota. A west north central state of the United States, North Dakota was admitted to the union Nov. 2, 1889; popular name, "Flickertail state." Area: 70,665 sq.mi., including 608 sq.mi. of water. Pop.: (1950) 619,636; (July 1, 1955, est.) 641,000; (July 1, 1956, provisional est.) 657,000. Urban pop. (1950) 26.6%. Capital (1950 pop., with 1955 est. in parentheses), Bismarck, 18,640 (23,300). Chief cities: Fargo, 38,256 (43,700); Grand Forks, 26,836 (30,500); Minot, 22,032.

History.—State officers in 1956 were: governor, Norman Brunsdale; lieutenant governor, C. P. Dahl; secretary of state, Ben Meier; auditor, Berta E. Baker; treasurer, Albert Jacobson; attorney general, Leslie Burgum; commissioner of insurance, A. J. Jensen; commissioner of agriculture and labour, Math Dahl; superintendent of public instruction, M. F. Peterson; tax commissioner, J. Arthur Engen; public service commissioners, Martin Vaaler, Ernest D. Nelson and Anson J. Anderson.

On March 29-30, 1956, the North Dakota Nonpartisan league, for 40 years a faction in the Republican party, moved into the Democratic party and endorsed a slate of candidates and a platform later accepted by the Democratic state convention. The 56,906 Democratic votes in the June 26 primary was the largest primary vote in the party's history, the 103,445 Republican votes the smallest primary vote since 1918. In the primary the voters approved a \$9,000,000 bond issue for Korean veterans, and rejected a \$54,000,000 bond issue for highways.

In spite of a vigorous Nonpartisan League-Democratic campaign, the North Dakota voters on Nov. 6 gave large majorities to Pres. Dwight D. Eisenhower, Sen. Milton R. Young, Representatives Usher L. Burdick and Otto Krueger, Governor-elect John E. Davis, and all Republican candidates for state office except incumbent tax commissioner, J. Arthur Engen. The voters chose a state senate of 34 Republicans, 12 Democrats and 3 undeclared; a house of 94 Republicans and 19 Democrats. They approved a \$1,000,000 loan fund for college students and disapproved a 1955 law prohibiting trading stamps.

Federal funds and projects stimulated the economy of the state. In 1956 construction began on U.S. air force bases at Grand Forks and Minot with appropriations of \$19,752,000 and \$20,181,000. The Garrison dam project was brought to 86% of completion; three 80,000-kw. generators were placed in service; by Oct. 1, 1956, \$252,153,800 had been expended on the project. In 1955 soil conservation districts planted 6,119,000 trees and shrubs, making North Dakota the leader among the Great Plains states. The Tongue river watershed protection program built four dams in 1956.

Education.—Public school teaching positions for the year ending June 30, 1955, were 6,859; public school enrolment 124,608 (elementary 94,832; high school 29,776); schools in session 2,964; average cost per pupil enrolled \$277; average salary of teachers, including city superintendents, \$2,912; total expenditures for public elementary and high schools \$33,423,671. Enrolment in 12 institutions of higher learning with 687 in the faculties totalled 10,666 full-time and 524 part-time students in Oct. 1956. A survey in 1955 showed 18.5% of North Dakotans of age 18-21 enrolled in institutions of higher learning in the state.

Social Insurance and Assistance, Public Welfare and Related Programs.—For the year ending June 30, 1956, public assistance totalled \$10,856,834 (federal 41.7%, state 43.2%, county 15.1%). Old-age assistance cost \$6,751,145 (8,056 persons); aid to dependent children \$2,499,849 (5,062 children); aid to the blind \$83,680 (113 persons); aid to the permanently and totally disabled \$860,050 (934 persons); general assistance \$641,095 (761 cases); administrative expense \$1,036,901. Total expenditures for three charitable and three correctional institutions for fiscal 1956 amounted to \$5,921,206. Number of inmates in Sept. 1956: feeble-minded 1,151; insane 1,853; tubercular 85; penitentiary 213; training school 129; state farm 40.

Communications.—As of Dec. 31, 1954, the highway mileage was: state highways 6,605 mi.; local roads 70,375; prairie trails 39,501. In 1955 the state highway department let contracts for \$15,240,288 of construction. Motor vehicle registration in 1956 to Aug. 31: passenger cars 201,885; trucks 95,469. Six railroads operated 5,259 mi. of track.

Banking and Finance.—On June 30, 1956, the Bank of North Dakota and 115 state banks had resources of \$370,848,277 and deposits of \$337,121,872. Resources of 38 national banks were \$287,259,500, and deposits were \$262,816,500. State treasury collections for the year ending June 30, 1956, were \$90,925,317; disbursements were \$90,361,991. Total bonded indebtedness was \$13,979,250.

Table I.—Production Principal Crops of North Carolina

Crop	Indicated, 1956	1955	Average, 1945-54
Tobacco, lb.	926,825,000	978,775,000	952,680,000
Cotton (500-lb. bales)	340,000	351,000	457,000
Corn, bu.	80,729,000	70,482,000	62,535,000
Hay, all, tons	1,257,000	1,267,000	1,262,000
Peanuts, lb.	303,800,000	204,250,000	286,900,000
Wheat, bu.	9,027,000	6,858,000	7,028,000
Potatoes, sweet, cwt.	2,640,000	2,400,000	2,739,000
Potatoes, Irish, cwt.	2,466,000	3,034,000	3,713,000
Oats, bu.	19,120,000	15,180,000	10,964,000
Soybeans, for beans, bu.	8,316,000	5,068,000	4,049,000
Peaches, bu.	840,000	—	1,559,000
Apples, commercial crop, bu.	1,500,000	40,000	1,239,000
Pecans, lb.	2,600,000	350,000	2,254,000

*Less than 500 bu.

Source: U.S. Department of Agriculture.

Table II.—Value of Products Manufactured by Leading Industries in North Carolina

Product	1955	1954	1953
Textiles	\$2,675,000,000	\$2,430,000,000	\$2,819,000,000
Tobacco	1,623,000,000	1,580,000,000	1,661,000,000
Food	439,000,000	590,000,000	496,000,000
Furniture	326,000,000	295,000,000	332,000,000
Lumber	262,000,000	254,000,000	271,000,000
Chemicals	191,000,000	192,000,000	197,000,000
Paper	175,000,000	192,000,000	194,000,000
Electrical machinery	192,000,000	148,000,000	162,000,000

ucts; and \$7,292,000 from government payments. The average per farm value of the lands and buildings on the 267,906 farms in 1955 was \$8,105, with the average value per acre being about \$128.

Manufacturing.—North Carolina leads the southeast in industrial production and is the nation's largest producer of textile and tobacco products. In recent years chemical, paper manufacturing and electrical machinery have experienced notable growth. In 1955 industrial establishments numbering 7,300 employed 470,000 wage earners at wages of more than \$1,000,000,000. Estimated industrial production in 1955 was more than \$6,482,000,000 and electric power production was 16,791,000,000 kw.hr.

(Jo. C. S.)

Mineral Production.—Table III shows the tonnage and value of those minerals produced in North Carolina in 1953 and 1954 whose value exceeded \$100,000. In 1954 North Carolina was first among the states in output of feldspar and in mica sold or used by producers, second in asbestos,

Table III.—Mineral Production of North Carolina
(Short tons, except as noted)

Mineral	Quantity 1953	Value 1953	Quantity 1954†	Value 1954
Total		\$38,451,000		\$41,651,000
Clays	1,466,000	2,535,000	1,873,000	2,520,000
Feldspar	300,000	3,290,000	258,000	2,221,000
Mica, scrap	57,000	1,429,000	61,000	1,457,000
Sheet (lb.)	619,000	1,308,000	479,000	1,787,000
Sand and gravel	6,911,000	4,993,000	7,441,000	5,508,000
Stone	9,317,000	14,424,000	10,134,000	15,625,000
Talc	119,000	578,000	113,000	388,000
Tungsten concentrates (60% WO ₃)	2,000	*	3,000	*
Other minerals	...	9,894,000	...	12,145,000

*Value included with other minerals.

†Preliminary.

Source: U.S. Bureau of Mines.

third in talc and tungsten and fourth in vermiculite. North Carolina ranked 36th in the value of its mineral output, with 0.3% of the U.S. total.

ENCYCLOPEDIA BRITANNICA FILMS.—*Southeastern States*, 2nd ed. (1956).

Table I.—Leading Agricultural Products of North Dakota

Crop	Estimated 1956	1955	Average, 1945-54
Wheat, bu.	117,600,000	112,942,000	122,990,000
Barley, bu.	31,824,000	31,410,000	24,662,000
Oats, bu.	48,749,000	54,740,000	56,472,000
Rye, bu.	72,521,000	81,698,000	48,386,000
Flax, bu.	4,370,000	9,360,000	3,069,000
Seed, bu.	32,586,000	24,578,000	14,780,000
Hay, cwt.	12,150,000	7,830,000	10,784,000
Alfalfa, tons	4,413,000	4,415,000	3,320,000
Other feeds, tons	420,000	398,000	249,000
Beans, bu.	1,796,000	1,200,000	273,000

Source: U.S. Department of Agriculture.

Table II.—Mineral Production of North Dakota

(In short tons, except as noted)

Mineral	Quantity 1953	Value 1953	Quantity 1954*	Value 1954
Total	2,803,000	\$19,237,000	†	\$15,512,000
Petroleum (bbl.).	5,000,000	10,370,000	6,025,000	12,890,000
Coal and gravel	6,174,000	2,165,000	7,105,000	2,220,000
Iron	35,000	3,000	1,000	4,000
Other minerals . . . . .	...	81,000	...	398,000

*Preliminary.

†Lignite production by states not available.

Source: U.S. Bureau of Mines.

Agriculture.—In 1955 cash farm income totalled \$518,931,000 (71.3% from crops, 27.9% from livestock, 0.8% from government payments), up 14% from 1954 and 8% from 1953. Wheat accounted for 37.6% (32% in 1954) and cattle for 12.8% of the income in 1955. On Sept. 15, 1956, the commodity index of prices received by the farmers of North Dakota stood at 224% (1909-14 base period), the same as a year earlier.

The spring of 1956 began with inadequate moisture in southern and western counties. Hay was short and cattle were thin and ranges in poor condition; new grass made slow growth. In June drought, heat and hail severely damaged crops and grass along the western edge of the state, in southwestern counties and in spotted areas in the southeast. Rains late in July helped, but by October low moisture made the outlook only fair. In the southwestern counties ranchers had reduced their herds in line with supplies. Black stem rust did little damage to wheat, but drought conditions caused crop yields to vary widely over the state. The flax crop was the largest on record and durum wheat (20,848,000 bu.) the largest since 1914.

In 1955 North Dakota co-operatives had 223,618 stockholders, \$109,727,777 worth of assets and transacted \$247,300,000 worth of business. There were among the co-operatives 282 grain elevators, 136 oil companies, 110 credit unions, 27 creameries and 17 stores.

Employment and Business Activity.—Nonagricultural employment in 1956 (January-August) averaged 113,657, or 2.1% above 1955, compared with 1900 in 1939. The increase was largely in construction. Building permits (January-August) were \$31,358,843, compared with \$24,759,151 in the same months of 1955. In 1956 (January-August) manufacturing workers earned \$74.13 a week (\$69.04 in 1955); on July 1 farm labourers averaged \$155 per month with room and board. In 1955 North Dakota retail sales amounted to \$616,439,654, a record. (E. R.N.)

Mineral Production.—Table II shows the tonnage and value of those mineral commodities produced in North Dakota in 1953 and 1954 whose value exceeded \$100,000. North Dakota ranked 43rd among the states in the value of its mineral output in 1954, with 0.11% of the U.S. total.

ENCYCLOPEDIA BRITANNICA FILMS.—*Northwestern States*, 2nd ed. (1946).

Northern Ireland: see GREAT BRITAIN AND NORTHERN IRELAND, UNITED KINGDOM OF.

Northern Rhodesia: see RHODESIA AND NYASALAND, FEDERATION OF.

Northwest Territories. The Northwest Territories comprise all that part of Canada north of the 60th parallel of north latitude, except the portions thereof within the Yukon Territory and the provinces of Quebec and Newfoundland; it also includes the islands in Hudson bay, James bay and Ungava bay, except those within the provinces of Manitoba, Ontario and Quebec. Area: 1,304,903 sq.mi., of which 665 sq.mi. is water; pop. (1951 census) 16,004, including 144 whites, 3,803 Indians and 6,857 Eskimos.

For purposes of organization and administration, the territories were divided by order in council dated March 16, 1918, into the districts of Mackenzie (527,490 sq.mi.), Keewatin (228,000 sq.mi.) and Franklin (549,253 sq.mi.). The Northwest Territories act, 1952, as amended, provides for the government of the territories by a commissioner under instruction given from time to time by the governor in council or the minister of northern affairs and national resources. Legislative powers are in the hands of a council of nine members.

During 1956 the commissioner of the Northwest Territories

was R. G. Robertson, deputy minister of northern affairs and national resources. Appointed members of the legislative council were: F. J. G. Cunningham, deputy commissioner; L. C. Audette; L. H. Nicholson; C. M. Drury; and Jean Boucher. Elected members were: John Parker; Frank Carmichael; Robert Porritt; and J. W. Goodall.

Education.—In 1956 the department of northern affairs and national resources operated federal schools at Fort Smith, Fort Resolution, Fort Simpson, Hay River, Fort Liard, Fort Rae, Fort McPherson, Rocher River, Fort Good Hope, Fort Norman, Fort Franklin, Arctic Red River, Marie River, Lac la Martre, Aklavik, Coppermine, Tuktoyaktuk, New Aklavik, Chesterfield Inlet, Cape Dorset, Frobisher Bay and Pangnirtung on Baffin Island, Coral Harbour on Southampton Island, and also at Fort Chimo and Port Harrison in the province of Quebec. A number of these schools were for Eskimos. A school was operated by the Discovery Yellowknife mines, 60 mi. N. of Yellowknife, and one was also operated by Eldorado Mining and Refining Ltd. at Port Radium. Schools were operated at a number of the settlements by missions of the various churches with financial assistance from the federal government. Yellowknife had the only organized school districts, where a 12-room public and high school and a 5-room separate school were in operation. Correspondence courses were available free of charge to any child whose parents requested them or to any adult who wished to enrol. A vocational training program suitable for residents of the Northwest Territories and special curriculums for use in the Mackenzie district and in Eskimo schools were being developed.

Public Health and Welfare Services.—Schools in most of the settlements are staffed by teachers who assist with welfare needs and organize community recreational programs in addition to their work in the classrooms.

During 1956, 11 hospitals were operated in the Northwest Territories, 8 by missions, 1 by a locally elected hospital board at Yellowknife and 2 by private companies. Eight nursing stations were in operation. Qualifying hospitals and nursing stations received grants from the territorial government.

Under the National Health Grants program, an eyesight survey was continued in the Mackenzie district, while chest X-rays were carried out during the summer months in conjunction with the department of national health and welfare. Tuberculosis treatment, dental services for children in Yellowknife, Fort Smith and Hay River, and treatment of crippled children was provided without charge. Commencing April 1, 1956, free cancer diagnosis, transportation and treatment were provided.

In 1956 approximately 130 persons received old-age assistance and 18 persons received blind persons' allowance. The territorial government and the government of Canada shared the cost of providing allowances up to \$40 a month to residents permanently and totally disabled.

A physician and dentist accompany the annual eastern arctic patrol, treating persons at points of call and visiting many settlements to make physical examinations and X-ray surveys and to administer preventive inoculations.

Transportation and Communications.—A direct inland water transportation route for a distance of about 1,700 mi. is provided by the Athabasca, Slave and Mackenzie river systems. Subsidiary routes on Lake Athabasca, Great Slave lake and Great Bear river and lake total more than 800 mi. The Mackenzie highway, connecting Grimsby, Alta., with Hay River on Great Slave lake, continued to provide service during 1956. Scheduled air mail, passenger and express services were operated throughout the year to most of the settlements in the Mackenzie district.

Radio communications between nearly all settlements and trading posts in the territories and outside points were maintained through government and private radio stations.

Eastern Arctic Patrol.—The 1956 annual eastern arctic patrol carried out by the government ship "C. D. Howe" discharged administrative responsibilities and continued the extensive annual health program. This ship also carried supplies and replacement staffs to eastern arctic settlements, including Royal Canadian Mounted Police detachments, schools, hospitals and nursing stations, trading posts and missions.

Agriculture and Fisheries.—Limited farming and horticultural activity is encouraged and assisted by the department of agriculture, which maintains an experimental substation at Fort Simpson. A limited experiment was being carried out with Eskimos at Fort Chimo to determine the feasibility of growing field and garden crops and raising livestock and poultry.

During the summer season of 1955 and the winter season of 1955-56, commercial fishing on Great Slave lake and other waters in that vicinity produced a total catch of 7,394,000 lb., with a market value of \$1,530,000. Whitefish, lake trout and Inconnu were the principal species taken.

Hunting and Trapping.—Fur production in the territories, during the year ended June 30, 1955, was valued at \$1,166,919 with a total of 477,611 pelts taken during that period. A large part of the catch was muskrats. Trapping remains the principal occupation of the native population.

The herds of caribou continued to be one of the chief food resources for the Indians and Eskimos, and every effort was being made to preserve this resource for the natives.

Five semidomesticated reindeer herds were maintained by the federal government in the Mackenzie delta region for the benefit of the native population; three of the herds were under Eskimo management and one was privately owned. At the reindeer roundups in 1955 there were about 6,502 animals in the five herds. Large buffalo herds were also maintained in Wood Buffalo National park. A limited slaughter of reindeer and buffalo for meat production is carried out annually.

Mineral Production.—Mineral production in the Northwest Territories during 1955 was valued at \$23,450,792, of which pitchblende accounted for \$12,000,000, gold \$10,990,405 and silver \$101,595. Crude oil is produced and refined at Norman Wells on the Mackenzie river, with 1955 production totalling 374,000 bbl. After being processed at the local refinery, the oil was shipped to various points on the Mackenzie river.

(R. G. R.)

ENCYCLOPEDIA BRITANNICA FILMS.—*Prairie Provinces of Canada* (1943).

Norway.

A democratic monarchy of northern Europe, Norway is bounded north by the Arctic ocean, east by Finland, the U.S.S.R. and Sweden, south and west by the North sea. Area 149,284 sq.mi. Pop.: (1950 census) 3,278,546; (1955 est.) 3,441,000. Capital: Oslo; pop. (1950 census) 434,047, (1956 est.) 451,247. Other principal cities (1950 census): Bergen 112,845; Trondheim 56,669; Stavanger 50,647. Religion: Lutheran Christian. Ruler in 1956: King Haakon VII. Prime minister: Einar Gerhardsen.

Spitsbergen (official name, Svalbard), Norwegian since 1925, is an archipelago lying about midway between northern Norway and the north pole. Area: 23,958 sq.mi. Pop. (1950): 3,761, including 1,156 Norwegians and 2,605 Russians.

History.—Industrial production continued to rise and was up, for the first half of 1956, about 5% over the same period in 1955. Export trade for the same six-month period rose 18.5% over 1955, to a total value of kr. 2,513,000,000 (about \$350,000,000); import surplus was cut almost 10%. Imports came chiefly from Great Britain (16%), west Germany (almost 16%) and the United States (12%). The herring catch was the largest ever—1,200,000 tons, for a value of kr. 247,000,000 (about \$35,000,000).

The new passenger ship "Bergensfjord," 18,500 tons, made its maiden voyage to New York city in June. Agreement was signed with Sweden for the modernization of an ancient trade route; wharfage and oil storage was to be built on Trondheim fiord and a good road constructed across the mountains from Trondheim to Ostersund; Sweden would do part of the building and would bear two-thirds of the cost of the highway.

Norway's merchant fleet was second only to that of Great Britain as a user of the Suez canal—in 1954 a total of 1,728 Norwegian ships passed through the canal (18,700,000 gross tons). Norway was therefore intensely interested in the dispute created by Egyptian seizure of the canal.

Relations with the Soviet Union were not easy. In Nov. 1955 Prime Minister Gerhardsen visited Moscow and negotiated a trade treaty providing for kr. 120,000,000 per year of imports from the U.S.S.R., against somewhat larger exports; and preliminary agreement was reached for the department of power resources on the Pasvik river on the northern border between Norway and the U.S.S.R. The most serious incident of the year was the invasion of Norway's coastal fishing waters by Russian trawlers. Sixteen of the vessels were captured and were fined kr. 629,500 (almost \$90,000) for poaching. After initial protest the Russians accepted the verdict and paid the fines.

Representatives of the Lapps held in the summer of 1956 a three-day conference at Karasjok. About 200 were in attendance, including observers from the Scandinavian lands and England, the United States and west Germany. The delegates of the Lapps in Norway, Sweden and Finland (about 20,000 of the total of

approximately 33,000 Lapps live in Norway) agreed to establish a joint Nordic Lapp council, which would have a majority of Lapp members. The purpose would be to study and recommend action on problems such as education and industrial and mining development affecting the adaptation of the Lapps to modern society. (F. D. S.)

Education.—Schools (1952-53): primary 5,470, pupils 355,655, teachers 12,693; secondary 279, pupils 46,296, teachers 2,564; folk high schools 76, pupils 4,199; vocational 477, pupils 38,649; teacher training schools (including vocational and physical education) 19, students 2,882. Institutions of higher education (1953-54) 10, of which 2 universities; university students (spring 1954) 3,785, other students 1,831.

Finance and Banking.—Monetary unit: krone (pl. kroner), with an exchange rate of kr. 7.143 to the U.S. dollar. Budget: (1955-56 approved est.) revenue kr. 4,560,000,000, expenditure (current) kr. 4,037,000,000; (1956-57 est.) revenue kr. 4,947,000,000, expenditure (current) kr. 4,327,000,000. Internal debt (June 1954) kr. 4,549,900,000; external debt kr. 1,420,500,000. Currency circulation: (Feb. 1955) kr. 2,887,000,000; (Feb. 1956) kr. 2,966,000,000. Deposit money: (Feb. 1955) kr. 6,458,000,000; (Feb. 1956) kr. 6,259,000,000. Gold and foreign exchange: (Dec. 1954) U.S. \$190,600,000; (Dec. 1955) U.S. \$225,800,000.

Foreign Trade.—(1955) Imports kr. 7,782,000,000; exports kr. 4,528,000,000. Main sources of imports: U.K. 20%; Sweden 16%; Germany 14%; other continental E.P.U. (European Payments union countries) 20%; U.S. and Canada 13%. Main destinations of exports: U.K. 22%; Germany 11%; Sweden 9%; other continental E.P.U. 22%; U.S. and Canada 10%. Main exports: fish 15%; wood pulp 12%; paper 10%.

Transport and Communications.—Roads (June 1954) 46,810 km. Motor vehicles in use (Dec. 1954): passenger 102,339, commercial 75,780. State railways (1954) 4,492 km.; passenger-km. (June 1953-54) 1,538,000,000; freight, ton-km. (June 1954-55) 1,476,000,000. Shipping: merchant vessels of 100 gross tons and over (July 1955) 2,351; total tonnage 7,249,087; net freight earnings (1955) kr. 2,235,000,000. Air transport (1955): passenger-km. 264,515,000; freight, ton-km. 7,976,000. Telephones (June 1954) 558,074. Radio receiving sets (1954): 925,000.

Agriculture.—Production (metric tons, 1955; 1954 in parentheses): wheat 32,000 (41,000); barley 205,000 (224,000); oats 98,000 (161,000); rye 1,000 (2,000); potatoes 981,000 (1,130,000). Food production (metric tons, 1955): milk (delivered) 1,159,600, butter (factory) 10,560, cheese 28,920; meat (1954): beef and veal 46,000, mutton and lamb 16,000, pork 43,000. Livestock (Sept. 1955): cattle 1,171,000; sheep 1,922,000; horses 150,000; (June 1954) pigs 406,000; goats 123,000. Fish landings (1954) 1,860,000 metric tons. Whale oil production (1954) 177,140 metric tons; value of oil and by-products kr. 248,400,000.

Industry.—Fuel and power (1955): coal 322,800 metric tons; manufactured gas 49,560,000 cu.m.; electricity 22,272,000,000 kw.hr. Production (metric tons, 1955): iron ore (metal content 65%; including ferro-titanium) 1,383,600; pig iron 333,600; crude steel 265,600; zinc (smelter) 44,160; copper (smelter) 13,440; aluminum 77,880; cement 830,400; pyrites (1954) 795,000; nitrogenous fertilizers, N content (1954-55) 194,000; wood pulp (mechanical, 1954) 644,000, (chemical, 1954) 590,000; newsprint (1954) 164,000; other paper (1954) 349,000; sawn softwood (1954) 1,588,000 cu.m.

ENCYCLOPEDIA BRITANNICA FILMS.—Norway (1955); Scandinavia—Norway, Sweden, Denmark (1950); Tale of the Fiords (1955).

Nose and Throat, Diseases of: see EAR, NOSE AND THROAT, DISEASES OF.

Nova Scotia. Second smallest of the Atlantic provinces of Canada, Nova Scotia entered the confederation in 1867. Area: 21,068 sq.mi. Pop.: (1951 census) 642,584; (official est. 1955) 683,000. Capital: Halifax, pop. (1951 census) 85,589.

History.—The Progressive Conservative party, under the leadership of Robert L. Stanfield, defeated the government of Premier Henry D. Hicks in a provincial election on Oct. 30, 1956, ending 23 consecutive years of Liberal party administration in Nova Scotia. Only slight recovery was noted in the declining coal

NORWEGIAN PATROL BOAT (left) closing in on a Soviet fishing trawler off the Norwegian coast near Aalesund, Nor., in Feb. 1956. The Soviet vessel was the fifteenth to be apprehended violating Norwegian territorial rights



industry in the first half of 1956, although economic conditions generally throughout the province gained record levels during 1955 and the early part of 1956. An unusual ice storm in Jan. 1956 caused heavy damage to communications, property, orchards and timberlands, and coupled with subsequent unseasonal rains resulted in further property loss through floods.

A new car ferry service between Yarmouth and Bar Harbor, Me., was inaugurated to promote better communications between the province and the eastern United States. At Baddeck, a museum to commemorate the life and work of Alexander Graham Bell, physician and inventor, was completed and opened to the public.

Education.—Latest available statistics for provincially controlled schools are for 1954 when \$19,145,375 was expended on education. The annual public school enrolment for the term 1954-55 was 151,652 students, with a daily average attendance of 136,496 students. A total of 5,345 teachers were engaged. There were 1,751 rural and village schools with 888 teachers and 250 urban schools with 2,357 teachers.

Public Health and Welfare.—At March 31, 1955, \$1,504,574.90 had been paid in mothers' allowances during the fiscal year to 2,077 persons, while at the same time 5,178 persons were receiving old-age assistance. The total old-age assistance paid during the fiscal year was \$2,128,526.78. Blind pensioners totalled 706, receiving \$330,400.27. Disability pensions were active Jan. 1, 1955, and for the period from January 1 to March 31 of that year, 285 persons received \$24,282.05. On March 31, 1954, there were 3,206 patients registered in 68 public hospitals, while in 1951, 3,140 doctors and nurses, working in 89 hospitals, which had 7,600 beds, provided 871,606 patient days on revenue totalling \$6,159,633.

Transportation and Communications.—In 1954, there were 90,068 passenger automobiles registered. At March 31, 1955, there were 15,139.4 mi. of highways, 1,666.5 mi. of which were paved. In 1951, there were 116,941 telephones in use. In 1953 there were 104,167 radio receiving sets registered, and 9 airports.

Banking and Finance.—At March 31, 1955, the net direct provincial debt, sinking funds, was \$121,011,539.08, while the total direct debt was \$15,327,478. The provincial revenue for the fiscal year ended March 31, 1955, was \$52,915,804.04, while expenditures were \$46,938,708.46. There were six federally chartered banks, with 153 branches, operative in the province at April 30, 1956, and one federal reserve bank (Bank of Canada), Halifax. At Sept. 30, 1954, there were 220 credit unions registered, with membership of 51,952 persons, and total assets of \$7,927,069.37. Only 10 of those chartered were active, and these granted loans totalling \$5,047,301.39. For the fiscal year ended Sept. 30, 1955, there were 218 chartered credit unions, 28 inactive, with assets of \$8,654,478.64 and membership of 51,985, which granted loans totalling \$5,525,364.90.

Agriculture.—Cash income from sale of farm products in 1954 was \$43,100,000 (all figures here, unless otherwise indicated, are official estimates), a higher figure than for the previous year, and gross farm income was \$39,398,000, a lower figure than for 1953. The net income of \$19,912,000 was also lower. The total income from field crops was \$18,233,000 from 18,800 ac. The principal field crops according to income were: hay \$1,195,000, potatoes \$3,421,000, oats \$1,916,000, and roots \$1,152,000. Income from other principal sources were: dairy products \$11,946,000, forest products \$7,260,000, cattle and calves \$5,843,000, eggs \$5,197,000, poultry \$3,863,000, fruits \$2,730,000 and hogs \$2,707,000.

Estimated numbers of livestock on farms at June 1, 1954, were: horses 100,000, cattle 204,000, sheep 99,000, swine 39,000 and poultry 1,707,000. **Fisheries, Furs and Forestry.**—Last available figures on fisheries were for 1953 when the landed value of fish was \$21,410,000. Principal income from forest products in 1954, with quantities marketed in parentheses, were: planks and boards, spruce, \$5,107,743 (71,326 M.B.M. [thousand board measure]); wood pulp mechanically prepared, \$3,526,078 (1,010,000 cwt.), and newsprint, \$18,840,008 (3,138,476 cwt.). The value of furs from animals in captivity at Dec. 31, 1954, was estimated at \$149,780.

Manufacturing.—Factory shipment of manufactured goods during 1954 totalled \$300,073,000 wholesale value, compared with \$320,012,000 in 1953. The gross value of manufactured goods during 1954 was set at \$5,000,000, a lower figure than during the previous two years. In 1951, there were 30,512 employees in 1,474 establishments earning \$63,975,754. **Mining.**—Mineral production for 1955 was approximately \$67,800,000 in value, compared with \$68,000,000 in 1954. Nineteen companies operative in the calendar year 1955 produced 5,730,743 tons of coal, compared with 5,997,761 tons net for the similar period in 1954. Mining of bituminous coal is about 76% of the province's production of mineral wealth, and the industry in 1954 employed a daily average of 10,609 persons. Barytes, 98% of the Canadian production of which comes from the province, totalled 100,300 tons in 1954. Salt totalled 147,457 tons, a record output. The production of gypsum showed an increase over the previous year and the best total to date, at 3,380,669 tons, 80% of the total Canadian production in 1954. (L. S. L.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Maritime Provinces of Canada* (1953).

Nuclear Studies: see ASTRONOMY; PHYSICS.

Nursing. During 1956 congress took action, long urged by organized nursing, to alleviate the critical shortage of supervisory, administrative and nursing education personnel in the United States. Under title II of the Health Amendments Act of 1956, \$2,000,000 was authorized for the 1956-57 fiscal

year for advanced preparation of professional nurses for positions in these areas. The Health Amendments act also provided for traineeships in graduate or specialized public health training for professional public health personnel, including nurses, and for grants to states to expand and improve practical nurse training under vocational education.

Beginning in 1955 and continuing through 1956 the National League for Nursing made available, through a grant from the Commonwealth fund, a limited number of fellowships for master's and doctoral study to nurses with the highest potential for leadership in administration, research, supervision and teaching. By Nov. 1956, 29 doctoral and 13 master's awards had been made.

In its first year of operation the American Nurses' Foundation, Inc., made seven grants for research studies of nursing functions. The foundation was continuing and expanding the program of nursing research which had been conducted since 1950 by the American Nurses' association. A preliminary report on studies of nursing functions conducted in 17 states was released at the American Nurses' association convention in Chicago, Ill., in May.

The National Institutes of Health made a grant to the American Nurses' foundation for a study of public health nursing. This study was the only one being conducted by the foundation staff itself. It was started in agencies in New York and New Jersey and was to be extended to the south or west.

The U.S. public health service again made available \$625,000 for research grants and fellowships in nursing. These funds were for the fiscal year which began July 1, 1956.

Statements of functions, standards and qualifications for practice in various areas of nursing were approved at the convention in 1956. These statements, in preparation since 1952, were designed to serve as guides in the more efficient use of nursing skills. Nurses throughout the country assisted in their preparation. The statements were to be revised as needed to keep them abreast of changing practice.

During 1956 the National League for Nursing placed increased emphasis on efforts to meet the need for adequate nursing care for the mentally ill. A series of five regional conferences and one national conference were held to discuss preparation of graduate psychiatric nurse specialists.

Activities designed to help hospitals and nursing homes improve the care of patients through better utilization of existing personnel were continued. Regional institutes were held for teacher-trainers, who in turn conducted workshops for nurses assigned by hospitals to train nursing aides. Nearly 100,000 nursing aides employed by participating hospitals had been reached through the teacher-trainer program.

A nation-wide conference was held in 1956 to promote better referral of patients from hospitals to homes so that persons, wherever they may be, might receive the nursing care they need.

A national inventory of professional registered nurses was to be conducted in 1957-58. Rapid progress with plans for the inventory was made possible by widespread adoption of a new registration form for use by state boards of nursing. The new form greatly facilitated the collection throughout the country of uniform data regarding nursing.

New data on earnings, hours and other employment conditions of hospital nurses were collected by the bureau of labour statistics. The bureau surveyed various categories of hospital employees, nonprofessional as well as professional, in representative hospitals in approximately 20 urban areas throughout the country. This was the first time that nurses' salaries and employment conditions had been studied in this way. (See also WORLD HEALTH ORGANIZATION.) (V. L. BT.; J. L. CN.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Home Nursing* (1941).

Nutrition, Experimental. Dietary Fat and Blood Lipids.

Many investigators had associated high plasma lipid (blood fat) levels with atherosclerosis (abnormal thickening and hardening of the walls of the arteries). Therefore, any dietary factor that controls these plasma components might be of great importance.

J. M. R. Beveridge and his associates studied the effects of cholesterol and animal and vegetable fats incorporated into homogeneous formula diets on plasma lipids. Five healthy men, aged 33 to 41 years, consumed alternately their customary diets and homogenized "formula" diets. The formula diets varied both in cholesterol content and in the amount and type of fat. Blood samples were taken throughout the study, and the plasma was analyzed for lipid values.

Each subject ate his customary diet ("rest" diet) for a preliminary period of 14 days. For the next 12 days the subjects were fed formula diets with 28.4% of the total calories supplied by vegetable fat (corn oil). Following another 14-day period on their customary diets, the subjects were fed the same formula diet with the inclusion of cholesterol (200 mg. per 950 cal.) for 11 days. The subjects then returned to their customary diets for two weeks. For the next 11 days they consumed a formula diet with vegetable fat increased to supply 58.5% of the total calories. The next rest period was followed by an 11-day period of formula feeding in which the high vegetable fat diet was replaced by a similar diet which supplied 58.5% of its total calories in the form of butterfat. Following a final rest period, the subjects were fed a high vegetable fat diet supplemented with an amount of cholesterol equal to that contained in the butter diet for 11 days.

The diets containing vegetable fat, with or without supplementary cholesterol, led to decreases in plasma lipid levels. When the subjects were on their customary diets, the lower plasma cholesterol levels that followed the consumption of the vegetable fat formulas returned to pre-experimental levels. Thus, the same levels were present before each experimental period. When butterfat was included in the formula diet, the plasma cholesterol increased on the fourth and seventh days and then returned to initial levels.

The authors concluded that under the conditions of this study there was a highly significant statistical difference between the effects of vegetable fat and animal fat on the blood lipids. The decrease in plasma lipids appeared to be a real effect associated with the diet containing vegetable fats. This effect was not observed when butterfat supplied the dietary fat.

Diet and Serum Cholesterol.—High levels of fat and cholesterol in the blood had been associated with atherosclerosis. It was believed that the concentration of cholesterol in the blood might be affected by various components of the diet.

A. Keys and co-workers studied the effect of dietary cholesterol on blood cholesterol levels in a series of experiments. No relationship between dietary cholesterol and the total amount of cholesterol in the blood was observed in two cross-sectional surveys in Minnesota on young men and four surveys on older men. In two surveys in Sardinia no differences were observed in the serum (blood) cholesterol concentrations of men of the same age, physical activity and relative body weight. Although their general dietary patterns were similar, their cholesterol intakes differed markedly.

In another study, two groups of men of similar age and economic status were studied over a four-year period. The diets of one group of 33 men were consistently low in cholesterol, while the diets of 35 men in the second group were consistently high. No differences were noted in the blood cholesterol levels of these two groups.

In still another experiment, comparisons of blood cholesterol

levels were made of 23 men before and after they had doubled their cholesterol intakes and of 41 men who cut their cholesterol intakes by 50%. No changes in blood cholesterol levels were noted in either group.

After these and several other experiments, it was concluded that the blood cholesterol level in an adult man was essentially independent of the cholesterol in his diet.

Obesity and Physical Activity.—M. L. Johnson and associates studied the relative importance of inactivity and overeating on energy balance in high school girls. These workers compared the food intake and activity of 28 obese and 28 non-obese girls of similar height, age and grade.

Both groups were found to be relatively inactive; 90% of the obese girls' time and 85% of the nonobese group's time was spent in sleeping, lying still or sitting. The nonobese group, however, participated in active sports and other strenuous activities to a much greater extent than the obese group.

Caloric intake of the obese group was significantly lower than that of the nonobese group. Caloric intake and activity were compared for each group to determine the important factor in the development and maintenance of obesity. On a statistical basis, it appeared that inactivity was much more important than overeating in weight gain. Thus, inactivity might be a major factor in the increased incidence of obesity.

Fertilizers and the Nutritional Value of Foods.—The influence of soil improvement on human health by its possible effect on the nutritional composition of plants and animal products has been a subject of much research. This subject was pursued in a ten-year study undertaken by Michigan State college (now Michigan State university, East Lansing) in 1945. The effects of soil fertility on crop quality, animal nutrition and the nutritional value of animal products were observed. In one experiment, two herds of dairy cattle were maintained on feed produced at an experimental farm. Twenty cows were fed rations produced on soil of low fertility, and 16 were fed rations produced on fertilized soil. Careful records were kept of the health of the animals in the herds, their milk production, efficiency of the milk production and the composition and nutritive value of the milk.

The researchers found that the principal effect of soil improvement was to increase the yield of crops; little difference in the composition of the crops produced on the fertilized and on the unfertilized soils was noted. Furthermore, animals consuming crops produced under the two soil fertility levels did not differ in their health or in their milk production. Although some variations in the chemical composition of the milk produced were observed, none of these differences in composition was related to differences in the feed sources. Thus feed produced on low-fertility soil did not have a detrimental effect on the milk produced. The results of this experiment therefore pointed out that soil fertilization affected yield rather than the nutritional quality of the crop.

In the Michigan State university experiment, commercial fertilizers were used almost exclusively. The efficacy of such inorganic fertilizers in contrast with organic sources of fertilizing elements, such as compost and manure, had long been questioned. Claims had been made that the organic sources were superior to the inorganic sources. In addition, some reports stated that the extensive use of inorganic fertilizers had resulted in a decline in the nutritional quality of present-day food supplies.

L. A. Maynard reported that the results of many observations did not substantiate these claims. In one experiment, the nutrient composition of potatoes and seedling rye grown on soil fertilized with manure for a period of 25 years was compared with similar crops grown on soil treated with inorganic fertilizers for the same period of time. No difference in the vitamin C, iron and copper content of potatoes grown on the two soils was observed. Like-

wise, the vitamin C and carotene content of the rye grown on soil treated with organic fertilizers was the same as that in rye raised on soil fertilized with inorganic elements.

These experiments did not substantiate the claims that the use of inorganic fertilizers devitalizes soil and reduces the nutritive value of food supplies. They did indicate that soil fertilization does increase crop yield and thereby affects health by increasing food supplies.

(See also VITAMINS AND NUTRITION.)

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ENCYCLOPEDIA BRITANNICA FILMS.—*Food and Nutrition* (1939); *Obesity* (1952); *Understanding Vitamins* (1952).

Nuts. Tree nut production in 1956 in the U.S. was about 211,000 tons, 6% larger than in 1955 and 9% above average. Included were a record almond crop, an above average pecan crop, a smaller walnut crop than in 1955 and a filbert crop only one-third as large as in 1955. Carry-over stocks were low, except for pecans. Imports of tree nuts during 1955-56 totalled about 15,000 tons, approximately equal to domestic production, but only 12% consisted of the four major types produced domestically.

The pecan crop was indicated at 160,700,000 lb. as compared with 147,860,000 lb. in 1955 and an average for 1945-54 of 137,880,000 lb. Prices were sharply lower than the record 40.9 cents per pound obtained for improved varieties and 29.6 cents per pound for seedlings received for the 1955 crop.

The U.S. crop of Persian (English) walnuts, produced largely in California, was 72,000 tons as compared with 77,400 tons in 1955 and an average for the previous decade of 73,670 tons. Though smaller imports were anticipated in 1956-57, prices were expected to average below the \$561 per ton received for the 1955 crop.

Production of 84,300 tons of walnuts in other countries was the largest since 1931; Italy produced 55,000 tons as compared with a previous record in 1955 of 29,000 tons.

The California almond crop was a record large one of 51,000 tons, 33% larger than the 38,300 tons of 1955 and 30% above the average for 1945-54 of 39,330 tons. Prices dropped below the high average price of \$861 per ton received for the 1955 crop. The important Mediterranean basin almond crop was greatly damaged by cold. An indicated 40,200 tons (shelled) in 1956 was a record low, about half the average crop of 80,700 tons.

The 1956 U.S. filbert crop from Oregon and Washington, badly damaged by a winter freeze, was the smallest since 1940, 3,035 tons as compared with 7,710 tons in 1955 and an average crop of 7,837 tons. Prices were higher than the average \$420 per ton received for the 1955 crop, and larger imports were in prospect for 1956-57.

The foreign commercial filbert crop was estimated at near 13,500 tons (unshelled) as compared with 119,000 tons in 1955 and an average (1949-53) of 113,200 tons. Turkish commercial production of filberts was estimated at a record 150,000 tons, exceeding the previous 1954 record of 135,000 tons and much in excess of the small 1955 crop of 57,000 tons.

Production of Brazil nuts was indicated at a record 41,000 tons as compared with 38,500 tons in 1955 and an average of 31,000 tons for 1949-53. India, producing as many as 60,000 tons of cashew nuts per year, planted to reach a goal of 80,000 tons by 1960. The pistachio nut crop of Turkey was estimated

at 9,500 tons, 1,000 tons larger than in 1955.

(See also PEANUTS.)

(J. K. R.)

Nyasaland: see RHODESIA AND NYASALAND, FEDERATION OF.

Oats. The 1956 U.S. oat crop of 1,154,595,000 bu. was the second smallest since 1945, 23% less than the record crop of 1955 and 13% below average. Planting intentions in March of 46,063,000 ac., 4% less than 1955, were further reduced by both drought and excessive rainfall, but more especially by some destruction of the growing crop to qualify acreage for the soil bank program. The 35,427,000 ac. harvested were nearly 10% fewer than in 1955 and less than the 1945-54 average of 38,912,000 ac. Average yield was 32.6 bu. per acre as compared with the record 38.3 bu. per acre in 1955 and the 1945-54 average of 34.1 bu. per acre. Minnesota with 171,017,000 bu. displaced Iowa (144,585,000 bu.) as the leading producer, followed by Illinois (139,886,000 bu.) and Wisconsin (129,122,000 bu.).

Table I.—U.S. Oat Crops

Item	Indicated 1956	1955	Average, 1945-54
Total production (thousands of bushels)	1,154,595	1,499,282	1,327,496
Acreage harvested (thousands)	35,427	39,138	38,912
Yields (bushels per acre)	32.6	38.3	34.1

A record high carry-over on July 1 of 347,000,000 bu., plus the new crop, provided a total supply about 303,000,000 bu. less than the 1,805,000,000 bu. record high oat supply of 1955-56. Prices to producers rose, contrary to the usual seasonal trend, from about 62 cents per bushel in the late spring to 69 cents per bushel in October. The official support price on the 1956 crop, lowered to 59 cents per bushel (70% of parity), as compared with 61 cents per bushel on the 1955 crop, was later increased to 65 cents (76% of parity). Imports of about 20,000,000 bu. from Canada were anticipated in 1956-57, as compared with 3,000,000 bu. in the previous year.

Table II.—Oat Production of the Principal Producing Countries

Country	(In thousands of bushels) Indicated 1956	1955	Average, 1945-49	Average, 1935-39
United States	1,154,595	1,499,282	1,376,527	1,045,329
U.S.S.R. . . . .	...	...	720,000	1,165,000
Canada	535,000	403,835	326,437	338,071
France	275,580	250,770	221,821	329,304
United Kingdom	178,570	189,630	204,692	138,628
Western Germany	163,280	170,680	144,500	194,500
Sweden	72,890	41,130	58,000	87,198
Finland	61,000	47,000	35,275	45,000
Denmark	58,150	59,450	67,820	70,205
Argentina . . . . .	...	49,810	49,310	50,182
Australia . . . . .	...	70,630	33,249	23,351

World oat production of 4,250,000,000 bu. was smaller than the 4,435,000,000 bu. in 1955 or the 4,367,000,000-bu. average prewar crop but above the 3,920,000,000-bu. average for 1945-49. The 127,190,000 ac. harvested was slightly more than the 126,970,000 ac. in 1955 but far less than the 144,010,000-ac. average for 1935-39. The U.S. accounted for most of the decline; western Europe had a somewhat larger crop than in 1955, and Canada's crop was the largest since the record one of 1942.

Oat stocks on July 1 in the principal exporting countries were 562,000,000 bu. as compared with 460,000,000 bu. a year earlier and the 407,000,000-bu. average for 1945-49. (J. K. R.)

Obituaries. The following is a selected list of prominent men and women of the United States and other countries, who died during the year 1956:

Abbott, Allan, U.S. educator (b. Brooklyn, N.Y., Feb. 15, 1876—d. New York N.Y., March 21, 1956).
Adams, Earl Frederick, U.S. Baptist clergyman (b. Palmyra, N.Y., May 28, 1900—d. Washington, D.C., Nov. 1, 1956).

Adams, Walter Sydney, U.S. astronomer (b. Antioch, Syr., Dec. 20, 1876—d. Pasadena, Calif., May 10, 1956).

Alexander, Will Winton, U.S. government official and clergyman (b. Morrisville, Mo., July 15, 1884—d. Chapel Hill, N.C., Jan. 13, 1956).

Allen, Fred (JOHN FLORENCE SULLIVAN), U.S. humorist (b. Cambridge, Mass., May 31, 1894—d. New York, N.Y., March 17, 1956), entertained a generation of radio (and later television) audiences from the time of his debut on the air in Oct. 1932. Starting in vaudeville as a juggler and humorist, he toured the U.S. and Australia. Later he switched to humour alone. He played in several successful Broadway musical comedies and in such motion pictures as *Thanks a Million* and *Love Thy Neighbor*. Allen and his wife Portland gained fame in their weekly radio program "Allen's Alley," which had an estimated 20,000,000 listeners at the height of its popularity. Allen was a dead-pan humorist, specializing in ad lib remarks and trenchant comments on current affairs. He wrote *Treadmill to Oblivion*, published in 1954.

Althouse, John George, Canadian educator (b. Ailsa Craig, Ont., 1889—d. Toronto, Ont., Aug. 2, 1956).

Ambedkar, Bhimrao Ramji, Indian statesman (b. Ratnagiri, Bombay, April 11, 1893—d. New Delhi, Dec. 6, 1956), devoted his life to the welfare of the people of the depressed classes or the scheduled castes as they later became known. In early life he had personally suffered the humiliations and handicaps of untouchability but through the enlightened intervention of the Maharajah Gaekwar of Baroda he was granted a scholarship which enabled him to study in the United States, Germany and Great Britain. On returning to India he settled in Bombay where he practised as a barrister in the high court, becoming also professor of political economy at Sydenham college. He quickly and permanently established himself as the undisputed leader of the depressed classes, creating trade unions, an Independent Labour party and a weekly newspaper as instruments of policy. He was nominated to represent his people in the Bombay legislative assembly. Ambedkar participated in the round table conferences in London during 1930-32 and served on the joint parliamentary committee (1932) which paved the way for the Government of India act, 1935. During the discussions he had clashed with M. K. Gandhi by urging separate representation in the assemblies for the depressed classes; after bitter controversy he came to a reluctant compromise. His book *What Congress and Gandhi Have Done to the Untouchables* was published in 1940. After 1940 he occupied several important posts, particularly that of minister of law (1948-51) in the government of India, which involved preparation of the draft constitution and superintending its passage through the constituent assembly. He resigned this appointment in 1951 and shortly before his death was converted to Buddhism.

Amoss, Harold Lindsay, U.S. physician and educator (b. Cobb, Ky., Sept. 8, 1886—d. Greenwich, Conn., Nov. 2, 1956).

Anderson, Karl, U.S. artist (b. Oxford, O., Jan. 13, 1874—d. Westport, Conn., May 18, 1956).

Andrews, John Miller, Irish statesman (b. Ardara, Comber, Ire., July 17, 1871—d. Comber, Aug. 5, 1956).

Arlen, Michael (DIKRAN KOUYUMDJIAN), Bulgarian-British author (b. Roustchouk, Bulg., Nov. 16, 1895—d. New York, N.Y., June 23, 1956), acquired fleeting literary fame with his novel, *The Green Hat* (1924), a best-seller later adapted by Arlen as a play. The play, starring Katharine Cornell, was a great Broadway success and the basis for two subsequent motion pictures, *Woman of Affairs* (1929) and *Outcast Lady* (1934). Arlen, who became a British citizen in 1922, wrote a dozen other novels and several scenarios for motion pictures.

Arnold, Edward (GUENTHER SCHNEIDER), U.S. motion-picture actor (b. New York, N.Y., Feb. 18, 1890—d. Encino, Calif., April 26, 1956), joined a stock company at Trenton, N.J., in his teens and subsequently rose to become one of the leading U.S. male motion-picture character actors. One of the relatively few silent film actors to make the successful transition to sound pictures, Arnold starred in such diverse roles as those of king (Louis XIII in *Cardinal Richelieu*); senator (*Jennie Gerhardt*); millionaire (Diamond Jim Brady in *Diamond Jim and Lillian Russell*, John Sutter in *Sutter's Gold*); gangster (*Whistling in the Dark*); and priest (*White Sister*). Arnold had lead parts in several Broadway plays and frequently appeared in radio and television shows, notably the "Mr. President" radio series.

Atkins, Gaius Glenn, U.S. educator and Congregational clergyman (b. Mount Carmel, Ind., Oct. 4, 1868—d. Bethlehem, Pa., April 5, 1956).

Atterbury, Grosvenor, U.S. architect (b. Detroit, Mich., July 7, 1869—d. Southampton, N.Y., Oct. 18, 1956).

Atwood, Harrison, U.S. advertising executive (b. Auburn, Me., Sept. 30, 1886—d. New York, N.Y., Nov. 22, 1956).

Aubrey, Edwin Ewart, U.S. theologian (b. Glasgow, Scot., March 19, 1896—d. Philadelphia, Pa., Sept. 10, 1956).

Aydelotte, Frank, U.S. educator (b. Sullivan, Ind., Oct. 16, 1880—d. Princeton, N.J., Dec. 17, 1956), was president of Swarthmore college at Swarthmore, Pa., from 1921 to 1940 and director of the Institute for Advanced Study at Princeton, N.J., from 1939 to 1947; he was also U.S. secretary of the Rhodes scholarships trustees from 1918 to 1953. Himself a Rhodes scholar at Oxford (1905-07), he had taken his bachelor's degree at Indiana

university in 1900 and his master's at Harvard in 1903. Prior to becoming head of Swarthmore he taught English at Massachusetts Institute of Technology from 1915 to 1921.

Bacharach, Isaac, U.S. public official (b. Philadelphia, Pa., Jan. 5, 1870—d. Atlantic City, N.J., Sept. 5, 1956).

Bacon, (Yvonne) Faith (MRS. SANFORD DICKINSON), U.S. dancer (b. 1910?—d. Chicago, Ill., Sept. 26, 1956).

Badoglio, Pietro, Italian army officer (b. Grazzano Piedmont, It., Sept. 28, 1871—d. Grazzano, Oct. 31, 1956), conquered Ethiopia and engineered the downfall of Mussolini. He studied at the Turin cadet school and, as an artillery officer, first saw active service in the disastrous Italo-Ethiopian war of 1896-97. In 1911-12, as a captain, he fought in Tripolitania. From World War I he emerged as a general and chief of staff of the commander in chief. After the war he was created a senator (Feb. 1919) and up to 1921 served as chief of the general staff of the army. As he did not support Fascist policy he was sent by Mussolini as ambassador to Brazil (1924-25). In June 1925, however, he was made marshal of Italy and soon resumed the post of chief of the general staff of the armed forces. In 1928 he was made Marchese del Sabotino and appointed governor of Libya (1928-33). In Nov. 1935 he assumed the high command of the Italian expeditionary force in Ethiopia and on May 5, 1936, entered Addis Ababa. He was made duke of Addis Ababa and for a short time acted as viceroy of Ethiopia. In Nov. 1939 Badoglio was reappointed chief of the general staff, resigning on Dec. 6, 1940, as a protest against Mussolini's aggression against Greece. On July 25, 1943, having played an important part in overthrowing Mussolini, Badoglio succeeded him as prime minister. On Sept. 8, 1943, he announced that five days earlier Italy had signed the Allies' unconditional surrender terms, and on Oct. 13 he declared war on Germany. After the liberation of Rome he resigned as prime minister (June 18, 1944).

Balendonck, Armand (Edouard), U.S. composer and violinist (b. Liege, Belg., Aug. 9, 1893—d. New York, N.Y., June 27, 1956).

Ball, Stanley Crittenden, U.S. zoologist (b. Shelburne Falls, Mass., Nov. 19, 1885—d. New Haven, Conn., Aug. 9, 1956).

Ballin, Hugo, U.S. painter and motion-picture producer (b. New York, N.Y.—d. Santa Monica, Calif., Nov. 27, 1956).

Bancroft, George, U.S. actor (b. Philadelphia, Pa., Sept. 30, 1882—d. Santa Monica, Calif., Oct. 2, 1956).

Barkley, Alben William, U.S. vice-president from 1949 to 1953 (b. Graves county, Ky., Nov. 24, 1877—d. Lexington, Va., April 30, 1956), was a leading Democratic political figure of the New Deal and Fair Deal eras. (For his early career, see *Encyclopaedia Britannica*.) He served six terms in the U.S. house of representatives (1913-1927, 1st Kentucky district), then was elected to four terms as senator from Kentucky. As majority leader of the senate from 1937 to 1947 Barkley exercised undeviating loyalty to Franklin D. Roosevelt and Harry S. Truman, with one notable exception. That was in Feb. 1944 when he denounced Pres. Roosevelt's veto of a tax bill and resigned the majority leadership in protest. The senate immediately re-elected him, however, and he accepted. In 1948 he was nominated for the vice-presidency by the Democratic party and was elected with Truman the following November, receiving a large share of credit for the unexpected Democratic victory of that year. When Truman announced that he would not run for re-election in 1952, Barkley became a leading candidate for the presidential nomination. But his chances were dealt a mortal blow, shortly before the Democratic convention met in Chicago, by leaders of the American Federation of Labor and the Congress of Industrial Organizations, who rejected him because of his age (he was then 74). In the campaign, Barkley actively supported the Democratic nominee, Adlai E. Stevenson. Meanwhile, his marriage to Mrs. Carleton S. Hadley was a news event of 1949 that captured national attention (Barkley's first wife had died in 1947). In 1954 he ran again for the U.S. senate, winning by a substantial margin and taking office the following Jan. 5 amid a standing ovation in the senate. Barkley was one of the most effective political orators of his time, rarely speaking from text or notes and almost always with anecdotal wit. He was addressing a mock political convention of Washington and Lee university students when he was stricken with a fatal heart attack.

Barnes, Alfred Edward, British physician and educator (b. Sheffield, Eng., June 3, 1881—d. Helensburgh, Oct. 23, 1956).

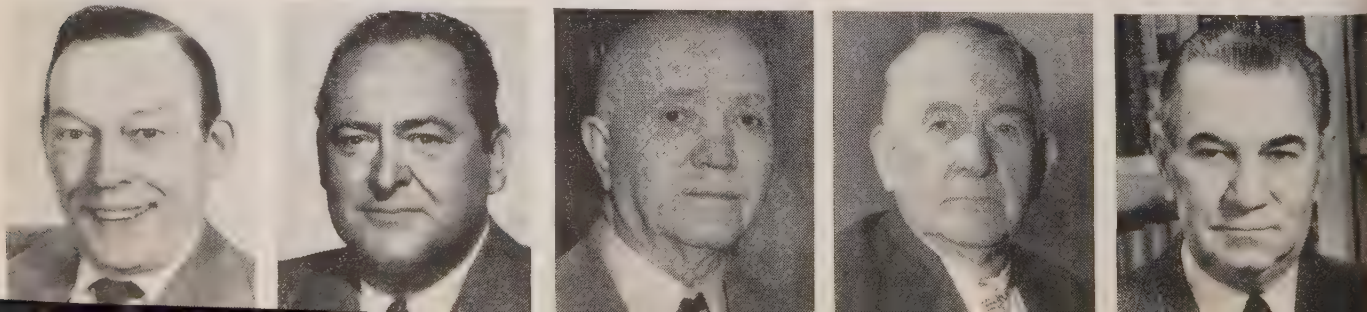
Baroja y Nessi, Pio, Spanish novelist (b. San Sebastian, Sp., Dec. 28, 1872—d. Madrid, Oct. 30, 1956).

Baum, Walter Emerson, U.S. artist and author (b. Sellersville, Pa., Dec. 14, 1884—d. Sellersville, July 12, 1956).

Beach, Chester, U.S. sculptor (b. San Francisco, Calif., May 23, 1881—d. Brewster, N.Y., Aug. 6, 1956).

Beal, Gifford Reynolds, U.S. painter (b. New York, N.Y., Jan. 24, 1879—d. New York, N.Y., Feb. 5, 1956), a leading U.S. landscape artist of his time, won more than 25 medals in major competitions. His favourite subjects were the New England coast, circus figures and semirealistic landscapes in which colour was made subordinate to design. Beal received his B.A. from Princeton university in 1900 and studied art in New York city. Among his

1956 OBITUARIES: Fred Allen, U.S. comedian; Edward Arnold, U.S. actor; Pietro Badoglio, Italian marshal; Alben W. Barkley, U.S. public official; Lawrence D. Bell, U.S. aircraft manufacturer



best-known paintings are "Across the Valley" and "Albany Boat" in the Metropolitan Museum of Art, New York city, and "Puff of Smoke" in the Art Institute of Chicago.

Beerbohm, Sir Max, British writer and caricaturist (b. London, Aug. 24, 1872—d. Rapallo, It., May 20, 1956), the son of a merchant of Baltic origin and half-brother of Sir Herbert Beerbohm Tree, Henry Maximilian Beerbohm was educated at Charterhouse and at Merton college, Oxford, where he soon became a "long-established" writer who issued in one volume *The Works of Max Beerbohm* (1896), complete with "bibliography." In 1896 he succeeded Bernard Shaw as dramatic critic for the *Saturday Review* where he remained until 1910. In that year he retired to Rapallo in Italy after his marriage to the U.S. actress Florence Kahn (d. 1951). He returned to England during World Wars I and II and was knighted in 1939. A month before his death he married Elisabeth Jungmann, his housekeeper who had tended him in his last days. Beerbohm was a caricaturist of unerring aptness. *Caricatures of Twenty-five Gentlemen*, collected in 1896, showed the limitations as well as the strength of his draftsman's hand. His targets, whether royal or literary, were tellingly hit, but he was never in bad taste. It was sometimes suggested that the "Incomparable Max," as Shaw dubbed him, gained through his wit and fastidious performance a reputation not commensurate with a tiny output. Yet his writings on the theatre to 1924 filled nearly 600 pages. He wrote many essays as well as a famous series of stories varying in tone from *The Happy Hypocrite* (1897) to the gentle and serious *William and Mary* (1921). His novel *Zuleika Dobson* (1911) was perhaps the least controlled of his works. In *A Christmas Garland* (1912) was gathered a collection of parodies of Henry James, Rudyard Kipling, Thomas Hardy (with an unsolicited sequence to *The Dynasts*), Arnold Bennett and others. His wittiness and readability were unquestionable, although sometimes his style had a subtle wilfulness which would have been intolerable in other writers. (See also *Encyclopædia Britannica*.)

Hill, Lawrence Dale, U.S. aircraft designer and manufacturer (b. Mentone, Ind., April 5, 1894—d. Buffalo, N.Y., Oct. 20, 1956), directed the designing of some of the best-known U.S. fighter planes, including the single-engine P-39 Airacobra and the P-63 Kingcobra of World War II; the P-59 (first U.S. jet plane) and the experimental rocket-propelled X-2. The latter established a new air speed record of 1,900 m.p.h. in July 1956 and attained an altitude of 126,000 ft. two months later. After working as a designer and executive for aircraft companies Bell organized (1935) his own company, the Bell Aircraft corporation, in Buffalo, N.Y., which produced military planes, guided missiles, aircraft parts and turned out the first helicopter to receive a commercial licence. Bell received the Collier aviation trophy for developing the Bell X-1, a tiny rocket-powered plane which in 1947 attained supersonic speed.

Blaman, Katherine Jones, U.S. author (b. Carthage, Miss.—d. Jackson, Miss., Nov. 8, 1956).

Bellamy, Paul, U.S. newspaperman (b. Chicopee Falls, Mass., Dec. 26, 1884—d. Bratenahl, O., April 12, 1956), was editor of the *Cleveland Plain Dealer* from 1933 to 1953. A graduate of Harvard (1905), he worked for two years as a cub reporter for the *Springfield* (Mass.) *Union* before moving to Cleveland. An idealist in the footsteps of his father Edward Bellamy, author of the utopian *Looking Backward* (1888), he strove to improve the quality of news coverage and interpretation and vigorously defended criticism of the U.S. press as essential to its good reputation. Prior to his appointment as editor of the *Plain Dealer*, Bellamy was a reporter (1907-10), city editor (1910-16) and managing editor (1920-33) of that paper. He was president of the American Society of Newspaper Editors in 1933-34 and for many years a director of the Associated Press.

Beda, Julien, French essayist and novelist (b. Paris, Dec. 26, 1867—d. Paris, June 7, 1956).

Bennett, John, U.S. author (b. Chillicothe, O., May 17, 1865—d. Charleston, S.C., Dec. 28, 1956).

Bassley, Robert Russell, U.S. anatomist and educator (b. Hamilton, Ont., Nov. 13, 1867—d. Chicago, Ill., June 11, 1956).

Bentley, Edmund Clerihew, British writer (b. London, July 10, 1875—d. London, March 30, 1956).

Benton, John Keith, U.S. educator (b. Banks, Ala., May 24, 1896—d. Nashville, Tenn., Aug. 21, 1956).

Biele, Mrs. Margaret Thompson, U.S. writer (b. Helena, Mont., 1898?—d. Paris, Fr., June 8, 1956).

Bierut, Boleslaw, Polish Communist leader (b. Lublin, Pol., April 18, 1892—d. Moscow, U.S.S.R., March 12, 1956), came early under the influence of Polish left-wing Socialists and in Dec. 1918, when Poland regained independence, joined the newly founded Communist Party of Poland (K.P.P.). During 1921-27 he visited Moscow twice for training and was three times arrested and imprisoned in Poland. He spent five years in the Comintern offices in Berlin, Vienna and Prague, and in 1932 he once more returned to Poland. In 1937, Bierut made his way to Moscow, but in 1938 the K.P.P. was dissolved by the Comintern. He reached Warsaw in Jan. 1943 with orders to lead the new clandestine Polish Workers' (Communist) party

(P.P.R.). In Jan. 1944 he formed the National Council of the Homeland, of which he was chairman. When on July 22, 1944, the Soviet-sponsored Polish Committee of National Liberation was formed at Lublin, Bierut was its chairman. He took the title of provisional president of the Polish republic in June 1945 and was elected to this post on Feb. 5, 1947. From Sept. 3, 1948, he was also secretary-general of the P.P.R. On Nov. 20, 1952, he ceased to be president of the republic and instead became premier. He gave up the premiership on March 19, 1954, retaining the function of first secretary of the United Polish Workers' party (P.Z.P.R.), a new name for the Communist Party of Poland from Dec. 1948. In Feb. 1956 he led the Polish delegation to the 20th congress of the Communist party of the Soviet Union.

Binder, Carroll, U.S. editor (b. Mechanicsburg, Pa., Feb. 20, 1896—d. Minneapolis, Minn., May 1, 1956), was a foreign correspondent and foreign editor of the *Chicago Daily News* from the early 1920s until 1944, and editorial page editor of the *Minneapolis Tribune* from 1945 until his death. As vice-chairman of the United Nations subcommittee on freedom of information from 1948 to 1952, Binder urged that a convention on freedom of the news be drafted that would protect and encourage international exchange of information.

Binford, Lloyd Tilghman, U.S. broker and motion-picture censor (b. Duck Hill, Miss., Dec. 16, 1866—d. Memphis, Tenn., Aug. 27, 1956).

Bingham, Hiram, U.S. senator and explorer (b. Honolulu, Hawaii, Nov. 19, 1875—d. Washington, D.C., June 6, 1956), was Republican senator from Connecticut 1924-33 and chairman of the federal loyalty review board (appointed to review suspected cases of subversion among federal employees), 1951-53. A graduate of Yale university (1898), and with a Ph.D. from Harvard university, he taught history at several eastern U.S. universities and directed the Yale archaeological expedition of 1911 that discovered Machu Picchu, last capital city of the Incas, in Peru.

Birch, Francis Lyall, British historian (b. Dec. 5, 1889—d. London, Eng., Feb. 14, 1956).

Birdseye, Clarence Frank, U.S. inventor (b. Brooklyn, N.Y., Dec. 9, 1886—d. New York, N.Y., Oct. 7, 1956).

Bishop, William Avery, Canadian air marshal (b. Owen Sound, Ont., Feb. 8, 1894—d. Palm Beach, Fla., Sept. 11, 1956), was Canada's premier ace of World War I, having shot down 72 enemy planes in about 175 air engagements. He was a cadet at the Royal Military college, Kingston, Ont., when World War I broke out. Sent overseas, he transferred from the cavalry to the air force, and on March 25, 1917, he shot down his first German plane. Among his many decorations was the Victoria cross, Britain's highest military decoration, awarded for destroying three planes over German territory amid intense ground fire. On a single day he engaged 23 German planes on the western front, downed three and returned to his base unscathed. During World War II Bishop, with the rank of air marshal, directed all recruiting activities for the Royal Canadian air force. He was the author of several books dealing with military aviation and with his reminiscences of World War I.

Black, Harry C., U.S. financier (b. Baltimore, Md., June 23, 1887—d. Boynton Beach, Fla., Nov. 25, 1956).

Black, Loring Milton, Jr., U.S. lawyer and public official (b. New York, N.Y., May 17, 1886—d. Washington, D.C., May 21, 1956).

Blackman, Aylward Manley, British Egyptologist (b. Dawlish, Eng., Jan. 30, 1883—d. Abergele, Wales, March 9, 1956).

Blake, Henry Seavey, U.S. publisher (b. Minneapolis, Minn., Feb. 14, 1888—d. Topeka, Kan., March 10, 1956).

Blanchard, Arthur Alphonzo, U.S. chemist and educator (b. Boston, Mass., May 4, 1876—d. Brookline, Mass., March 25, 1956).

Boeing, William Edward, U.S. aircraft manufacturer (b. Detroit, Mich., Oct. 1, 1881—d. aboard ship in Puget sound, Wash., Sept. 28, 1956), was a pioneer in aircraft and its construction, having early been associated with Glenn L. Martin who instructed him in flying. Boeing attended Yale university (1899-1902) and served with the U.S. navy in World War I. In 1916 he founded the Pacific Aero Products company, which in 1929 became the Boeing Airplane Co. Boeing retired from the company in 1934. In the same year he received the Daniel Guggenheim medal for "successful pioneering and achievement in aircraft manufacture and air transport."

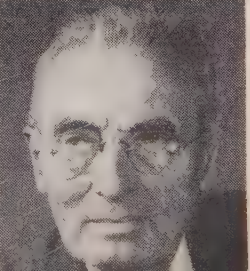
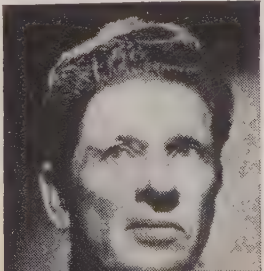
Bogert, John Lawrence, U.S. naval architect and editor (b. Flushing, N.Y., Oct. 27, 1858—d. Southampton, N.Y., Aug. 11, 1956).

Borowski, Felix, U.S. music critic, composer and educator (b. Burton-in-Kendal, Eng., March 10, 1872—d. Chicago, Ill., Sept. 6, 1956), was a music critic for several Chicago newspapers (1906-1956) and annotator of programs for the Chicago Symphony orchestra. He composed several orchestral works and was president of the Chicago Musical college (1916-25) and professor of musicology (1937-42) at Northwestern university, Evanston, Ill.

Bovey, Wilfrid, Canadian legislator (b. Montreal, Que., Dec. 13, 1882—d. Montreal, Oct. 11, 1956).

Bowen, Norman Levi, U.S. geologist (b. Kingston, Ont., June 21, 1887—d. Washington, D.C., Sept. 11, 1956).

66 OBITUARIES: William E. Boeing, U.S. aircraft manufacturer; Louis Mumfield, U.S. author; Bob Burns, U.S. comedian; Guido Cantelli, Italian conductor; Anton J. Carlson, U.S. physiologist



Boyd, William Madison, U.S. educator (b. Morehead City, N.C., April 8, 1916—d. Atlanta, Ga., March 10, 1956).

Bratt, Ivan, Swedish physician (b. Smaland, Swed., 1878—d. Stockholm, Jan. 25, 1956).

Brecht, Bertolt, German poet and playwright (b. Augsburg, Ger., Feb. 10, 1898—d. eastern Berlin, Aug. 14, 1956), was a leading exponent of cynical humour and satire and one of the most controversial figures in the European theatre. He studied natural sciences and philosophy at Munich and Berlin universities, but intellectually he was the product of the great moral ferment that followed World War I. His earlier plays, *Trommeln in der Nacht* and *Baal*, won him the Kleist literary prize in 1922. Six years later *Die Dreigroschen-Oper* (with music by Kurt Weill) was a great success in Germany and abroad. When Hitler came to power Brecht sought asylum successively in Denmark, Sweden and Finland, settling in 1941 in the U.S. In 1947 he was called before the house committee on un-American activities, where he testified that he was not and never had been a member of any Communist party. However in 1948 he returned to east Germany, accepting an offer to conduct in his own way the *Theater am Schiffbauerdamm* in east Berlin. His irony and stern moral pessimism were not easy to reconcile with Marxist ideology and his theatre—the glory of east Berlin in western eyes—was rather an embarrassment to the east German government. Shortly after Brecht's death three of his plays—*Mutter Courage und ihre Kinder*, *Das kaukasische Kreidekreuz* and *Pausen und Trumpheten*—were presented in London by the Berliner ensemble.

Breed, Robert Stanley, U.S. bacteriologist (b. Brooklyn, Pa., Oct. 17, 1877—d. Geneva, N.Y., Feb. 10, 1956).

Brennan, Andrew James, U.S. Roman Catholic prelate (b. Towanda, Pa., Dec. 14, 1877—d. Norfolk, Va., May 23, 1956).

Brody, Samuel, U.S. scientist and educator (b. Garbachi, Lith. [later Pol.], Feb. 8, 1890—d. Columbia, Mo., Aug. 6, 1956).

Bromfield, Louis, U.S. author (b. Mansfield, O., Dec. 27, 1896—d. Columbus, O., March 18, 1956), was almost as well known for his farm conservation theories as for his widely read novels. At his Malabar farm near Lucas, O., he successfully experimented in stepped-up food production through soil enrichment and erosion control. These and other scientific studies were recorded in many books and articles. Earlier, Bromfield had worked on several newspapers and magazines after studying at Cornell and Columbia universities and serving as an ambulance driver during World War I. His first novel, *The Green Bay Tree* (1924), was an immediate success; it was followed by *Possession* (1925); *Early Autumn* (1926), winner of the Pulitzer prize in that year; *A Good Woman* (1927); and a score or more of other best-selling works, including *The Rains Came* and *Mrs. Parkington*. Several of these were made into motion pictures. In politics Bromfield at first supported the New Deal but fell away from it in disagreement with Pres. Franklin D. Roosevelt's farm policy, particularly the program of price supports for agricultural products.

Brown, Gertrude Foster (MRS. RAYMOND BROWN), U.S. suffragist (b. Morrison, Ill., July 29, 1867—d. Westport, Conn., March 1, 1956).

Brown, Roy, U.S. landscape painter (b. Decatur, Ill., April 7, 1879—d. Nashua, N.H., May 16, 1956).

Brown, Sevellon Ledyard, U.S. publisher and editor (b. Washington, D.C., Nov. 23, 1886—d. Tucson, Ariz., Dec. 28, 1956).

Browning, "Peaches" (MRS. FRANCES HEENAN HYNES CIVELLI WILLSON), U.S. child bride of 1920s (b. Columbus, O., June 23, 1910—d. New York, N.Y., Aug. 23, 1956).

Bryan, James Wesley, U.S. public official (b. Lake Charles, La., March 11, 1874—d. Bremerton, Wash., Aug. 26, 1956).

Burns, Bob, U.S. comedian (b. Van Buren, Ark., 1890?—d. Encino, Calif., Feb. 2, 1956), rose to stardom on radio in the 1930s playing his bazooka, a homemade musical instrument contrived from a gas pipe and a funnel (a name later given to the U.S. infantry weapon of World War II). He studied civil engineering at the University of Arkansas at Fayetteville, appeared briefly in motion pictures in 1913 and served with the U.S. marine corps abroad during World War I. The "Arkansas traveler" and "sage of the Ozarks," as he was variously called in the entertainment world, attained success on the radio programs of Bing Crosby and Rudy Vallee with his bazooka and his homespun stories of rural Arkansas. About 1935 he returned to motion pictures, starring in such films as *The Singing Vagabond*, *Rhythm on the Range*, *Mountain Music*, *Wells Fargo*, *The Arkansas Traveler*, *Our Leading Citizen*, *Belle of the Yukon* and *Prarie Schooner*.

Butler, Edward Hubert, U.S. publisher and editor (b. Buffalo, N.Y., June 19, 1883—d. Buffalo, Feb. 19, 1956).

Calhern, Louis (CARL HENRY VOGT), U.S. actor (b. Brooklyn, N.Y., Feb. 19, 1895—d. Nara, Jap., May 12, 1956).

Callahan, James Morton, U.S. historian (b. Bedford, Ind., Nov. 4, 1864—d. Morgantown, W. Va., March 16, 1956).

Campbell, John Bayard Taylor, U.S. editor and author (b. San Francisco, Calif., April 19, 1880—d. Los Angeles, Calif., July 27, 1956).

Cantelli, Guido, Italian musical conductor (b. Novara, It., April 27, 1920—d. Paris, Fr., Nov. 24, 1956), was appointed permanent conductor of the orchestra of La Scala, Milan, little more than a week before his death in a plane crash. He studied at the Milan conservatory and toward the end of World War II returned as a fugitive to Milan where he was seized as a hostage by the Fascist army. At the end of the war he became, at 25, La Scala's youngest conductor. Arturo Toscanini took early note of him, and it was through his influence that Cantelli conducted a New York orchestra in 1948. His first appearance in Great Britain was with Victor de Sabata at the Edinburgh festival of 1950. He had a forceful style and, although his earlier interpretations tended to be superficial, his rendering of Verdi's *Requiem* in London in 1956 was a performance that rated him with the great conductors.

Carleton, Robert Louis, U.S. composer (b. St. Louis, Mo., Nov. 8, 1896—d. Los Angeles, Calif., July 12, 1956).

Carlson, Anton Julius, U.S. physiologist (b. Bohuslän, Swed., Jan. 29, 1875—d. Chicago, Ill., Sept. 2, 1956), was one of the world's greatest physiologists. He was the first (at the age of 29) to explain the origin of the mechanism of the heartbeat in invertebrates. His interests and research included such diverse subjects as the physiology of hunger (he disputed the "conditioned reflex" theory of Ivan Pavlov), blood circulation, saliva formation, the physiology of growing old, alcoholism and the nutritional value of margarine—in all of which he made original and valuable scientific contributions. He was quick to enter public controversy on medical or allied issues, scathingly denouncing antivivisectionists and "monkey-gland rejuvenation" surgeons, among others. Carlson emigrated to the United States from Sweden as a youth of 16 and at first studied for the Lutheran ministry, graduating from Augustana college at Rock Island, Ill., in 1898. His interests veered toward science and medicine, however, and he studied physiology at Stanford university, taking his doctorate there in 1903. He was a research associate with the Carnegie institution (1903-04), then joined the faculty of The University of Chicago, where he advanced from assistant professor to professor and chairman of the department of physiology (1904-40). He then became emeritus professor. He was known as a great teacher. Carlson received the distinguished service gold medal of the American Medical association in 1953.

Carnegie, Hattie (MRS. JOHN ZANET), U.S. fashion designer (b. Vienna, Aus., March 14, 1886—d. New York, N.Y., Feb. 22, 1956), built an \$8,000,000 business out of a millinery-dress shop established on the lower east side of Manhattan in 1909. Her fashion models were designed to appeal to the wealthy and fashionable, and they sold at high prices, in her own shop in New York and in major stores throughout the country.

Carr, Charlotte E., U.S. social worker (b. Dayton, O., May 3, 1890—d. New York, N.Y., July 12, 1956).

Carville, Edward Peter, U.S. public official and lawyer (b. Mound Valley, Nev., May 14, 1885—d. Reno, Nev., June 27, 1956).

Chalmers, Gordon Keith, U.S. educator (b. Waukesha, Wis., Feb. 7, 1904—d. Hyannis, Mass., May 8, 1956).

Chunt, Clarence Augustus, Canadian astrophysicist (b. nr. Toronto, Ont., May 31, 1865—d. Richmond Hill, Ont., Nov. 18, 1956).

Charlot, André Eugene Maurice, French-born theatre manager and actor (b. Paris, July 26, 1882—d. Hollywood, Calif., May 20, 1956).

Charpentier, Gustave, French composer (b. Dieuze, Moselle, June 25, 1860—d. Paris, Feb. 18, 1956).

Chisholm, Louise Brigham (MRS. HENRY ARNOTT CHISHOLM), U.S. author and inventor (b. Boston, Mass.—d. Trenton, N.J., March 30, 1956).

Chrétien, Henri, French scientist (b. Paris, Feb. 1, 1879—d. Washington, D.C., Feb. 7, 1956), developed CinemaScope—the method of screen projection which creates a stereoscopic illusion of depth. He became astronomer at Meudon observatory, Paris, in 1901, chief of the astrophysical department, Nice observatory, in 1906, then a professor of the University of Paris and, from 1920, of the Optical institute (Paris) of which he was a founder. While engaged on research in 1916 he found that anamorphic lenses admit of a wider angle of vision than conventionally ground lenses. Later he saw the possibilities of this discovery in motion pictures. Paramount took a year's option on it in 1929 and Chrétien arranged a demonstration at the 1937 Paris exhibition, but the idea lay fallow until 1952. In 1953 CinemaScope was launched, and Chrétien achieved recognition. He was a knight of the Legion d'Honneur, and in 1954 received from the Academy of Motion Picture Arts and Sciences a technical award for the creation of CinemaScope.

Clausen, Roy Elwood, U.S. geneticist (b. Randall, Ia., Aug. 21, 1891—d. Berkeley, Calif., Aug. 21, 1956).

Coffin, Charles Monroe, U.S. educator (b. Harrod, O., Feb. 20, 1894—d. Pasadena, Calif., July 20, 1956).

Coffin, Oscar Jackson ("Skipper"), U.S. editor and educator (b. Moore county, N.C., Feb. 4, 1887—d. Raleigh, N.C., Oct. 29, 1956).

Collier, William Miller, U.S. diplomat (b. Lodi, N.Y., Nov. 11, 1867—d. West Caldwell, N.J., April 15, 1956).

Comiskey, Grace (MRS. J. LOUIS COMISKEY), U.S. baseball club owner (b. Chicago, Ill., May 15, 1894—d. Chicago, Dec. 10, 1956).

Cooper, Madison Alexander, Jr., U.S. author (b. 1894?—d. Waco, Tex., Sept. 28, 1956).

Corle, Edwin, U.S. novelist (b. Wildwood, N.J., May 7, 1906—d. Santa Barbara, Calif., June 11, 1956).

Cowan, Sir Walter Henry, British admiral (b. Alveston, Eng., June 11, 1871—d. Leamington, Eng., Feb. 14, 1956).

Crampton, Henry Edward, U.S. zoologist (b. New York, N.Y., Jan. 5, 1875—d. New York, N.Y., Feb. 26, 1956).

Crawford, Brenetta Herrman (MRS. E. STETSON CRAWFORD), U.S. painter (b. Toledo, O., Oct. 27, 1876—d. Pasadena, Calif., May 30, 1956).

Cummings, Homer Stillé, U.S. lawyer (b. Chicago, Ill., April 30, 1870—d. Washington, D.C., Sept. 10, 1952), was U.S. attorney general from March 1933 to Jan. 1939, during the first and second administrations of Pres. Franklin D. Roosevelt. In this office his principal task was to try to establish the constitutionality of early New Deal legislation, including the National Industrial Recovery act and the first Agricultural Adjustment act (both ruled unconstitutional by the supreme court), and the securities and exchange, Tennessee Valley authority and social security laws (upheld by the court). It was Cummings who apparently proposed to President Roosevelt the ill-fated plan for "packing" the supreme court with one new justice for each member of the court who had reached the age of 70 and had not retired. During his tenure as head of the department of justice the functions of the Federal Bureau of Investigation were broadened, and the antimonopoly activities of the department were intensified. A graduate of Yale law school (1893), Cummings practised law in Stamford, Conn., until 1933, and was mayor of that city, 1900-02 and 1904-06. Long a Democratic leader, he was offered the appointment as governor general of the Philippines by Roosevelt in Feb. 1933 but accepted the nomination as attorney general when Thomas J. Walsh, Roosevelt's original appointee to the cabinet, died two days before the inauguration. After his resignation from the cabinet, Cummings resumed private law practice in Washington and Stamford. He wrote several books including *We Can Prevent Crime* (1937).

urtis, Harvey Lincoln, U.S. physicist (b. Mason, Mich., Dec. 14, 1875—d. Chevy Chase, Md., April 17, 1956).

urtis, Ernst Robert, German literary historian (b. Thann, Alsace, later Haut-Rhin, Fr., April 14, 1886—d. Rome, It., April 19, 1956), throughout his life studied a wide range of literatures of all ages, his interest being particularly engaged by those deriving from the Latin culture. He was educated at the Protestant gymnasium, Strasbourg, and studied in Berlin and Heidelberg. He taught at Bonn university (1913-19). Marburg (1920-24) and Heidelberg (1924-29); in 1929 he was appointed professor of romance literature and languages at Bonn. For a selection of his works up to 1948 see *Encyclopaedia Britannica*. In 1952 he published *Französischer Geist im 20. Jahrhundert* and in 1953 his comprehensive study *Europäische Literatur und lateinisches Mittelalter* (1948) was translated into English.

ahl, Harold E. ("Whitey"), U.S. adventurer (b. Champaign, Ill., 1909?—d. near Fort Chimo, Que., Feb. 14, 1956), was the central figure in a bizarre episode of the Spanish civil war of 1936-39. A volunteer Loyalist fighter pilot, he was shot down and captured by Gen. Francisco Franco's forces, and was sentenced to death. Franco personally reprieved Dahl after receiving a plea from Mrs. Dahl which was accompanied by a photograph of herself. Freed in 1940, Dahl was a squadron leader for the Canadian air force in World War II, but was accused of irregular traffic in government property. In 1954 he was sentenced in Switzerland to two years' imprisonment for the alleged theft of gold bullion from a Swiss plane he was piloting; he was released on bond the following year after a new trial. Dahl was killed when a plane he was piloting crashed in the wilderness of northern Quebec.

amon, Ralph Shepard, U.S. air line executive (b. Franklin, N.H., July 6, 1897—d. Mineola, L.I., N.Y., Jan. 4, 1956), graduated with honours from Harvard university in 1918 and entered the commercial aviation business in 1922 with the Curtiss Aeroplane and Motor company, of which he became president in 1935. In this and subsequent positions, Damon helped produce some of the more famous U.S. commercial and military aircraft, including the Curtiss Condor and the Republic Thunderbolt. He left Curtiss to join American Airlines, of which he was president from 1945 to 1949. During World War II he was for a time president of Republic Aviation corporation (1941-43). From Jan. 1949 until his death Damon was president of Trans World Airlines.

avis, Nathan Smith, III, U.S. physician (b. Chicago, Ill., June 25, 1889—d. Chicago, April 20, 1956).

avis, Owen, U.S. playwright (b. Portland, Me., Jan. 29, 1874—d. New York, N.Y., Oct. 14, 1956).

watson, Mitchell, U.S. attorney and author (b. Chicago, Ill., May 13, 1890—d. Winnetka, Ill., Sept. 3, 1956), was admitted to the Illinois state bar in 1913 after taking his law degree from The University of Chicago, and practised law in Chicago thereafter. An articulate writer on legal subjects, he was a columnist for the *Chicago Daily News* and other newspapers and wrote articles on law topics for *Encyclopaedia Britannica*. He also was an author of children's stories, including *The Magic Firecrackers* (1949).

Golyer, Everette Lee, U.S. geologist (b. Greensburg, Kan., Oct. 9, 1886—d. Dallas, Tex., Dec. 14, 1956).

La Mare, Walter John, British poet, novelist and essayist (b. Charlton, Kent, April 25, 1873—d. Twickenham, June 22, 1956), was a writer whose sensitive imagination and faculty of seeing with the "innocent eye" of childhood permeated a prolific and varied output. His early works included the short stories "Kismet" (1895) and "The Mote" (1896) and the book of poems *Songs of Childhood* (1902). His poetry was chiefly lyrical and from "The Listeners" (1912) to "The Traveller" (1946) and "O Lovely England" (1954) exhibited no diminution in imaginative power. Notable collections were *The Listeners and Other Poems* (1912), *Peacock Pie* (1913), *Motley and Other Poems* (1918) and *Collected Rhymes and Verses* (1944). That he was an anthologist of great talent was proved by *Early One Morning* (1935) and *Love* (1943), as well as the lengthier *Behold, This Dreamer* (1939). His personal and literary preoccupation with the state of childhood resulted in a sympathy and understanding that was exemplified in his many children's stories, including *The Lord Fish* (1933) and *The Scarecrow* (1945), and in his poems for children. Some of his prose tales, such as the story *Seaton's Mount* (1923), the novels *Henry Brocken* (1904) and *The Return* (1910), were influenced by his interest in the supernatural. His other novel, *Memoirs of a Midget* (1921), showed his psychological insight. He also wrote essays, *Private View* (1953); a play on a fairy theme, *Crossings* (1921); and the "rambling discourse," *Desert Islands* (1930), a *tour-de-force* on the Robinson Crusoe theme which illustrated his uniquely personal outlook, an escapism without urgency. (See also *Encyclopaedia Britannica*.)

amarest, William Henry Steele, U.S. educator (b. Hudson, N.Y., May 12, 1863—d. New Brunswick, N.J., June 23, 1956).

Palma, Ralph, U.S. automobile racer (b. Italy 1883?—d. South Pasadena, Calif., March 31, 1956), was believed to have won more races than any other driver up to the time of his death—reportedly 2,557 out of 2,889. However, he won the Indianapolis (Ind.) 500-mi. speedway race only once, in 1915, driving a Mercedes at an average speed of 89.84 mi. per hour. De Palma, who emigrated to the United States at the age of 10 and became a U.S. citizen in 1920, was twice named national champion of the American Automobile association (1912, 1914) and held a number of other racing championships. He retired from the tracks in 1934. At various times during his career he was associated as engineer, designer, consultant or in other capacities with leading U.S. automobile, aircraft and petroleum companies.

uel, Harry James, Jr., U.S. biochemist and educator (b. St. Paul, Minn., Oct. 15, 1897—d. Pasadena, Calif., April 17, 1956).

ckson, Edward Augustus, U.S. editor and publisher (b. Sheboygan, Wis., Aug. 29, 1879—d. Los Angeles, Calif., Feb. 22, 1956).

cavolo, Antonio, Italian painter (b. Bologna, It., 1878—d. nr. La Spezia, Italy, 10, 1956).

can, Mort, U.S. song writer (b. New York, N.Y., March 20, 1892—d. New

York, March 23, 1956).

Dohna-Schlodien, Nikolaus zu, COUNT OF (BURGGRAF UND GRAF NIKOLAUS RICHARD ZU DOHNA-SCHLODIEN), German naval officer (b. Mallnitz, Ger., 1879—d. Rosenheim, Aug. 21, 1956).

Doran, George Henry, Canadian publisher (b. Toronto, Ont., 1869—d. Toronto, Jan. 7, 1956).

Dorsey, Thomas Francis, Jr. (Tommy), U.S. band leader (b. Mahanoy City, Pa., Nov. 19, 1905—d. Greenwich, Conn., Nov. 26, 1956), rose from boy trombonist in the orchestra of his father, a Pennsylvania coal miner and music teacher, to become one of the best-known and highest paid U.S. band leaders of the 20th century. An exponent of what critics called "sweet jazz," he was nicknamed the "sentimental gentleman of swing." His recordings, including his theme song "I'm Getting Sentimental Over You," were estimated to have sold more than 100,000,000 impressions. After playing in various name bands such as those of Paul Whiteman and Vincent Lopez, Dorsey organized his own band with his brother Jimmy, a saxophonist, in 1934. Despite periodic fallings-out, the two brothers continued to perform as a musical team. Tommy Dorsey and his trombone were featured in a number of motion pictures and TV-radio programs and in occasional classical concerts.

Draper, Ruth, U.S. monologist (b. New York, N.Y., Dec. 2, 1884—d. New York, Dec. 30, 1956), entertained theatregoers throughout the world for four decades with her humorous and wistful solo portrayals, in several languages, of 40 or more different characters. The granddaughter of Charles A. Dana (1819-97), publisher of the old *New York Sun*, she occasionally appeared on the stage with her nephew Paul Draper, the dancer. She toured all continents and was received with equal warmth in Java, Ceylon, the United States, South Africa or South America. Miss Draper gave her "farewell" performance in New York city in 1954 but later returned to the stage and was making another series of appearances on Broadway when she died suddenly in her Manhattan home.

Dreyer, Sir Frederic Charles, British naval officer (b. Parsonstown, Eng., Jan. 8, 1878—d. Winchester, Dec. 11, 1956).

Drinker, Cecil Kent, U.S. educator and physician (b. Philadelphia, Pa., March 17, 1887—d. Falmouth, Mass., April 14, 1956).

Drummond, Alexander M., U.S. educator (b. Auburn, N.Y., July 15, 1884—d. Ithaca, N.Y., Nov. 29, 1956).

Duckworth, Wynfrid Laurence Henry, British anthropologist and anatomist (b. Liverpool, Eng., June 5, 1870—d. Cambridge, Feb. 14, 1956).

Duff, G(eorge) Lyman, Canadian pathologist and educator (b. Hamilton, Ont., Jan. 26, 1904—d. Montreal, Que., Nov. 1, 1956).

Duggar, Benjamin Minge, U.S. botanist and educator (b. Gallion, Ala., Sept. 1, 1872—d. New Haven, Conn., Sept. 10, 1956), in 1948 isolated the antibiotic aureomycin, one of the most widely used of the "miracle drugs." Duggar led a team of scientists who discovered it at the Lederle laboratories of the American Cyanamid company in Pearl River, N.Y., where he was employed as a research and production consultant after his compulsory retirement from teaching at the University of Wisconsin in 1943. He was a graduate of Harvard (B.A., 1894; M.A., 1895) and took his doctorate at Cornell university, Ithaca, N.Y., in 1898, later continuing his studies in Germany, Italy and France. From 1912 to 1927 he was professor of plant physiology at Washington university, St. Louis, Mo., and from 1927 to 1943 professor of physiology and botany at Wisconsin.

Dunn, Sir James Hamet, Canadian financier (b. Bathurst, N.B., Oct. 29, 1875—d. St. Andrews, N.B., Jan. 1, 1956).

Edge, Walter Evans, U.S. senator, state governor and diplomat (b. Philadelphia, Pa., Nov. 20, 1873—d. New York, N.Y., Oct. 29, 1956), was a conservative Republican leader for more than 50 years. He attained business success as an advertising executive, banker and publisher before entering public life in 1910 as a member of the New Jersey state assembly. After serving in the state senate for two terms (1911-16), Edge was elected governor of New Jersey for the term 1917-20, but resigned to become U.S. senator from New Jersey (1919-29). He resigned from the senate to become Pres. Herbert Hoover's ambassador to France (1929-33). Edge was again governor of New Jersey from 1944 to 1947.

Edmonds, Sir James Edward, British army officer and historian (b. Dec. 25, 1861—d. announced London, Eng., Aug. 7, 1956).

Edwards, Richard Stanislaus, U.S. admiral (b. Philadelphia, Pa., Feb. 18, 1885—d. Oakland, Calif., June 2, 1956).

Eisenstein, Judah David, U.S. editor and publisher (b. Miedzyrzecz, Pol., Nov. 12, 1854—d. New York, N.Y., May 17, 1956).

Eldred, Byron E., U.S. physicist (b. Jackson, Mich., Feb. 12, 1873—d. Torrington, Conn., May 26, 1956).

Elizabeth (ELIZABETH CHARLOTTE JOSEPHINE VICTORIA ALEXANDRA), former queen of Greece (b. Sinaia, Rum., Sept. 29, 1894—d. Cannes, Fr., Nov. 14, 1956), was the daughter of King Ferdinand and Queen Marie of Rumania and the sister of King Carol II; she was a great-granddaughter of Queen Victoria. She was strikingly beautiful when she married the crown prince (later King George II) of Greece in Bucharest on Feb. 27, 1921, but a severe illness rendered her incapable of having children. The royal pair became king and queen in Sept. 1922, but in Dec. 1923 they were exiled to Rumania as a result of a republican movement. In 1935 Elizabeth divorced her husband (who shortly afterward returned to Greece as king) on the grounds of unfaithfulness and desertion. She left Rumania in Jan. 1948, finally settling in Cannes in 1952.

Ely, Joseph Buell, U.S. public official and attorney (b. Westfield, Mass., Feb. 22, 1881—d. Westfield, June 13, 1956).

Emerson, John, U.S. playwright and actor (b. Sandusky, O., May 29, 1874—d. Pasadena, Calif., March 8, 1956).

Evershed, John, British astronomer (b. Gomshall, Surrey, Eng., Feb. 26, 1864—d. London, Nov. 17, 1956).

Ewing, Fayette Clay, U.S. surgeon and author (b. La Fourche parish, La., May 28, 1862—d. Pineville, La., April 15, 1956).

Fadeyev, Aleksandr Aleksandrovich, Russian writer (b. Kimry, near Kalinin, Dec. 24, 1901—d. Moscow, May 13, 1956), passed his youth in the Urals and the far east, receiving his schooling in Vladivostok. He joined the Communist party in 1918 and fought as a partisan in Siberia against the "White" Russians. From 1926 he began to take a leading part in literary life, and in 1929 published the first of the four volumes of a novel devoted to the civil war in the far east, *Posledny iz Udege* ("The Last of the Udege"); it was completed in 1940. At that time he was a member of the board of the Soviet Writers' union, of which in 1946 he became secretary-general. In 1945 he published *Molodaya Gvardia* ("The Young Guard"), a novel about the exploits of young Ukrainian partisans behind the German front. He was awarded a Stalin prize for this work in 1948, but later he re-wrote it after the Politburo had assailed it as "falsely showing panic in the early days of the Patriotic War." In 1948, when chief Soviet delegate at the International Cultural Congress for Peace at Wrocław, Pol., he declared, "If hyenas could type and jackals could use fountain pens, they would write like T. S. Eliot, Eugene O'Neill and Jean-Paul Sartre." At various times Fadeyev was a member of the central committee.

Fairey, Sir Charles Richard, British aircraft designer (b. Hendon, Eng., May 5, 1887—d. London, Sept. 30, 1956), was educated at Merchant Taylors' school and at Finsbury technical college, where he studied engineering and chemistry. In 1915, after two years as chief engineer to Short Brothers, he founded the Fairey aviation company and became its executive chairman. During 1922-24 he was chairman of the British society of aircraft constructors and he was director-general of the British air commission in Washington, 1942-45. Sir Richard was twice president of the Royal Aeronautical society (1930-31, 1932-33) and in 1936 the society awarded him the Wakefield gold medal for the invention and development of the wing flap. He stimulated many advances in aircraft design and among the famous aircraft built under his leadership were the Swordfish, the Gannet (which in 1954 was the first gas-turbine engine antisubmarine aircraft) and the Fairey Delta II, the first aircraft to fly at more than 1,000 m.p.h. Fairey was also a distinguished yachtsman, owning and racing such famous vessels as the 12-m. "Flica" and the J class "Shamrock V." He was knighted in 1942.

Feininger, Lyonel (Charles Adrian), pioneer U.S. modernist painter (b. New York, N.Y., July 17, 1871—d. New York, N.Y., Jan. 13, 1956), was a member of the famous "Blue Rider" group of expressionist painters who first exerted a potent influence on American painting shortly after 1910. Originally trained as a musician, he was in middle age still composing works for public performance, but as early as 1907 he had become a professional and full-time artist, having studied art in Germany and Paris, Fr. From 1919 until the early 1930s he taught painting at the Bauhaus laboratory school of art in Weimar and Dessau, Ger. He returned to the U.S. after the Nazi regime had condemned his work as degenerate. His work was widely exhibited (1930-50) in the U.S. and elsewhere.

Field, Marshall, III, U.S. publisher and philanthropist (b. Chicago, Ill., Sept. 28, 1893—d. New York, N.Y., Nov. 8, 1956), was the grandson of the founder of Marshall Field & Co., pioneer Chicago department store, from whom he inherited a fortune estimated at between \$150,000,000 and \$200,000,000. He was educated at Eton college and Cambridge university in England. After World War I, in which he served as a U.S. artillery officer in France, Field engaged in real estate and investment bank operations. In 1940 he established the liberal New York daily *PM*, which later discontinued publication; and the following year the pro-New Deal *Chicago Sun*, later merged with the tabloid *Times* to form the successful *Sun-Times*. Field founded Field Enterprises, Inc., a holding company for large investments in the *Sun-Times*, *World Book Encyclopedia*, the publishing houses of Simon & Schuster and Pocket Books, Inc., and other concerns. He was a benefactor and director of numerous civic and philanthropic organizations, including the Field museum in Chicago, founded by his grandfather and later renamed the Chicago Natural History museum.

Findley, Earl Nelson, U.S. editor and publisher (b. Xenia, O.—d. Washington, D.C., July 11, 1956).

Fink, Denman, U.S. artist (b. Springdale, Pa., Aug. 29, 1880—d. Miami, Fla., June 7, 1956).

Fitzgerald, Richard Joseph, Irish Roman Catholic prelate (b. Middleton, Ire., Aug. 12, 1881—d. Gibraltar, Feb. 15, 1956).

Fleming, John Adam, U.S. geophysicist (b. Cincinnati, O., Jan. 28, 1877—d. San Mateo, Calif., July 29, 1956).

Flynn, Vincent Joseph, U.S. Roman Catholic priest and educator (b. Avoca, Minn., Sept. 11, 1901—d. St. Paul, Minn., July 6, 1956).

Ford, Mrs. Frances M., U.S. author (b. Elmira, N.Y.—d. Philadelphia, Pa., June 15, 1956).

Foster, Michael, U.S. novelist (b. Hardy, Ark., Aug. 29, 1904—d. Reno, Nev., March 25, 1956).

Franklin, Herbert Henry, U.S. automobile manufacturer (b. Lisle, N.Y., 1878—d. Syracuse, N.Y., April 16, 1956).

Friend, Albert Mathias, Jr., U.S. educator and archaeologist (b. Ogontz, Pa., Feb. 27, 1894—d. Princeton, N.J., March 23, 1956).

Gardner, Lester Durand, U.S. publisher (b. New York, N.Y., Aug. 7, 1876—d. New York, Nov. 23, 1956).

Gaston, Herbert Earle, U.S. banker and government official (b. Halsey, Ore., Aug. 20, 1881—d. Los Angeles, Calif., Dec. 7, 1956).

Gauvreau, Emile Henry, U.S. journalist (b. Centerville, Conn., Feb. 4, 1891—

d. Suffolk, Va., Oct. 15, 1956), originated new techniques of journalism that spurred the circulation of papers he edited, including the old *New York Evening Graphic* (1924-29) and the *New York Daily Mirror* and *Sunday Mirror* (1929-35). One of these techniques was the "composograph," consisting of retouched photographs of persons in the news. Gauvreau also led drives to establish Mark Twain's home in Hartford, Conn., as a literary monument; and to restore full military honours in 1945 to Gen. William (Billy) Mitchell (1879-1936), pioneer advocate of air v. sea power who was court-martialled in 1925 for making statements deemed contrary to military discipline. Gauvreau's books, some of which were made into motion pictures, included *Hot News; What So Proudly We Hailed; The Wild Blue Yonder*; and *My Last Million Readers*, his autobiography.

Ghulam Mohammed, Pakistani statesman (b. Lahore, Pak., Aug. 29, 1895—d. Karachi, Aug. 29, 1956), was governor-general of Pakistan from Oct. 1951 until failing health forced his resignation in Sept. 1955. Educated at Aligarh Moslem university he passed into the Indian audit service in 1920. During 1932-34 he was commissioner of development in Bhopal state and held several senior appointments with the government of India, 1934-42. He became finance member in the nizamat of Hyderabad's executive council in 1942 and, on resigning from the public service in 1945, was appointed a director of Tata's iron and steel works and became an active member of the council of the All-India Moslem league. In 1947, in the newly created state of Pakistan, he was appointed finance minister and minister of commerce and economic affairs, succeeding to the governor-generalship in Oct. 1951. Ghulam Mohammed shouldered with courage and determination the heavy responsibilities falling on the governor general before the framing of the new constitution. He twice dismissed ministries of the central government and in 1954 he dissolved the constituent assembly for failure to fulfil its duties.

Gibbon, John Heysham, Sr., U.S. surgeon and educator (b. Charlotte, N.C., March 16, 1871—d. Philadelphia, Pa., March 13, 1956).

Gibbs, Arthur H., U.S. composer (b. Savannah, Ga., Dec. 25, 1895—d. New York, N.Y., March 17, 1956).

Gibson, Irene Langhorne (Mrs. CHARLES DANA GIBSON), U.S. model (b. Danville, Va.—d. Greenwood, Va., April 20, 1956).

Gieseeking, Walter Wilhelm, German pianist (b. Lyons, Fr., Nov. 5, 1895—d. London, Eng., Oct. 26, 1956), had no regular musical training until 1911 when he began studying under Karl Leimer at the Hanover Musical conservatory. He made his first appearance in 1913 but his career was interrupted by World War I during which he served as a regimental bandsman. He first appeared in London in 1923 and gave many concerts throughout Europe and North America which included works by Beethoven, Debussy, Liszt and Scarlatti. After World War II he was ostracized for his associations with the nazis but admiration for his outstanding artistic ability soon caused resentment to die down. His compositions include a set of variations and a sonatina for flute and piano.

Gilliatt, Sir William, British gynecologist and surgeon (b. Boston, Eng., 1884—d. Chertsey, Surrey, Sept. 27, 1956).

Glانville, Stephen Ranulph Kingdon, British Egyptologist (b. Westminster, Eng., April 26, 1900—d. Cambridge, April 26, 1956).

Glaoui, Haj Thami ben Mohammed el-Mezuari el-, Moroccan chieftain (b. Teluet, 1874?—d. Marrakesh, Jan. 23, 1956), was the son of the head of the Berber Glaoui tribe of the Great Atlas. His youth was spent largely in local wars. Morocco was then in an anarchic condition and the sultan's word prevailed little among the mountain tribes. In 1907 Madani, Thami's elder brother and lord of Tafilalet, overthrew the sultan Abdul Aziz who in 1908 was succeeded by Mulai Hafid. Madani became grand vizier (premier) while Thami succeeded his brother as pasha of Marrakesh. When in 1912 the French succeeded in establishing their protectorate over the sherrifian empire, Thami welcomed them and fought with them to quell the Berber tribes. The chief "friend of France," he maintained his feudal authority and the right to levy taxes and administer justice. He owned four palaces, half the city of Marrakesh, and shares in many businesses. The beginning of the end of el-Glaoui's career took form in 1953 when he was used by the French in deposing the sultan Mohammed V ben Yusuf as a means of suppressing nationalism. Twice in 1954 (Feb. 20 and March 5) he narrowly escaped assassination. Later when the French decided to call back Mohammed V, el-Glaoui's opposition was ignored; he finally called for his own return but on Nov. 8, 1955, in Paris, he acknowledged the reinstated sultan. "Be cursed those who have misled me!" he muttered.

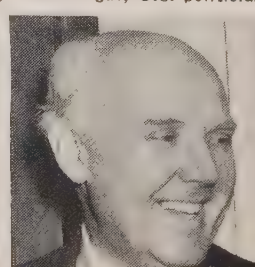
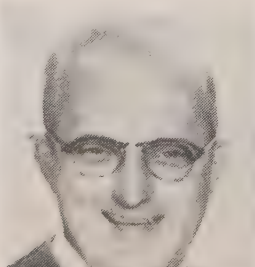
Godbout, Joseph Adélard, Canadian legislator (b. St. Eloi, Que., Sept. 24, 1892—d. Montreal, Sept. 18, 1956).

Goldman, Edwin Franko, U.S. composer and conductor (b. Louisville, Ky., Jan. 1, 1878—d. New York, N.Y., Feb. 21, 1956).

Graves, Frank Pierrepont, U.S. educator and lawyer (b. Brooklyn, N.Y., July 23, 1869—d. Albany, N.Y., Sept. 13, 1956).

Griffin, Bernard William, British Roman Catholic prelate (b. Birmingham, Eng., Feb. 21, 1899—d. New Polzeath, Eng., Aug. 20, 1956), was educated at Cotton college, Staffordshire, and served in the royal naval air service near the end of World War I before entering the seminary of the Birmingham

1956 OBITUARIES: Hattie Carnegie, U.S. fashion designer; Tommy Dorsey, U.S. band leader; Marshall Field III, U.S. businessman; Walter W. Gieseeking, German pianist; Frank Hague, U.S. politician



archdiocese at Oscott. From 1921 to 1926 he studied at English seminaries in Rome, receiving doctorates in divinity and canon law, having been ordained in 1924. He was secretary to the archbishops of Birmingham (1927-37) and also chancellor of the archdiocese (1929-38). In 1938 he was consecrated bishop auxiliary of Birmingham, and in Dec. 1943, nine months after Cardinal Hinsley's death, he was appointed archbishop of Westminster. He was made cardinal (the youngest in the Sacred college at the time) by Pope Pius XII in 1946 and pursued his subsequent career with such unmitigated energy and determination that he suffered several breakdowns in health, notably in Jan. and Sept. 1949. He was on holiday in Cornwall, after an arduous sequence of engagements, when he died. Though not "primate" of all Roman Catholics in Great Britain, his designation being that of permanent chairman of the bishops' meeting in England and Wales only, and having no jurisdiction outside his own archdiocese, he nevertheless showed qualities of leadership and example which influenced all British Catholics. He made many visits abroad. In addition to pastoral letters, he published a collection of sermons and addresses, *Seek ye First* (1949).

Giulmi, Osvaldo Louis, U.S. painter (b. Cairo, Egy., April 9, 1906—d. Amagansett, N.Y., Sept. 3, 1956).
zik, Jacob ("Greasy Thumb") (alias JACK ARNOLD), U.S. gangland figure (b. Chicago, Ill., 1887?—d. Chicago, Feb. 21, 1956).

Hague, Frank, U.S. politician (b. Jersey City, N.J., Jan. 17, 1876—d. New York, N.Y., Jan. 1, 1956), was one of the last of the old-time city bosses who wielded enormous political power in the latter 19th century and the first half of the 20th century. For more than 25 years, until 1949, he held absolute control of New Jersey state politics and had proportionate influence in the national Democratic party. He served as mayor of Jersey City for eight consecutive four-year terms, ending in 1947. With little formal education, Hague worked as a railroad machinist in his youth and in his early twenties was elected constable of his ward district in Jersey City. He held various municipal jobs and in 1913 was elected city commissioner. By the early 1920s he was the unquestioned boss of the state, and in 1922 was elected Democratic national committeeman. He supported Alfred E. Smith in the Democratic convention of 1932 but switched to Franklin D. Roosevelt after the latter's nomination and enthusiastically supported him in the four subsequent presidential campaigns. Hague drew national attention in 1937 when he arrested or ejected a group of C.I.O. labour organizers from Jersey City, a procedure that was enjoined by court ruling the next year. In the early 1940s he successfully fought Gov. Charles Edison's attempt to weaken his hold on the state by adoption of a new constitution; this proposal was defeated in the state elections of Nov. 1944. Two years later, however, Hague's machine was badly defeated in a Republican state landslide, and Hague retired as mayor in 1947. In 1949 he was toppled as state boss when his hand-picked candidates for mayor of Jersey City and governor of New Jersey were successfully defeated. In April 1952 he also was turned out of his post as Democratic national committeeman.

Jones, William Cassius ("Cyclone"), U.S. meteorologist (b. Reinersville, O., Feb. 1, 1887—d. St. Louis, Mo., April 7, 1956).

Halley, Rudolph, U.S. attorney, crime investigator and city official (b. Harrison, N.Y., June 19, 1913—d. New York, N.Y., Nov. 19, 1956), became a familiar figure to millions of Americans who watched the televised proceedings of Sen. Estes Kefauver's senate crime investigating committee in 1950-51. As chief counsel of that committee Halley helped send a number of underworld characters to prison and secure more effective local and federal control over organized crime. He took his law degree from Columbia University at the age of 21, was law secretary to a U.S. district judge, 1934-7, then was an assistant U.S. attorney for the southern district of New York state for five years. From 1942 to 1945 he was assistant, then chief counsel for Harry S. Truman's senate war investigating committee. During the next five years, prior to his appointment to the Kefauver committee, he was in private law practice. After his resignation from the Kefauver committee in May 1951 he was elected president of the New York City Council on the liberal ticket for a two-year term. In 1953 he ran for mayor of New York city, again as a liberal-independent, but he was defeated by the Democratic candidate, Robert F. Wagner, Jr.

Hjgren, Mauritz Alfred, U.S. editor and author (b. Chicago, Ill., June 18, 1899—d. Baltimore, Md., Nov. 10, 1956).

Johnson, Thomas Truxton, U.S. football player, attorney and author (b. Philadelphia, Pa., Oct. 12, 1878—d. Radnor, Pa., Feb. 2, 1956).

Jones, M(artha) Anstice, U.S. educator (b. Madison, Wis., Aug. 2, 1857—d. Elmira, N.Y., Jan. 14, 1956).

Koser, Ernst Alfred, U.S. chemist and educator (b. Vienna, Aus., July 20, 1896—d. Cambridge, Mass., Feb. 10, 1956).

Leard, William Thomas, British clergyman (b. Neuadd, Sennybridge, Eng., Oct. 23, 1880—d. Gwbert-on-sea, Cardigan, Wales, Aug. 17, 1956).

Lowwood, Harry Le Roy, U.S. editor and author (b. Clermont county, O., Nov. 1, 1886—d. Cedar Rapids, Ia., Feb. 25, 1956).

Trick, Cheesman Abiah, U.S. educator (b. Redwood, N.Y., July 21, 1866—d. Philadelphia, Pa., Feb. 27, 1956).

Hersholt, Jean, U.S. motion-picture actor (b. Copenhagen, Den., July 12, 1886—d. Hollywood, Calif., June 2, 1956). played in his first motion picture

in his native Denmark in 1905 and in his last in the U.S. in 1955. His half century of film roles included successes in such notable silent and sound pictures as *Stella Dallas*, *Alias the Deacon*, *The Country Doctor* (in which he portrayed Allan Dafeo, the doctor who delivered the Dionne quintuplets), *Reunion*, *Heidi*, *Abie's Irish Rose*, *Greed* and *Private Lives*. On radio Hersholt acquired new distinction as "Dr. Christian" in a series introduced in 1937 and continued for more than 15 years. Hersholt emigrated to the United States in 1913 and became a citizen in 1920. He was knighted by King Christian X of Denmark in 1946. He was a student and admirer of Hans Christian Andersen, and translated many of the storyteller's tales into English and eventually possessed the world's greatest collection of Andersen letters, manuscripts and first editions. He played in an estimated 400 motion pictures and was president of the Academy of Motion Pictures Arts and Sciences from 1945 to 1949.

Herzel, Paul, U.S. sculptor (b. Silesia, Ger., 1880—d. New York, N.Y., May 11, 1956).

Heusser, Edward Burlton ("Big Ed"), U.S. baseball player (b. Murray, Utah, May 7, 1909—d. Aurora, Colo., March 1, 1956).

Heuven Goedhart, Gerrit Jan Van, Dutch journalist and UN official (b. Bussum, Neth., March 19, 1901—d. Geneva, Switz., July 8, 1956).

Hinshaw, (John) Carl (Williams), U.S. legislator (b. Chicago, Ill., July 28, 1894—d. Bethesda, Md., Aug. 5, 1956).

Hitler, Adolf, German nazi leader (b. Braunau-am-Inn, Aus., April 20, 1889—d. Berlin, Ger., April 30, 1945). On Oct. 25, 1956, his death by suicide was declared official by a German court.

Hodge, Frederick Webb, U.S. ethnologist (b. Plymouth, Eng., Oct. 28, 1864—d. Santa Fe, N.M., Sept. 28, 1956).

Hodgson, Sir Robert Macleod, British diplomat (b. West Bromwich, Eng., Feb. 25, 1874—d. London, Oct. 18, 1956).

Hollingworth, Harry Levi, U.S. psychologist and educator (b. De Witt, Neb., May 26, 1880—d. Montrose, N.Y., Sept. 17, 1956).

Holmes, Arthur Dunham, U.S. chemist and educator (b. Walpole, N.H., July 19, 1884—d. Amherst, Mass., July 18, 1956).

Hopper, James Marie, U.S. author (b. Paris, Fr., July 23, 1876—d. Carmel, Calif., Aug. 28, 1956).

Horowitz, Louis Jay, U.S. builder (b. Chencstochowa, Pol., Jan. 1, 1875—d. Palm Beach, Fla., Dec. 2, 1956).

Ho Tung, Sir Robert, Hong Kong financier (b. Hong Kong?, Dec. 22, 1862—d. Hong Kong, April 26, 1956), was in appearance and manner the epitome of an old-time Chinese gentleman. From lowly beginnings and after education at what later became Queen's college, Hong Kong, he rose steadily in business, gaining the highly advantageous position of Chinese agent in Jardine, Matheson and Co. By 1900 he was already said to be a millionaire, and thereafter he extended his financial activities to participation in the administration of many important businesses both in Hong Kong and outside its boundaries. Much of his wealth supported philanthropic causes, particularly education.

Howard, Cecil de Blaquiére, U.S. sculptor (b. Niagara Falls, Ont., April 2, 1888—d. New York, N.Y., Sept. 5, 1956).

Howard, Kathleen, U.S. opera singer and actress (b. Niagara Falls, Ont.—d. Hollywood, Calif., Aug. 15, 1956).

Hughes, Rupert, U.S. author (b. Lancaster, Mo., Jan. 31, 1872—d. Los Angeles, Calif., Sept. 9, 1956), had a wide range of literary output, including a number of novels, plays, reference works in music, poetry and biography—notably his three-volume *George Washington* (1926-30) and a biography of Thomas E. Dewey (1940). A graduate of Western Reserve university, Cleveland, O. (1892), he took his master's degrees there (1894) and at Yale (1899). Hughes was an editor for various magazines from 1901 to 1905, and for *Encyclopaedia Britannica*. He saw service in three U.S. wars—on the Mexican border in 1916, and in World Wars I and II. From the latter 1940s he devoted most of his time to motion-picture writing in Hollywood, Calif., although he continued to publish books.

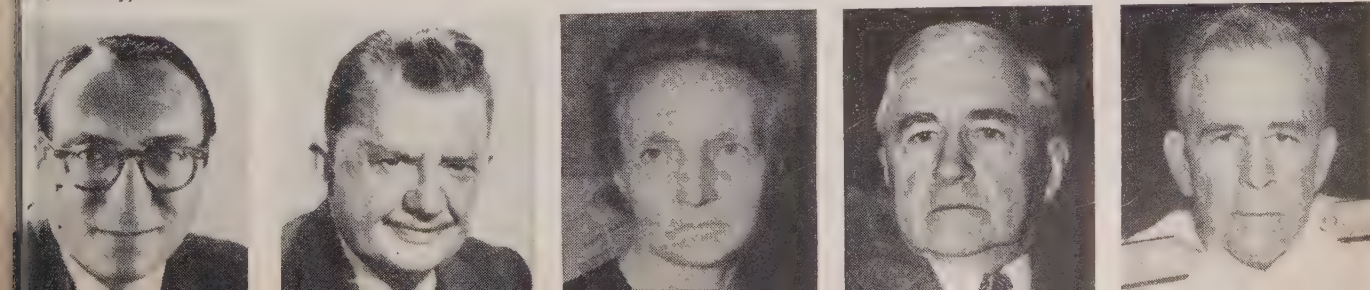
Hull, Gordon Ferrie, U.S. physicist (b. Garnet, Ont., Oct. 7, 1870—d. Hanover, N.H., Oct. 7, 1956).

Hunt, Samuel McPherson ("Sam Golf Bag"), U.S. gangland figure (b. Jasper, Ala.—d. Schenectady, N.Y., Aug. 19, 1956).

Hurley, Raymond Joseph, U.S. industrialist (b. Chicago, Ill., Jan. 4, 1895—d. Evanston, Ill., May 28, 1956).

Hutchinson, Paul, U.S. religious editor and author (b. Madison, N.J., Aug. 10, 1890—d. Beaumont, Tex., April 15, 1956), edited the influential Protestant journal *Christian Century* from 1947 until his retirement on Jan. 1, 1956, previously having been managing editor since 1924. Under his editorship the publication became internationally known for its liberal approach to political and economic issues, for its support of church unity and positive social action by religious leaders. Graduating from Lafayette college at Easton, Pa., in 1911, he entered religious journalism in 1914 as assistant editor of the *Epworth Herald*, weekly publication for Methodist youth. In 1915 he received a divinity degree from Garrett Biblical institute at Evanston, Ill., and the next year was appointed editor of the *China Christian Advocate* at Shanghai. He returned to the United States in 1921 and handled public relations for the Methodist missions for two years before joining *Christian Century*. Hutchinson was author of works on Methodism, Christianity generally and current national and international problems.

66 OBITUARIES: Rudolph Halley, U.S. lawyer; Jean Hersholt, U.S. actor; Marie Joliot-Curie, French physicist; Jesse H. Jones, U.S. government official; Charles T. Joy, U.S. admiral



Hutson, Frederick Leroy, U.S. educator (b. Pittsburgh, Pa., April 12, 1875—d. Hightstown, N.J., Aug. 28, 1956).

Hyde, Alexander C., U.S. composer (b. Hamburg, Ger., Feb. 17, 1898—d. Santa Monica, Calif., July 7, 1956).

Isaacs, Edith (Juliet) Rich (MRS. LEWIS MONTEFIORE ISAACS), U.S. editor and author (b. Milwaukee, Wis., March 27, 1878—d. White Plains, N.Y., Jan. 10, 1956).

Janis (Bierbower), Elsie, U.S. actress (b. Columbus, O., March 16, 1889—d. Beverly Hills, Calif., Feb. 26, 1956), was the first U.S. actress to entertain the American expeditionary forces in Europe during World War I. Her performances earned her the sobriquets of "sweetheart of the A.E.F.," "playgirl of the western front" and "idol of the army." Miss Janis made her stage debut at 8 years of age and scored her first Broadway success at 16. A versatile performer, she was also a talented mimic. She wrote many of her own routines, composed more than 50 popular songs and wrote a number of motion-picture scenarios. Her autobiography, *So Far, So Good*, was published in 1932.

Jenkins, David Abbot (Ab), U.S. politician and auto racing driver (b. Spanish Fork, Utah, Jan. 25, 1883—d. Milwaukee, Wis., Aug. 9, 1956).

Johnson, Charles Spurgeon, U.S. educator (b. Bristol, Va., July 24, 1893—d. Louisville, Ky., Oct. 27, 1956), was the first Negro president of Fisk university, founded for Negroes at Nashville, Tenn., in 1867 and later opened to all races. In this position, to which he was elected in 1946, Johnson became one of the United States' leading proponents of interracial amity. After graduating from The University of Chicago in 1917 and serving in World War I, he was a staff member of the Chicago Commission on Race Relations (1919-21) and later research director of the National Urban League in New York city. In 1928 he joined the faculty of Fisk, where he was instrumental in establishing the university's institute of race relations.

Johnson, Franklin Winslow, U.S. educator (b. Jay, Me., Aug. 17, 1870—d. Waterville, Me., Feb. 19, 1956).

Joliot-Curie, Irène, French physicist (b. Paris, Sept. 12, 1897—d. Paris, March 17, 1956), was the daughter of Pierre and Marie Sklodowska Curie, the discoverers of radium. Trained by her mother, she worked for her at the Institut de Radium, obtaining an unrivalled knowledge of the physical and chemical aspects of radioactivity. Her doctoral thesis (1925) was on the X-rays of polonium. (She was co-author, with Georges Boussières, of the article *POLONIUM* in *Encyclopædia Britannica*.) In 1926 she married Frédéric Joliot (later Joliot-Curie), an assistant to her mother. By their study (1932) of the radiation caused in beryllium by X-particles they reached the threshold of the discovery of the neutron. Systematic investigation (which had also marked the collaboration of her parents) led Irène and Frédéric to the discovery of "induced" or artificial radioactivity, announced in 1934. For this they were awarded the Nobel prize for chemistry in 1935. This work, and Irène's subsequent researches, were necessary steps toward the gaining of a knowledge of fission and atomic energy. She was under-secretary for scientific research (June-Sept. 1936) in Léon Blum's cabinet and in the same year she was made an officer of the Légion d'Honneur. From 1945 to 1951 she was a commissioner of the French atomic energy commission. Her husband, also a commissioner, was dismissed in 1950 for being a communist. Her death, through leukemia, was the result of prolonged exposure to radiation.

Jones, Isham, U.S. composer and orchestra leader (b. Coalton, O., Jan. 31, 1894—d. Hollywood, Fla., Oct. 19, 1956).

Jones, Jesse Holman, U.S. business executive and government official (b. Robertson county, Tenn., April 5, 1874—d. Houston, Tex., June 1, 1956), served as chairman of the Reconstruction Finance corporation, depression-born federal loan agency, 1933-45, during which time the RFC loaned private business and public agencies an estimated \$50,000,000,000. Jones was also secretary of commerce from 1940 until 1945, when he resigned at the request of Pres. Franklin D. Roosevelt, who named Henry A. Wallace to succeed him. Prior to his government service (he had also been a Red Cross official during World War I), Jones had amassed a fortune of several million dollars as a Texas lumber dealer, real estate operator and financier; he was also publisher of the *Houston Chronicle*. Jones was chairman of the Democratic party's finance committee from 1924 to 1928. Following his retirement from the cabinet in 1945 he returned to private business in Texas.

Joy, Charles Turner, U.S. naval officer (b. St. Louis, Mo., Feb. 17, 1895—d. San Diego, Calif., June 6, 1956), was head of the United Nations armistice delegation in Korea from July 1951 to May 1952, where he gained international attention for his refusal to yield to North Korean-Chinese Communist demands regarding disposition of prisoners and other phases of the Korean settlement. After graduating from the U.S. naval academy, Annapolis, Md., in 1916, Joy saw active naval service during World Wars I and II and in 1949 was appointed commander of U.S. naval forces in the far east. Following the Kaesong negotiations he was superintendent of the U.S. naval academy (1952-54).

Kaempffert, Waldemar Bernhard, U.S. science writer (b. New York, N.Y., Sept. 23, 1877—d. New York, N.Y., Nov. 28, 1956), spent most of his adult life writing for lay readers intelligible and accurate expositions of new technical and scientific developments. Taking a bachelor's degree from the City College of New York and a law degree from New York university (he was admitted to the bar but never practised law), Kaempffert was assistant editor of *Scientific American* from 1897 to 1911 and managing editor of that magazine from 1911 to 1915. For the next five years he was editor of the monthly *Popular Science*, then wrote free lance. In 1927 he was appointed science editor of the *New York Times*, holding this position until his death except for a period of three years (1928-31) when he was the first director of the Museum of Science and Industry in Chicago. Kaempffert's articles and books embraced all the physical and biological sciences. He was generally credited with having effectively introduced the proposal for co-operative research in cancer.

Karig, Walter, U.S. journalist and author (b. New York, N.Y., Nov. 13, 1898—d. Bethesda, Md., Sept. 30, 1956), was a co-author of *Battle Report*, a history in several volumes of the U.S. navy's part in World War II, upon which was based the TV series "Victory at Sea." He was also the author of several novels and books for children. Beginning his career as a sports writer, he later joined the staff of the *Newark* (N.J.) *Evening News* and was head of its Washington bureau from 1934. In World War I he served in the U.S., Polish and French armies. During World War II he saw naval combat service in the Mediterranean.

Kaye-Smith, Sheila (MRS. THEODORE PENROSE FRY), British novelist (b. Hastings, Eng., 1887—d. nr. Rye, Jan. 15, 1956).

Keeler, Stephen Edwards, U.S. Episcopal bishop (b. New Canaan, Conn., April 16, 1887—d. nr. Heidelberg, Ger., Sept. 25, 1956).

Kelly, Paul Michael, U.S. actor (b. Brooklyn, N.Y., Aug. 9, 1899—d. Beverly Hills, Calif., Nov. 6, 1956).

Kibbee, Guy Bridges, U.S. motion-picture actor (b. El Paso, Tex., March 6, 1886—d. East Islip, L.I., N.Y., May 24, 1956), appeared in stock company and vaudeville productions for a quarter century before achieving his first Broadway hit in 1930 (*Torch Song*) and his first motion-picture role (*Man of the World*) in 1931. His reputation for comic treatment of semiserious roles was by then solidly established, and he starred in more than 100 films. One of his best-known parts was that of "Scattergood Baines" in film versions of the popular stories by Clarence Budington Kelland.

Kilgore, Harley Martin, U.S. senator (b. Brown, W.Va., Jan. 11, 1893—d. Bethesda, Md., Feb. 28, 1956), was one of the last New Deal legislators, with a record of uniform support of Roosevelt and Truman policies from the time of his first election to the senate in 1940. Kilgore graduated from West Virginia university, Morgantown, in 1914 and was admitted to the state bar that year. Private practice at Beckley, W.Va., was interrupted by army service in World War I (1917-20) and by election as judge of the Raleigh county (W.Va.) criminal court in 1932. Kilgore was re-elected to the U.S. senate in 1946 and 1952, thus becoming the first West Virginia senator ever chosen for three successive terms. At the time of his death he was chairman of the senate judiciary committee.

King, Ernest Joseph, U.S. fleet admiral (b. Lorain, O., Nov. 23, 1878—d. Portsmouth, N.H., June 25, 1956), was commander in chief of the U.S. fleet during most of its participation in World War II (Dec. 1941 to Nov. 1945), and concurrently held the additional post of chief of naval operations (March 1942 to Dec. 1945). He was the first U.S. naval officer to hold both offices at the same time. His career spanned three wars. In the Spanish-American war he served on patrol duty in the Atlantic, and during World War I was assistant to the chief of staff of the U.S. fleet's commander in chief. A graduate of the U.S. naval academy, Annapolis, Md. (1901), he became rear admiral in 1933 and vice-admiral in 1938, and was advanced to the newly created rank of fleet admiral on Dec. 14, 1944, along with Adm. Chester W. Nimitz and Adm. William D. Leahy. King's global strategy as chief of naval operations during World War II was held to be largely responsible for the destruction of the Japanese fleet and merchant marine. He attended most of the high-level international conferences of the World War II period, including those at Yalta and Potsdam. After his retirement in Dec. 1945 he opposed the unification of the U.S. armed services.

Kinsey, Alfred Charles, U.S. biologist (b. Hoboken, N.J., June 23, 1894—d. Bloomington, Ind., Aug. 25, 1956), attained international fame with a single book, *Sexual Behavior in the Human Male* (1948), which, despite its unadorned statistical presentation, sold about 500,000 copies. The book was the tabulated result of personal interviews with about 5,000 men and boys in the United States, and was followed by *Sexual Behavior in the Human Female* (1953), based on interviews with about 6,000 women and girls. His findings, shocking to many and discounted by others, got wide publicity in the United States and abroad. Kinsey, a graduate of Bowdoin college, Brunswick, Me. (B.S., 1916), and of Harvard (Sc.D., 1920), taught zoology and botany at Harvard before joining the faculty of Indiana university as an assistant professor of zoology in 1920. He became full professor in 1929 and director of the university's institute for sex research in 1942. The latter was sponsored jointly with the university by the Rockefeller foundation (until 1954) and the National Research council.

Kirby, Gustave Town, U.S. sportsman, inventor and lawyer (b. Philadelphia, Pa., Jan. 22, 1874—d. Bedford Hills, N.Y., Feb. 27, 1956).

Kleiber, Erich, Austrian-born orchestra conductor (b. Vienna, Aus., Aug. 5, 1890—d. Zurich, Switz., Jan. 27, 1956).

Knight, Frank A., U.S. newspaperman (b. Chicago, Ill., Oct. 4, 1907—d. Charleston, W.Va., July 6, 1956).

Konchalovsky, Pyotr P., Russian painter (b. 1876—d. announced Moscow, U.S.S.R., Feb. 3, 1956).

Korda, Sir Alexander, British motion-picture producer (b. Turkeve, Hung., Sept. 16, 1893—d. London, Jan. 24, 1956), was a leading figure in the motion-picture industry in Great Britain, the United States and Europe and made major contributions to its development. He was educated at the Reformist college and the Royal university, Budapest, Hung. Before he was 20 he entered journalism but the challenge presented by motion pictures in their infancy attracted him and he left newspaper work to rent a small building outside Budapest which became his studio. He bought a camera, wrote scripts and began producing films. He soon found work as a director with Sascha Films, a pioneer firm in Vienna. *The Prince and the Pauper*, his first production, was praised for the improved technique, experimental approach and high standard it represented. From Vienna he went to Berlin where he made several films for the UFA studios and attracted the attention of Hollywood (Calif.), by then the most important motion-picture centre. He served as a director for leading Hollywood companies but, discouraged and dissatisfied by their reluctance to give his talents free rein, he returned to Europe. Finding himself in Paris with little money at a time when the European companies were having financial difficulties, he nevertheless attempted, with some friends, to launch a new studio. Paramount then asked him to direct its work in Europe. He accepted and moved to London and the Elstree studios, where he made *Service for Ladies* (1931), which

brought immediate fame. Soon after this triumph, he founded his own firm, London Film Productions which in 1943 amalgamated with the Metro-Goldwyn-Mayer British Studios, Ltd., Korda becoming chairman and managing director of the new undertaking. After World War II he broke away from M-G-M, and London Film Productions resumed independent existence with Korda at its head. His productions included *The Scarlet Pimpernel* (1935), *Catherine the Great* (1934), *The Private Life of Henry VIII* (1933), *The Shape of Things to Come* (1936), *The Third Man* (1949), *The Fallen Idol* (1948), *The Wooden Horse* (1950), *Seven Days in Noon* (1950) and *The Sound Barrier* (1952). He was knighted in 1942.

Farge, Christopher, U.S. author (b. New York, N.Y., Dec. 10, 1897—d. Providence, R.I., Jan. 5, 1956), revived the novel-in-verse literary form with success in his first book, *Hoxsie Sells His Acres* (1934) and later works. *The Sudden Guest* (1946), set in New England during the hurricane of 1938, was a fiction best seller in the United States. La Farge prepared for an architectural career at the Pennsylvania School of Architecture after his graduation from Harvard university in 1920. He was a practising architect in New York city (1924–32) before abandoning that profession to spend his full time writing. He was also a painter of merit. His other books include *Each to the Other* (1939), *Poems and Portraits* (1940), *East by Southwest* (1944), *Mesa Verde* (1945) and *Beauty for Ashes* (1953).

Lane, Arthur Bliss, U.S. diplomat (b. Bay Ridge, L.I., N.Y., June 16, 1894—d. New York, N.Y., Aug. 12, 1956), occupied key foreign service posts for the United States during and after World War II. As the first postwar ambassador to Poland, Lane repeatedly called U.S. attention to the Communist stranglehold on that nation. In 1947 he returned to private life to devote all his time to anti-Communist activities, including publication of *How Russia Rules Poland* (1947) and *I Saw Poland Betrayed* (1948). Educated in Paris, Fr., and at Yale university (B.A., 1916), Lane entered the U.S. foreign service in 1916 and held a number of diplomatic posts in Europe, Mexico and Nicaragua prior to his appointment as ambassador to the three Baltic states of Lithuania, Latvia and Estonia in 1936. The next year he was named ambassador to Yugoslavia, and there witnessed the German occupation of Belgrade in 1941, after King Peter (with his backing) had renounced Yugoslavia's ties with the axis. Following his return to the U.S., Lane was minister to Costa Rica, then ambassador to Colombia, and in Sept. 1944 was appointed ambassador to the Polish exile government in London.

Langford, Sam, U.S. boxer (b. 1880?—d. Cambridge, Mass., Jan. 12, 1956).

Lang, Charles Downing, U.S. landscape architect (b. Newburgh, N.Y., Sept. 3, 1877—d. Stratford, Conn., Feb. 15, 1956).

Lynton, John (Johnny), U.S. billiards player (b. 1886?—d. St. Louis, Mo., Jan. 18, 1956).

Mason, Spencer Stottisbury Gwatkin, British Anglican bishop (b. Twickenham, Eng., Oct. 9, 1892—d. London, Jan. 27, 1956).

Prince, Joseph Albert Augustin, U.S. sanitary engineer (b. Leeds, Eng., Aug. 8, 1875—d. Memphis, Tenn., Feb. 10, 1956).

Rick, Harry, U.S. song writer (b. Philadelphia, Pa., Jan. 25, 1896—d. New York, N.Y., July 5, 1956).

Ree, "Little Jack" (JOHN LEONARD), U.S. singer and pianist (b. London, Eng., May 28, 1900—d. Hollywood, Fla., April 9, 1956).

Reddale, Clara Savage (MRS. HAROLD A. LITLEDIALE), U.S. editor (b. Belfast, Me., Jan. 31, 1891—d. New York, N.Y., Jan. 9, 1956).

Lonardi, Eduardo, Argentine army officer (b. Entre Rios province, Arg., Sept. 15, 1896—d. Buenos Aires, March 22, 1956), won his niche in history during a brief two-month period in 1955 as leader of the military revolution that ousted Juan Perón as dictator of Argentina. Lonardi was proclaimed provisional president Sept. 23 but was ousted by the army Nov. 13 and succeeded by Gen. Pedro Aramburu. After several weeks in the United States he returned to Argentina a short time before his death. Lonardi, a graduate of Argentina's military academy, was military attaché in Washington, D.C., for a few months after World War II and later served as commander of the Argentine third army. Open criticism of the Perón regime led to his forced retirement in 1951, and thereafter he led several movements to overthrow Perón prior to the successful coup of Sept. 16–19, 1955.

Wett, Robert Morss, U.S. educator (b. Boston, Mass., Dec. 25, 1870—d. Chicago, Ill., Feb. 8, 1956).

Blasko, Bela, Hungarian-born actor (b. Lugos, Hung. [later Rum.], Oct. 20, 1888—d. Los Angeles, Calif., Aug. 16, 1956), was in 1913 the leading actor of the Royal National theatre, Budapest. After 1918 he left Hungary, and in 1922 appeared on the New York stage. Still in the United States, two years later he turned to motion pictures. He appeared as the vampire Dracula (on both stage and screen) and continued his ghoulish portrayals in *Murders in the Rue Morgue* and the *Frankenstein* films. In 1944 he returned to the stage, touring the United States in *Arsenic and Old Lace*.

Ward, William Edward, U.S. educator (b. Lisbon, Me., Jan. 13, 1882—d. Haverford, Pa., Nov. 10, 1956).

Ward, Douglas Ellsworth, U.S. editor and author (b. Monticello, Minn., June 9, 1897—d. White Plains, N.Y., Aug. 27, 1956).

MacArthur, Charles, U.S. playwright (b. Scranton, Pa., Nov. 5, 1895—d. New York, N.Y., April 21, 1956), combined wit, fast action and cynicism to turn out plays such as *The Front Page* (with Ben Hecht, 1928), a boisterous account of Chicago newspaperdom in prohibition days. *The Front Page*, which reflected its authors' careers, was followed by other plays and a series of successful motion-picture scenarios including *The Sin of Madelon Claudet* (1931) starring Helen Hayes, whom MacArthur had married in 1928. MacArthur began his journalistic career in 1914 at Chicago and continued as a reporter there and in New York city until 1923, except for military service on the Mexican border in 1916 and with the United States forces in France during World War I. In addition to plays co-written with Hecht, Sidney Howard and Edward Sheldon, MacArthur was sole author of *Johnny on a Spot* (1941). One of his best-known motion-picture adaptations was *Wuthering Heights*. For a few years prior to 1950 he was editor of *Theatre Arts*.

McCord, Alvin Carr, U.S. inventor and industrialist (b. Paris, Ill., Nov. 24, 1867—d. Detroit, Mich., Aug. 6, 1956).

McCormick, Lynde Dupuy, U.S. naval officer (b. Annapolis, Md., Aug. 12, 1895—d. Newport, R.I., Aug. 16, 1956).

Macelwane, James Bernard, U.S. geophysicist and educator (b. nr. Port Clinton, O., Sept. 28, 1883—d. St. Louis, Mo., Feb. 15, 1956).

Macfarland, Charles Stedman, U.S. diplomat and clergyman (b. Boston, Mass., Dec. 12, 1866—d. Mountain Lakes, N.J., Oct. 26, 1956).

Mack, Connie (CORNELIUS ALEXANDER MCGILLICUDDY), U.S. baseball manager (b. East Brookfield, Mass., Dec. 23, 1862—d. Philadelphia, Pa., Feb. 8, 1956), was the "grand old man" of U.S. baseball in the first half of the 20th century, managing the Philadelphia Athletics from 1901 to 1950. Nine times during that period his team won the American league pennant and five times the world championship (1910, 1911, 1913, 1929 and 1930). Twice Mack broke up pennant-winning teams—after the 1905 and 1914 seasons—to start afresh with practically new playing talent. Mack entered baseball with his native town team in 1883 as a catcher, moving the next year to Meriden, Conn. In 1885 he transferred to the Hartford (Conn.) team of the New England league, in 1886 to the Washington, D.C., club of the old National league, and in 1890 to Buffalo, N.Y. (Brotherhood league). From 1891 to 1896 he played with, and then managed, Pittsburgh in the National league, and during the next four seasons was catcher-manager of the Milwaukee (Wis.) club of the Western association. After he became manager and part owner of the Athletics in 1901 he retired as an active player. Gradually he acquired ownership of the team. In 1954, at the age of 91, he sold the Athletics, whose American league franchise was then transferred to Kansas City, Mo. Mack was among the first 13 immortals elected to baseball's hall of fame, opened in 1939, at Cooperstown, N.Y. He was known as one of the game's greatest strategists.

MacKaye, Percy, U.S. poet-dramatist (b. New York, N.Y., March 16, 1875—d. Cornish, N.H., Aug. 31, 1956), was a prolific writer, an innovator of new forms of drama and an authority on Shakespeare. His cycle of four plays, *The Mystery of Hamlet, King of Denmark*, was staged at the Pasadena (Calif.) playhouse in 1949. MacKaye, who graduated from Harvard university in 1897, was the recipient of a number of honours and awards in poetry. (See also *Encyclopædia Britannica*.)

McKelvie, Sam Roy, U.S. editor, publisher and politician (b. Fairfield, Neb., April 15, 1881—d. nr. Mesa, Ariz., Jan. 6, 1956).

McKinney, Madge Maude, U.S. educator (b. Rome, O., Nov. 21, 1893—d. New York, N.Y., July 29, 1956).

McNulty, John Augustin, U.S. author (b. Lawrence, Mass., 1895—d. Wakefield, R.I., July 29, 1956).

Mankin, Mrs. Helen Douglas, U.S. legislator (b. Atlanta, Ga., Sept. 11, 1896—d. Atlanta, July 26, 1956).

Marchal, Léon, French diplomat (b. Badonviller, Fr., June 8, 1900—d. Strasbourg, Sept. 24, 1956).

Marcus, Ruth, U.S. educator (b. San Francisco, Calif., Aug. 17, 1900—d. Chicago, Ill., Dec. 25, 1956).

Margolin, Arnold D., Russian-U.S. jurist and author (b. Kiev, U.S.S.R., Nov. 17, 1877—d. Washington, D.C., Oct. 30, 1956).

Marie Louise (FRANZISCA JOSEPHA LOUISE AUGUSTA MARIE CHRISTIANA HELENA), British princess (b. London, Aug. 12, 1872—d. London, Dec. 8, 1956), was a daughter of Princess Helena Augusta Victoria and Prince Christian of Schleswig-Holstein and a granddaughter of Queen Victoria. In 1891 she married Prince Aribert of Anhalt but returned to England on the dissolution of her marriage in 1900. Thereafter she spent the greater part of her life in serving the community as a member of committees and in philanthropic activities which reflected her kindly and capable personality. The charities which benefited from her interest included University College hospital, the Friends of the Poor and the South Eastern Hospital for Children. The princess moved in a broad range of society, and refused to be unduly bound by the conventions of the past. Her publications comprised letters written to her sister Princess Helena Victoria in 1925 from West Africa and *My Memories of Six Reigns*, published shortly before her death.

Marks, Percy, U.S. novelist and educator (b. Covelo, Calif., Sept. 9, 1891—d. New Haven, Conn., Dec. 27, 1956).

Martínez, Luis María, Mexican Catholic archbishop (b. Molino de Caballeros, Michoacán, Mex., June 9, 1881—d. Mexico City, Feb. 9, 1956), was the first to hold the title of Roman Catholic primate of Mexico. His liberal sentiments and strong anti-Fascism helped restore amicable church-state relations in Mexico after years of mutual recrimination. Martínez was educated at the Morelia (Michoacán) seminary and was ordained to the priesthood in 1904. Thereafter he taught at the Morelia seminary and became its rector. In 1923 he was named a titular bishop and in 1934 titular archbishop of Mistia. On Feb. 20, 1937, he was appointed archbishop of Mexico.

Mason, Maud M., U.S. painter (b. Russellville, Ky., March 18, 1867—d. New York, N.Y., Aug. 28, 1956).

Mead, Edward Sherwood, U.S. educator and author (b. Medina, O., Jan. 25, 1874—d. Philadelphia, Pa., Aug. 21, 1956).

Mencken, H(enry) L(ouis), U.S. author, editor and philologist (b. Baltimore, Md., Sept. 12, 1880—d. Baltimore, Jan. 29, 1956), provoked more controversy than any other U.S. literary figure of the first half of the 20th century, with the possible exception of Sinclair Lewis. His attacks on the U.S. middle class ("booboisie"), prudery and Fundamentalism ("Bible belt") and sham and mediocrity in literature brought him fame and contumely as early as 1910, and his influence was still strong 25 years later. Mencken's formal education ended with high school. He was hired as a reporter for the *Baltimore Morning Herald* in 1899 and four years later was city editor. In 1906 he went to the *Baltimore Sun*, beginning an association with the Sunpapers that lasted off and on for the next 50 years. With George Jean Nathan he was editor of the iconoclastic magazine *Smart Set* from 1914 to 1923; from 1924 to 1933 he edited the famous *American Mercury*. These two magazines helped establish the reputations of such U.S. authors as

Theodore Dreiser, Sinclair Lewis, Edgar Lee Masters, James Branch Cabell and Sherwood Anderson. Among the 45 or more books of which Mencken, the "sage of Baltimore," was author, co-author, editor or translator, the most ambitious was *The American Language*, published in several editions and supplements. Mencken described the labour involved as formidable and appalling. Of his other books, the series of *Prejudices*, collections of essays (the first published in 1919 and the sixth and last in 1927), were perhaps most widely read and quoted. Mencken's *Minority Report* (1956) was published posthumously. He had retired in 1948.

Merkle, Fred(erick Charles), U.S. baseball player (b. Watertown, Wis., Dec. 20, 1888—d. Daytona Beach, Fla., March 2, 1956).

Merrill, Charles Edward, U.S. investment banker and stockbroker (b. Green Cove Springs, Fla., Oct. 19, 1885—d. Southampton, L.I., N.Y., Oct. 6, 1956), founded in 1914 the firm which ultimately became, after many mergers, one of the largest brokerage companies in the world—Merrill Lynch, Pierce, Fenner & Beane. Merrill was one of a few brokers who foresaw the stock market crash of Oct. 1929, and so counselled his clients. His firm underwrote the capital of some of the largest corporations in the United States, including S. S. Kresge company, Superior Steel and Safeway stores. The firm also pioneered efforts to interest small investors in buying private securities.

Miklas, Wilhelm, Austrian statesman (b. Krems, Lower Austria, Oct. 15, 1872—d. Vienna, March 20, 1956), was educated at Vienna university and became a school teacher at Trieste and later at Horn, which he represented in the Austrian *Reichsrat* (parliament), 1907-18 and again in 1920. A leading Christian Democrat, he was president of the Austrian republic during 1923-27 and from Dec. 5, 1928, to March 13, 1938 (being re-elected on Oct. 9, 1931). During the *Anschluss* crisis he refused to approve the annexation of Austria to Germany.

Miles, Alfred Hart, U.S. naval officer (b. Norfolk, Va., Nov. 2, 1883—d. Norfolk, Oct. 6, 1956).

Milne, A(Ian) A(lexander), British author and playwright (b. London, Jan. 18, 1882—d. Hartfield, Sussex, Jan. 31, 1956), was educated at Westminster and at Trinity college, Cambridge, where as editor of *Granta* he first showed talent for writing. He was assistant editor of *Punch*, 1906-14, and became known as a humorist in his own right. Invalided out of the army during World War I, his play *Wurzel Flummery*, completed in 1917, was the first of many successes; *Mr. Pim Passes By* (1919), *The Romantic Age* (1920), *The Dover Road* (1922), *The Fourth Wall* (1928), a skilful, murder play, and *Toad of Toad Hall* (1930), an adaptation of Kenneth Grahame's *The Wind in the Willows*, followed. He specialized in light comedy and his plays were interwoven with wit and fantasy. A. A. Milne is best known, however, for his nursery verses and stories, which have a world-wide appeal to children and adults alike. His nursery classics, *Winnie-the-Pooh* (1926) and *The House at Pooh Corner* (1928), won his bear "Pooh" international renown. His Christopher Robin books of verse, *When We Were Very Young* (1924) and *Now We Are Six* (1927), are equally well known. In 1934 he wrote *Peace With Honour*, a vigorous plea against war; and his autobiography, *It's Too Late Now*, was published in 1939. In later years his short stories were well received both in the U.S. and in England. *Year In, Year Out* (1952) was his last work.

Mistinguett (JEANNE BOURGEOIS), French singer and dancer (b. La Pointe de Raquet, Fr.—d. Bougival, Jan. 5, 1956).

Mitchell, David, U.S. psychologist and educator (b. Aldershot, Can., Oct. 13, 1884—d. New Milford, Conn., July 14, 1956).

Moffat, Douglas Maxwell, U.S. diplomat and attorney (b. Stanhope, N.J., Nov. 16, 1881—d. Canberra, Austr., Aug. 30, 1956).

Molloy, Thomas Edmund, U.S. Roman Catholic prelate (b. Nashua, N.H., Sept. 4, 1885—d. Brooklyn, N.Y., Nov. 26, 1956).

Moore, Ethelbert Allen, U.S. industrialist and author (b. Kensington, Conn., Nov. 30, 1864—d. Ormond Beach, Fla., Feb. 13, 1956).

Moore, George Thomas, U.S. botanist (b. Indianapolis, Ind., Feb. 23, 1871—d. St. Louis, Mo., Nov. 27, 1956).

Morgan, Ralph (RALPH WUPPERMAN), U.S. actor (b. New York, N.Y., July 6, 1888—d. New York, June 11, 1956).

Moscadé Iruarte, José, Spanish army officer (b. Madrid, Oct. 26, 1878—d. Laredo, near Santander, April 12, 1956).

Mulford, Clarence Edward, U.S. author (b. Streator, Ill., Feb. 3, 1883—d. Portland, Me., May 10, 1956).

Murfin, Orin Gould, U.S. naval officer (b. Ohio Furnace, O., April 13, 1876—d. San Diego, Calif., Oct. 22, 1956).

Murray, John Gregory, U.S. Roman Catholic prelate (b. Waterbury, Conn., Feb. 26, 1877—d. St. Paul, Minn., Oct. 11, 1956).

Murray, William Henry ("Alfalfa Bill"), U.S. governor (b. Collinsville, Tex., Nov. 21, 1869—d. Oklahoma City, Okla., Oct. 15, 1956), was one of the most colourful and tempestuous political figures of the 1930s, particularly because of his frequent denunciations of Pres. Franklin D. Roosevelt and because of his unorthodox manner of enforcing many of his measures as governor of Oklahoma (1931-35) by calling out the national guard. Murray had served as chairman of Oklahoma's constitutional convention in 1907, when the state was admitted to the union, and was a member of the U.S. house of representatives (1913-17).

Myers, William Starr, U.S. educator and author (b. Baltimore, Md., June 17, 1877—d. Princeton, N.J., Jan. 27, 1956).

Neuberg, Carl Alexander, U.S. biochemist (b. Hanover, Ger., July 29, 1877—d. New York, N.Y., May 30, 1956).

Neurath, Konstantin von, German statesman (b. Klein-Gratbach, Württemberg, Ger., Feb. 2, 1873—d. Enzweihingen, Aug. 14, 1956).

Newcomb, Kate Pelham, U.S. physician (b. Wellington, Kan., July 26, 1886—d. Wausau, Wis., May 30, 1956).

Newton, Robert, British actor (b. Shaftesbury, Dorset, Eng., June 1, 1905—d. Beverly Hills, Calif., March 25, 1956).

Nixon, Paul, U.S. educator (b. Des Moines, Ia., May 23, 1882—d. West Harpswell, Me., Oct. 27, 1956).

Nolan, Dennis Edward, U.S. army officer (b. Akron, N.Y., April 22, 1872—d. New York, N.Y., Feb. 24, 1956).

Noonan, Herbert C., U.S. Jesuit educator (b. Oconto, Wis., Sept. 7, 1875—d. Omaha, Neb., July 6, 1956).

Novikoff, Laurent, Russian dancer and ballet master (b. Moscow, U.S.S.R., 1888—d. New Buffalo, Mich., June 18, 1956).

Nufer, Albert F., U.S. diplomat (b. New York, N.Y., Oct. 21, 1894—d. Manila, P.I., Nov. 6, 1956).

Obermann, Julian Joel, U.S. educator (b. Warsaw, Pol., June 14, 1888—d. New Haven, Conn., Oct. 17, 1956).

Ofstie, Ralph Andrew, U.S. naval officer (b. Eau Claire, Wis., Nov. 16, 1897—d. Bethesda, Md., Nov. 18, 1956).

Ogata, Taketora, Japanese editor and political leader (b. Fukuoka, Jap., Jan. 30, 1888—d. Tokyo, Jan. 28, 1956), spent most of his career as a journalist (reporter for the Asahi chain of dailies from 1911 and chief editor from 1934) before his appointment in 1944 as minister of state and later propaganda minister in the struggling Japanese cabinets of the last months of World War II. From 1945 to 1947 he was interned by order of Gen. Douglas MacArthur but was permitted to resume political activities in 1951. He was deputy premier under Shigeru Yoshida and in Nov. 1955 helped form the new Liberal Democratic party which returned Premier Ichiro Hatoyama to power. An ardent anti-Communist, Ogata became second man of the party and at the time of his death was believed to be next in line to succeed Hatoyama.

O'Hara, Edwin Vincent, U.S. Roman Catholic prelate (b. Lanesboro, Minn., Sept. 6, 1881—d. Milan, It., Sept. 11, 1956).

Olin, Robert (Bob), U.S. boxer (b. New York, N.Y., July 4, 1908—d. New York, Dec. 16, 1956).

Olsted, James Montrose Duncan, U.S. physiologist (b. Lake City, Ia., May 21, 1886—d. Berkeley, Calif., May 25, 1956).

Oppenheimer, Louis, British diamond mining company executive (b. Friedberg, Ger.—d. Gerrard's Cross, Eng., Jan. 19, 1956).

Ortner, Hermann Heinz, Austrian dramatist (b. Bad Kreuzen, Upper Aus., Nov. 4, 1895—d. Salzburg, Aug. 18, 1956).

O'Shaughnessy, Thomas Augustin, U.S. mural artist (b. Chariton Cty., Mo., April 14, 1870—d. Chicago, Ill., Feb. 12, 1956).

Oxx, Francis Hudson, U.S. army officer (b. Jamestown, R.I., Sept. 13, 1898—d. Frederick, Md., Feb. 15, 1956).

Paasikivi, Juho Kusti, Finnish statesman (b. Tampere, Fin., Nov. 27, 1870—d. Helsinki, Dec. 14, 1956), was elected president of Finland in March 1946 and after being re-elected in 1950 he continued in office until Feb. 1956. He studied law at Stockholm, Uppsala and Leipzig universities and from 1899-1902 was a lecturer in law at Helsinki university, subsequently entering the banking and insurance business. In 1907 he was elected a member of the Finnish *Eduskunta* (diet) and the following year became minister of finance in the semiautonomous government of the grand duchy of Finland. After the Russian revolution and Finland's declaration of independence, he headed the Finnish delegation which on Oct. 14, 1920, signed at Tartu, Estonia, the peace treaty with the U.S.S.R. In independent Finland Paasikivi became prominent as a banker and businessman. Shortly before World War II he was appointed minister to Sweden. He was recalled from Stockholm in Oct. 1939 to lead the delegation which unsuccessfully attempted to reach a peaceful settlement with the U.S.S.R. In March 1940 he negotiated peace and in April was appointed minister to Moscow, resigning from this position in May 1941. Disagreeing with government policy he virtually retired from politics from 1941 to Nov. 1944 when he became prime minister of a government pledged to peaceful co-operation with the U.S.S.R. He succeeded Marshal C. G. Mannerheim as president in March 1946. In 1948, he agreed to conclude a treaty of mutual assistance with the U.S.S.R. but although pursuing a policy of co-operation with this powerful neighbour he firmly resisted Communist penetration in Finland. Yet, despite his lack of sympathy with communism, he was awarded in Sept. 1954 one of the highest of Soviet distinctions, the Order of Lenin.

Papini, Giovanni, Italian author and philosopher (b. Florence, It., Jan. 9, 1881—d. Florence, July 8, 1956).

Parshall, De Witt, U.S. artist (b. Buffalo, N.Y., Aug. 2, 1864—d. Santa Barbara, Calif., July 7, 1956).

Patterson, Grover Hiram, U.S. editor (b. Rochester, Minn., Nov. 5, 1881—d. Toledo, O., Aug. 7, 1956).

1956 OBITUARIES: Harley M. Kilgore, U.S. senator; Ernest J. King, U.S. admiral; Alfred C. Kinsey, U.S. biologist; Eduardo Lonardi, Argentine army officer; Bela Lugosi, U.S. actor



Harrison, Paul Linton, U.S. lawyer and legislator (b. Kent, O., July 18, 1900—d. Portland, Ore., Jan. 31, 1956).
Hack, Randolph Everghim, U.S. attorney and government official (b. Hackensack, N.J., Aug. 8, 1890—d. Washington, D.C., Feb. 6, 1956).
Merosi, Lorenzo, Italian composer of religious music (b. Tortona, It., Dec. 20, 1872—d. Rome, Oct. 12, 1956).
Metegorsky, David W., U.S. political scientist (b. Ottawa, Ont., May 31, 1915—d. New York, N.Y., July 15, 1956).
Petersen, Martin, U.S. artist (b. Denmark, Nov. 23, 1866—d. New York, N.Y., Nov. 20, 1956).
Hillips, Fred, U.S. musician and song writer (b. Boston, Mass., Oct. 17, 1890—d. Bethpage, N.Y., Oct. 13, 1956).
Hillips, Thomas Wharton, Jr., U.S. businessman and congressman (b. New Castle, Pa., Nov. 21, 1874—d. Butler, Pa., Jan. 2, 1956).

Pick, Lewis Andrew, U.S. army officer and engineer (b. Brookneal, Va., Nov. 18, 1890—d. Washington, D.C., Dec. 2, 1956), directed the construction of such engineering feats as the Ledo supply road to China from India and Burma in World War II, the U.S. strategic air base at Thule, Greenland, and a number of multipurpose dams and reservoirs in the Missouri river valley of the United States. Graduating from Virginia Polytechnic institute in 1914 and from the army engineers school at Ft. Belvoir, Va., in 1924, Pick was an engineers officer in France during World War I, and by 1951 had advanced to the rank of lieutenant general. He was chief of the U.S. army engineers from March 1949 to Feb. 1953. The 478-mi. Ledo road, familiarly known to Pick's subordinates as "Pick's Pike," was built under seemingly impossible conditions of jungle and mountain and was a major logistics factor in the defeat of Japan in World War II. After the war Pick took over the Pick-Sloan plan, a project he had co-authored with the U.S. bureau of reclamation several years before, to control floods and provide irrigation in the Missouri river basin.

Sis, Filippo de, Italian painter (b. Ferrara, It., May 11, 1896—d. Milan, April 2, 1956).

Pollock, Jackson, U.S. artist (b. Cody, Wyo., Jan. 28, 1912—d. East Hampton, L.I., N.Y., Aug. 11, 1956), was perhaps the most controversial American painter of his time, and one of the most widely imitated among younger artists. His career fell roughly into four parts. The earliest, in the 1930s, was a period of realism and naturalism after the style of Thomas Hart Benton, under whom Pollock had studied at the Art Students league in New York city (1929-31). In his second stage of development, in the middle 1940s, he turned to expressionism and abstraction. The third stage (about 1947-50) made him the vortex of a storm in the art world. With his canvases tacked to the floor, he dripped paint on them in successive layers, often mixed with sand, creating rhythmic and colourful designs. His fourth and last period was marked by a return to more conventional techniques, including use of the brush, with his colours limited mostly to brown and black. Pollock held a number of one-man shows in New York city, Chicago and San Francisco. His paintings were exhibited in the principal galleries of the United States, bringing prices to \$10,000. He was killed in an automobile accident near his home.

Spe, Mildred Katharine, British educator (b. Paddock Wood?, Kent, Eng., Jan. 28, 1872—d. Oxford, Sept. 16, 1956).
Porter, Lew (Lewis John Tableporter), U.S. composer (b. New York, N.Y., Feb. 4, 1892—d. N. Hollywood, Calif., Jan. 29, 1956).
Post, Charles Johnson, U.S. author and government official (b. New York, N.Y., Aug. 27, 1873—d. New York, Sept. 25, 1956).
Post, Charles Edwin, U.S. businessman (b. Brooklyn, N.Y., July 3, 1873—d. New York, N.Y., Aug. 28, 1956).
Revel, Harford, U.S. author and editor (b. Philadelphia, Pa., Aug. 20, 1887—d. Concord, Mass., Aug. 17, 1956).
Rampoloni, Enrico, Italian painter (b. Modena, It., 1894—d. Rome, June 17, 1956).
Ruff, Charles, U.S. educator (b. Brooklyn, N.Y., Oct. 13, 1892—d. New York, N.Y., Jan. 7, 1956).

Ruff, Fletcher, U.S. author (b. Buffalo, N.Y., April 25, 1897—d. Long Branch, N.J., June 10, 1956), was known primarily as a naval historian (*Preble's Boys*, *The Monitor and the Merrimac*, *Fleet Against Japan*), although his versatility also led him to write in such diverse fields as science fiction, cooking, mediaeval history, cryptography and translations. During World War II he was a military writer for the *New York Post*. His *Ordeal by Fire* (1935), a history of the American Civil War, won wide acclaim.

West, James Percy, U.S. legislator (b. Carters Creek, Tenn., April 1, 1900—d. Nashville, Tenn., Oct. 12, 1956).
Wouty, Jed, U.S. actor (b. Boston, Mass., 1879?—d. New York, N.Y., May 10, 1956).

Quirino, Elpidio, second president of the Philippine republic (b. Vigan, P.I., Nov. 16, 1890—d. Novaliches, near Manila, P.I., Feb. 28, 1956), succeeded the first president, Manuel Roxas y Acuna, upon the latter's death April 15, 1948, then was re-elected to a full four-year term in 1949. He was defeated for another term by Ramon Magsaysay in 1953, and re-

tired from office early the next year. Quirino's six years as president were marked by notable post-World War II reconstruction progress and by general economic gains, although members of his administration were accused of corruption in office—a fact that contributed to his 1953 defeat despite his vigorous campaigning in the midst of serious illness. Quirino attended the University of the Philippines and in 1915 was admitted to the bar. In 1917 he was appointed secretary to Manuel Quezon, who later was to become first head of the new Philippine commonwealth (1935). Two years later he was elected to the Philippine congress, and from 1925 to 1935 he was a senator, becoming floor leader and delegate to the constituent assembly of 1934-35. In Quezon's commonwealth government Quirino was secretary of finance and later secretary of the interior. Imprisoned by the Japanese during World War II, Quirino suffered a great personal tragedy when his wife and three of their children were slain by the occupiers shortly before the liberation of Manila early in 1945. After the war Quirino was president *pro tem* of the Philippine senate and vice-president under Roxas. In the latter office he was also secretary of finance and first secretary of foreign affairs.

Raemaekers, Louis, Dutch cartoonist (b. Roermond, Neth., April 6, 1869—d. Scheveningen, July 26, 1956).
Rankine, Alexander Oliver, British physicist (b. Guildford, Eng., 1881—d. London, Jan. 19, 1956).
Raudenbush, George King, U.S. composer and musical conductor (b. Jersey Shore, Pa., March 13, 1899—d. San Diego, Calif., May 26, 1956).

Raymond, Alexander Gillespie, U.S. cartoonist (b. New Rochelle, N.Y., Oct. 2, 1909—d. near Westport, Conn., Sept. 6, 1956), was the creator of several newspaper comic strips, including "Flash Gordon," "Jungle Jim," "Rip Kirby," and (with Dashiell Hammett) "Secret Agent X-9." Raymond began his career as a stockbroker's clerk, and after an apprenticeship as a feature artist (1930-32) launched his first successful strip in 1934. He was a combat artist with the U.S. marines in World War II.

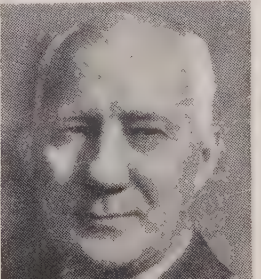
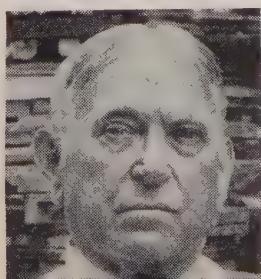
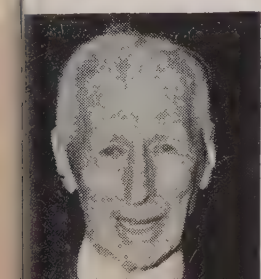
Reed, Chauncey William, U.S. congressman (b. West Chicago, Ill., June 2, 1890—d. Washington, D.C., Feb. 9, 1956), was a leading Republican member of the midwest conservative bloc during his tenure as representative from the 14th (formerly 11th) Illinois district (1935 until his death). Admitted to the Illinois bar in 1915, he was state's attorney of Du Page county, Ill., before his election to the U.S. congress in 1934. In the 83rd congress (1953-54) Reed was chairman of the house of representatives judiciary committee.

Rentschler, Frederick B(rant), U.S. aircraft manufacturer (b. Hamilton, O., Nov. 8, 1887—d. Boca Raton, Fla., April 25, 1956).
Rhodes, Sir (Robert) Heaton, New Zealand statesman (b. Purau, Lyttelton, N.Z., Feb. 27, 1861—d. Christchurch, July 30, 1956).
Ricard, Pierre-René, French industrialist (b. Cannes, Fr., April 3, 1899—d. Paris, April 4, 1956).
Rice, Alexander Hamilton, U.S. explorer and physician (b. Boston, Mass., Aug. 29, 1875—d. Newport, R.I., July 23, 1956).
Rich, Frederic Efram (Freddie), U.S. orchestra leader (b. Warsaw, Pol., Jan. 3, 1898—d. Beverly Hills, Calif., Sept. 8, 1956).
Richter, Irma Anne, British artist (b. Paris, Fr., 1876—d. Rome, It., Feb. 8, 1956).
Ridley, Henry Nicholas, British botanist (b. Norfolk, Eng., Dec. 10, 1855—d. London, Oct. 24, 1956).
Rist, Edouard, French bacteriologist (b. Strasbourg, Fr., March 16, 1871—d. Paris, announced April 14, 1956).
Robinson, Orin Pomeroy, Jr., U.S. submarine builder (b. Corning, N.Y., July 17, 1891—d. New London, Conn., Feb. 27, 1956).
Rodgers, Cleveland, U.S. editor and author (b. Greenville, S.C., March 3, 1885—d. New York, N.Y., May 21, 1956).
Rosenberg, Israel, U.S. rabbi (b. Lomza, Pol., March 15, 1875—d. New York, N.Y., Jan. 26, 1956).
Royden, (Agnes) Maude (Mrs. George William Hudson Shaw), British social worker and preacher (b. Birkenhead, Eng., Nov. 23, 1876—d. London, July 30, 1956).
Rumshinsky, Joseph (M.), U.S. composer and pianist (b. Vilna, U.S.S.R., April 9, 1881—d. New York, N.Y., Feb. 6, 1956).
Runbeck, Margaret Lee, U.S. author (b. Des Moines, Ia., Jan. 25, 1910—d. Beverly Hills, Calif., Sept. 30, 1956).

Russell, John, U.S. author (b. Davenport, Ia., April 22, 1885—d. Santa Monica, Calif., March 6, 1956).
Russo, Danny, U.S. song writer and orchestra leader (b. Chicago, Ill., Oct. 14, 1885—d. Hollywood, Calif., Sept. 5, 1956).
Ruthven, Walter Patrick Hore-Ruthven, 9TH LORD and 2ND BARON OF, British army officer (b. London, Eng., June 6, 1870—d. Bath, April 16, 1956).
Ryan, James Augustine, U.S. army officer (b. Danbury, Conn., Oct. 22, 1867—d. St. Petersburg, Fla., Jan. 14, 1956).

Ryti, Risto Heikki, Finnish statesman (b. Huittinen, Fin., Nov. 3, 1889—d. Helsinki, Oct. 25, 1956), was president of Finland during World War II, and his own tragedy reflected the tragedy of his country. Educated at Helsinki university he practised law from 1909. After the restoration of his country's independence in 1918 he was elected deputy (1919) and two years later, at 32, became the youngest minister of finance of the world. In 1923 he was appointed governor of the Bank of Finland. When on Nov.

56 OBITUARIES: Connie Mack, U.S. baseball club owner; H. L. Mencken, S. author and critic; A. A. Milne, British author; Lewis A. Pick, U.S. army officer; Elpidio Quirino, Philippine statesman



30, 1939, the U.S.S.R. invaded Finland Ryti formed a coalition government (Dec. 1). On the death of Kyösti Kallio, president of the republic, Ryti was elected in his place on Dec. 19, 1940. Re-elected in 1943 he pledged to Hitler, in June 1944, that Finland would not make a separate peace with the U.S.S.R. On Aug. 1, 1944, however, he was forced to resign. On Nov. 6, 1945, he was arrested, brought to trial and in 1946 condemned to ten years' imprisonment as a war criminal, but was released in 1949 because of illness.

Sabath, Joseph, U.S. jurist (b. Bohemia, March 2, 1870—d. Winnetka, Ill., May 3, 1956).

Saha, Meghnad, Indian nuclear physicist and politician (b. Calcutta, India, 1893—d. New Delhi, Feb. 16, 1956).

Sammons, Wheeler, U.S. publisher (b. Tacoma, Wash., Dec. 1, 1889—d. Chicago, Ill., Feb. 21, 1956), owned and published *Who's Who in America* and similar U.S. regional and specialized biographical reference works. Graduating from Harvard university in 1912, he entered the publishing field in Chicago the next year, becoming president of A. W. Shaw company in 1925. In 1928 he joined the A. N. Marquis company, publishers of *Who's Who*, as part owner, later becoming president and principal owner.

Sanders, Henry Arthur, U.S. educator (b. Livermore, Me., Oct. 22, 1868—d. Ann Arbor, Mich., Nov. 16, 1956).

Sarton, George (Alfred Leon), Belgian-U.S. historian and humanist (b. Ghent, Belg., Aug. 31, 1884—d. Cambridge, Mass., March 22, 1956), was one of the greatest of modern science historians and author of the classic *Introduction to the History of Science* (1927 et seq.). His works ranged through mathematics, philology, the physical and biological sciences, theology, technology, art, politics and humanism. A graduate of the University of Ghent (Belg.), Sarton went to England at the start of World War I and to the United States the next year. There, after several lectureships, he joined the faculty of Harvard university in 1920. He became full professor in 1940 and held this post until his retirement in 1951. Sarton founded and edited *Isis*, a quarterly periodical of science history (1912), and *Osiris*, a companion publication (1936). He was engaged in writing a nine-volume history of science, having completed but two volumes at the time of his death.

Sayre, Daniel Clemens, U.S. engineer and educator (b. Columbus, O., Feb. 1, 1903—d. Princeton, N.J., Oct. 19, 1956).

Schilling, David Carl, U.S. air force officer (b. Leavenworth, Kan., 1919?—d. nr. Mildenhall, Suffolk, Eng., Aug. 14, 1956).

Schmidt, Otto Yulevich, Russian explorer, geographer and mathematician (b. 1892?—d. Moscow, U.S.S.R., Sept. 7, 1956).

Schneider, Walter Arthur, U.S. nuclear physicist (b. East London, S.Af., Jan. 2, 1899—d. New York, N.Y., Nov. 20, 1956).

Schwartz, Jean, U.S. composer (b. Budapest, Hung., Nov. 4, 1878—d. Sherman Oaks, Calif., Nov. 30, 1956).

Scott, Sir (Henry) Harold, British physician (b. Eng., Aug. 3, 1874—d. Baintree, Aug. 6, 1956).

Selbach, Albert Carl ("Kip"), U.S. baseball player (b. Columbus, O., March 24, 1874—d. Columbus, Feb. 17, 1956).

Sell, Frederic Carl, German-U.S. educator (b. Bonn, Ger., Jan. 6, 1892—d. South Hadley, Mass., Aug. 11, 1956).

Seyffert, Leopold, U.S. painter (b. California, Mo., Jan. 6, 1887—d. Bound Brook, N.J., June 13, 1956).

Seymour, Edward Loomis Davenport, U.S. horticulturist (b. Boston, Mass., April 29, 1888—d. Huntington, N.Y., Aug. 3, 1956).

Shatzky, Jacob, U.S. historian and editor (b. Warsaw, Pol., Aug. 16, 1894—d. New York, N.Y., June 13, 1956).

Sherrill, Stephen H., U.S. army officer (b. East Hampton, N.Y., March 13, 1893—d. Washington, D.C., June 28, 1956).

Shinicky, Patrick Henry (SHIN IKHI), South Korean politician (b. 1893?—d. Iri, S. Kor., May 5, 1956).

Shorr, Ephraim, U.S. biologist (b. New Haven, Conn., June 1, 1897—d. New York, N.Y., Jan. 6, 1956).

Short, Hassard (Hubert Edward Hassard-Short), U.S. stage director (b. Edlington, Eng., Oct. 15, 1877—d. Nice, Fr., Oct. 9, 1956).

Shumway, Waldo, U.S. educator and botanist (b. New Brunswick, N.J., May 8, 1891—d. New York, N.Y., March 8, 1956).

Simmons, Al (Aloysius Harry Szymanski), U.S. baseball player (b. Milwaukee, Wis., May 22, 1903—d. Milwaukee, May 26, 1956), was elected to baseball's hall of fame in 1953; his lifetime batting average in the major leagues was .334 in 2,215 games extending over 21 seasons (1924-44). Simmons began professional ball with the old Milwaukee Brewers of the American association. He entered the major leagues with Connie Mack's Philadelphia Athletics in 1924 and remained with that club as a slugging outfielder until 1932, when his contract was sold to the Chicago White Sox. He later played with the Detroit Tigers, Washington Senators, Boston Braves, Cincinnati Reds, and again with Philadelphia. He quit active playing in 1944. Simmons was voted the most valuable player of 1929 in the American league and twice won the league's batting championship, in 1930 with .381 and in 1931 with .390. He batted .329 in four world series and .462 in three All-Star games.

Simon, Sir Francis (Eugene), British scientist (b. Berlin, Ger., July 2, 1893—d. Oxford, Eng., Oct. 31, 1956).

Sinclair, Harry Ford, U.S. oil executive (b. Wheeling, W. Va., July 6, 1876—d. Pasadena, Calif., Nov. 10, 1956), was a principal figure in the Teapot Dome scandals originating during the administration of Pres. Warren G. Harding in 1922. In that year Albert B. Fall, Harding's secretary of the interior, leased the Teapot Dome (Wyo.) oil reserve of the U.S. navy to an oil company controlled by Sinclair. The latter was acquitted on a charge of conspiracy in 1928 but the next year was convicted of contempt of court and of the U.S. senate and served several months in prison. Originally a pharmacist, Sinclair entered the petroleum business in 1901 in Kansas and within a decade became one of the most important independent producers in the United States. In 1916 he organized his own oil production, refining

and marketing company, which later became one of the largest "integrated" petroleum companies in the world—Sinclair Oil corporation. He retired as president of this corporation in 1949. During World War II Sinclair was a member of the Petroleum Industry War council.

Skelton, Sir Reginald William, British naval officer (b. Long Sutton, Eng., June 3, 1872—d. Aldingbourne, Sept. 5, 1956).

Slaughter, N. Carter ("Tod"), British actor (b. Newcastle upon Tyne, Eng., March 19, 1885—d. Derby, Feb. 19, 1956).

Slootnick, Morris Miller, U.S. oil scientist (b. Zelva, U.S.S.R., Dec. 21, 1901—d. Dallas, Tex., May 7, 1956).

Smith, Addison Taylor, U.S. public official (b. nr. Cambridge, O., Sept. 5, 1862—d. Washington, D.C., July 5, 1956).

Smith, Cecil M(ichener), U.S. music critic and author (b. Chicago, Ill., July 12, 1906—d. London, Eng., May 28, 1956).

Smith, Earl Baldwin, U.S. educator (b. Topsham, Me., May 25, 1888—d. Princeton, N.J., March 7, 1956).

Smith, Frederick Cleveland, U.S. public official (b. Shanesville, O., July 29, 1884—d. Marion, O., July 16, 1956).

Soddy, Frederick, British scientist (b. Eastbourne, Sussex, Sept. 2, 1877—d. Brighton, Sept. 22, 1956), was one of the pioneers of research into atomic disintegration; his work on the nature of isotopes also contributed significantly to modern science. He was educated at Eastbourne college, at the University college of Wales and at Merton college, Oxford. His work with Ernest Rutherford (afterward Lord Rutherford) at McGill university and later with William Ramsay in London on radioactive research won him the Nobel prize for chemistry in 1921. After ten years as lecturer in physical chemistry and radioactivity at Glasgow university (Scot.), he was professor of chemistry at Aberdeen, 1914-19, then Lee's professor of chemistry at Oxford from 1919 until his retirement in 1936 as professor emeritus. His publications included *The Interpretation of Radium* (1909, rev., 1920), and *The Interpretation of the Atom* (1932). He had been elected F.R.S. in 1910 and was awarded the Albert medal in 1955.

Söderman, Harry, Swedish criminologist (b. Stockholm, Swed., 1902?—d. Tangier, Mor., March 16, 1956).

Somoza, Anastasio, Nicaraguan president (b. San Marcos, Nic., Feb. 1, 1896—d. Balboa, C.Z., Sept. 29, 1956), ruled Nicaragua as virtual dictator from 1935 until his assassination in 1956. Educated at Nicaragua's Instituto Nacional de Oriente and at the Pierce business school in Philadelphia, Pa., Somoza became war minister (1932) in the cabinet of Pres. Juan B. Sacasa, and after various revolutions seized the reins of government when Sacasa resigned in 1936, becoming the duly elected president of the nation the following year. In 1947 he hand-picked Leonardo Argüello to succeed him, but the two fell out and Somoza executed a successful coup that ousted Argüello on May 25, 1947. He subsequently installed his uncle, Victor M. Román y Reyes, in the presidency. After the latter's death in May 1950 Somoza was again elected provisional president and in 1951 was elected for the full term ending in 1957. His administration was marked by close relations with the U.S., but internally his totalitarian policies earned him many political enemies. He was shot by an assassin Sept. 21, 1956, at León, Nic., but was believed to be recovering when he died eight days later in a U.S. Canal Zone hospital. The Nicaraguan congress on Sept. 29 unanimously elected Somoza's eldest son, Luis, to succeed him.

Spain, Will Cook, U.S. physician (b. Murfreesboro, Tenn., Aug. 10, 1891—d. New York, N.Y., May 12, 1956).

Speyer, Leonora, U.S. poet (b. Washington, D.C., Nov. 7, 1872—d. New York, N.Y., Feb. 10, 1956), won the 1927 Pulitzer poetry prize for her book of verse *Fiddler's Farewell* (1926). Her other works included *The Naked Heel* (1931) and *Slow Wall* (1936). In 1955 she was awarded the Poetry Society of America's gold medal.

Spier, Larry, U.S. music publisher and composer (b. New York, N.Y., April 3, 1901—d. New York, Nov. 10, 1956).

Spyridon (SPYRIDON VLACHOS), archbishop and primate of Athens and all Greece (b. Hili, Turk., 1874—d. Athens, Gr., March 21, 1956).

Stamm, John Samuel, U.S. Evangelical bishop (b. Alida, Kan., March 23, 1878—d. Kansas City, Mo., March 5, 1956).

Stauffer, Edna Pennypacker, U.S. painter and educator (b. Chester county, Pa., 1887—d. Ashfield, Mass., Aug. 27, 1956).

Steed, Henry Wickham, British journalist (b. Long Melford, Suffolk, Oct. 10, 1871—d. Wootton-by-Woodstock, Oxford, Jan. 13, 1956).

Stephenson, Henry, British actor (b. Grenada, B.W.I., April 16, 1874—d. San Francisco, Calif., April 24, 1956).

Stern, Bernhard Joseph, U.S. anthropologist (b. Chicago, Ill., June 18, 1894—d. New York, N.Y., Nov. 22, 1956).

Stern, Kurt Guenter, U.S. biochemist (b. Tilsit, Ger., Sept. 19, 1904—d. London, Eng., Feb. 3, 1956).

Stevens, Leslie Clark, U.S. naval officer (b. Kearney, Neb., Feb. 19, 1895—d. Sanford, Fla., Nov. 30, 1956).

Stewart, Marshall Bowyer, U.S. theologian (b. Galveston, Tex., Sept. 4, 1880—d. Sewanee, Tenn., July 28, 1956).

Stewart, Matthew John, British pathologist (b. Dalmellington, Eng., May 4, 1885—d. Stoke Poges, Nov. 7, 1956).

Storrs, John Bradley, U.S. sculptor (b. Chicago, Ill., 1885—d. Mer, Loiret-Cher, Fr., April 22, 1956).

Stout, William Bushnell, U.S. aviation engineer (b. Quincy, Ill., March 16, 1880—d. Phoenix, Ariz., March 20, 1956), designed the Ford Tri-Motor transport (1925) and several other famous planes, including the first all-metal plane for the U.S. navy in 1922. In 1926 he inaugurated the first all-passenger air route in the United States, between Detroit and Grand Rapids, Mich. He also designed automobiles and railway cars, and in the latter part of his career operated his own engineering research laboratories in Phoenix, Ariz.

Sullivan, Francis Loftus, British actor (b. London, Eng., Jan. 6, 1903—d. New York, N.Y., Nov. 19, 1956).

Illivan, Gael E., U.S. government official (b. Providence, R.I., Nov. 28, 1904—d. New York, N.Y., Oct. 27, 1956).

Leikert, Robert, U.S. auto racing driver (b. Los Angeles, Calif.—d. Salem, Ind., June 17, 1956).

Mayo, Franz, Bolivian author (b. La Paz, Bol., 1879—d. La Paz, July 30, 1956).

Ortkower, Savieli Grigoryevich, Russian chess authority (b. Rostov-on-Don, U.S.S.R., Feb. 9, 1887—d. Paris, Fr., Feb. 6, 1956).

Sum, Art, U.S. musician (b. Toledo, O., Oct. 13, 1910—d. Los Angeles, Calif., Nov. 5, 1956), was generally considered one of the greatest jazz pianists and technicians of his time. As a boy he studied violin and piano, joining a dance orchestra at the age of 16. In the early 1930s he first attracted national attention in a New York city night club for his piano solos, and later he organized his own dance band. Still later, believing that a full band did no justice to his individualistic technique, he organized a jazz trio with a double-bass player and a guitarist.

Taylor, Frank Sherwood, British scientist (b. Bickley, Kent, Nov. 26, 1897—d. London, Jan. 5, 1956).

Wall, Gardner Callahan, U.S. author and artist (b. Eau Claire, Wis., March 6, 1878—d. Rhinebeck, N.Y., July 22, 1956).

Worman, Lewis Madison, U.S. psychologist (b. Johnson county, Ind., Jan. 15, 1877—d. Palo Alto, Calif., Dec. 21, 1956).

Thomas, Benjamin Platt, U.S. historian and author (b. Pemberton, N.J., Feb. 22, 1902—d. Springfield, Mass., Nov. 29, 1956).

Thomas, Frederick William, British orientalist (b. Staffordshire, Eng., March 11, 1867—d. nr. Banbury, May 6, 1956).

Thompson, James Matthew, British historian and theologian (b. Iron Acton, Eng., Sept. 27, 1878—d. Oxford, Oct. 8, 1956).

Turnhill, Claude E. ("Tiny"), U.S. football coach (b. 1893?—d. Berkeley, Calif., June 29, 1956).

Turner, Walter, U.S. neurologist (b. New York, N.Y., Feb. 24, 1874—d. St. Petersburg, Fla., Feb. 12, 1956).

Tinkham, George Holden, U.S. congressman (b. Boston, Mass., Oct. 29, 1870—d. Cramerton, N.C., Aug. 28, 1956), served 14 consecutive terms in the U.S. house of representatives (1915-43) as a Republican for the 10th Massachusetts district, without once conducting a political campaign. An expert big-game hunter, he would usually depart on a hunting expedition or travel abroad instead of electioneering; yet he received large pluralities in a district normally Democratic. A graduate of Harvard (1894) and an attorney, Tinkham was a Boston alderman and a Massachusetts state senator before being elected to congress. In the house he was noted for his unqualified opposition to U.S. intervention in foreign affairs, and to national prohibition and all other forms of restraint on individual freedom. He was believed to be the first American to fire a shot (against Austrian troops near the Italian border) in World War I after the United States declared war on Germany, April 6, 1917.

Tracy, Mathew Adrian, U.S. physician and army officer (b. Council Bluffs, Ia., March 5, 1876—d. Council Bluffs, March 11, 1956).

Trin, George Timothy, U.S. artist (b. Weybridge, Vt., July 26, 1864—d. Tr. Albans, Vt., May 5, 1956).

Tracy, Charles Cutler, U.S. educator (b. East Hardwick, Vt., Dec. 20, 1863—d. Chicago, Ill., Nov. 12, 1956).

Truente, Cosme de la, Cuban statesman (b. Ingenio La Isabel, Cuba, June 7, 1872—d. Havana, Dec. 8, 1956).

Trenchard, Hugh Montague Trenchard, 1st Viscount of Wolfeton, British air force officer (b. Taunton, Somerset, Feb. 3, 1873—d. London, Feb. 10, 1956), joined the Royal Scots fusiliers in 1893 and served as an officer on the Indian frontier and in the South African War, in which he was seriously wounded. In 1903 he was posted to the West African frontier force. He won the D.S.O. and played an important part in pioneering the administration of Southern Nigeria, commanding the Southern Nigerian regiment, 1908-12. On his return to England he became interested in the early experiments in flying, trained as a pilot in the royal flying corps and rose rapidly until in 1914 he commanded the R.F.C. 1st wing in France. In 1915 he became commander of the R.F.C. Quick to perceive the importance of air power in warfare, Trenchard evolved a policy of aggression to maintain air supremacy—the continual emergencies of war helped him in this. On Jan. 1918 he became the first chief of air staff, but disagreed over policy with Lord Rothermere, then secretary of state for air, and resigned in April. He then was appointed leader of the Independent air force, formed with the intention of bombing Germany into submission, but this project was not put into practice as the war ended in November. In 1919 Trenchard was appointed chief of air staff and from then until 1929 he devoted his great abilities and energies to establishing and developing the royal air force. During 1921-25 he was principal air A.D.C. to George V, and in 1927 became first marshal of the R.A.F. On relinquishing the post of chief of air staff in 1930 he embarked on a new career in the police force, and the reorganization he carried out as metropolitan police commissioner (1931-35) perhaps equalled his achievements as "father of the royal air force." In 1936 Trenchard began a third and final career, in business, when he became chairman of the United Africa company within the Unilever group, retaining the post until his retirement in 1953. Trenchard was created a baron in 1930 and a viscount in 1936, and during his long career received numerous other honours.

Trean, John William, British physiologist (b. Bodmin, Cornwall, Eng., July 23, 1887—d. Addiscombe, Oct. 13, 1956).

Treor, John Bond, U.S. lawyer and industrialist (b. Yonkers, N.Y., Nov. 19, 1878—d. New York, N.Y., Feb. 20, 1956).

Treman, Sir Arthur Elijah, British geologist (b. April 26, 1894—d. Ealing, Eng., Jan. 5, 1956).

Trout, Max O'Rell, U.S. lawyer (b. Millersburg, Mo., Jan. 25, 1904—d. Washington, D.C., Feb. 2, 1956).

Trubauer, Frank, U.S. musician (b. Carbondale, Ill., May 30, 1901—d. Kansas City, Mo., June 11, 1956).

Truderos, Emmanuel, Greek financier and wartime premier (b. July 19, 1882, Methymon, Crete—d. Genoa, Feb. 10, 1956).

Tucker, Preston Thomas, U.S. automobile promoter (b. Capac, Mich., Sept. 21, 1903—d. Ypsilanti, Dec. 26, 1956), introduced a radically new type of automobile in 1946-47 but was unable to produce it in quantity. His 150-h.p. "Tucker Torpedo" had its engine in the rear, "tear-drop" design, front fenders that turned with the wheels and many other novel features, but only 40 Tuckers were built, all assembled by hand. His company collapsed in 1949 and he was indicted for fraud but was acquitted in 1950. Prior to World War II Tucker had built racing cars and during the war he produced successful combat cars and gun turrets for the U.S. army. After his company's bankruptcy he returned to Ypsilanti, Mich., to manage a machine-tool plant. He continued, however, his attempts to promote the Tucker car.

Tyson, Carroll Sargent, U.S. artist (b. Philadelphia, Pa., Nov. 23, 1877—d. Philadelphia, March 19, 1956).

Ugaki, Kazushige, Japanese soldier and politician (b. Okayamaken, Jap., June 1868—d. Tokyo, April 30, 1956).

Uhler, Horace Scudder, U.S. physicist and educator (b. Baltimore, Md., Aug. 5, 1872—d. Meriden, Conn., Dec. 6, 1956).

Underwood, Thomas Rust, U.S. editor and public official (b. Hopkinsville, Ky., March 3, 1898—d. Lexington, Ky., June 29, 1956).

Upham, Roy, U.S. gastroenterologist (b. Dartmouth, Mass., March 16, 1879—d. New York, N.Y., Jan. 5, 1956).

Van Kirk, Walter William, U.S. Methodist clergyman and radio commentator (b. Cleveland, O., Nov. 11, 1891—d. Wellesley I., N.Y., July 6, 1956).

Van Leer, Blake Ragsdale, U.S. educator (b. Mangum, Okla., Aug. 16, 1893—d. Atlanta, Ga., Jan. 23, 1956).

Vanoni, Ezio, Italian politician (b. Morbegno, Sondrio, It., Aug. 3, 1903—d. Rome, Feb. 16, 1956).

Varè, Daniele, Italian diplomat and author (b. Rome, It., 1880—d. Rome, Feb. 27, 1956).

Vassilenko, Sergei Nikiforovich, Russian composer (b. Moscow, U.S.S.R., March 30, 1872—d. Moscow, March 11, 1956).

Velimirovich, Nicholai, Serbian Orthodox church bishop (b. Yugoslavia, 1882?—d. South Canaan, Pa., March 18, 1956).

Ventris, Michael George Francis, British scholar and architect (b. Wheat-hampstead, Eng., July 12, 1922—d. near Hatfield, Sept. 6, 1956).

Von Leeb, Wilhelm Joseph Ritter Franz, German field marshal (b. Landsberg, Ger., Sept. 5, 1876—d. Augsburg, April 29, 1956).

Von Tilzer, Albert (ALBERT GUMM), U.S. composer (b. Indianapolis, Ind., March 29, 1878—d. Los Angeles, Calif., Oct. 1, 1956).

Wadsworth, Alfred Powell, British editor (b. Rochdale, Eng., May 26, 1891—d. Manchester, Nov. 4, 1956).

Wagner, Charles L., U.S. impresario (b. Charleston, Ill., Sept. 20, 1878?—d. New York, N.Y., Feb. 25, 1956).

Walker, Walter, U.S. publisher and public official (b. Marion, Ky., April 3, 1883—d. Grand Junction, Colo., Oct. 8, 1956).

Walsh, Edmund Aloysius, U.S. Jesuit educator (b. Boston, Mass., Oct. 10, 1885—d. Washington, D.C., Oct. 31, 1956).

Wanamaker, William H. Jr., U.S. clothing retailer (b. Philadelphia, Pa., July 29, 1870—d. Philadelphia, Oct. 21, 1956).

Wartenberg, Robert, U.S. neurologist and educator (b. Grodno, U.S.S.R., June 19, 1887—d. San Francisco, Calif., Nov. 16, 1956).

Watson, Thomas John, U.S. industrialist (b. Campbell, N.Y., Feb. 17, 1874—d. New York, N.Y., June 19, 1956), was president of International Business Machines corporation and its predecessor company, 1914-49, and its board chairman from 1949 until his death. Often called the greatest salesman in the world, he built the multimillion-dollar corporation from a small company known as the Computing-Tabulating-Recording company, which merged with I.B.M. in 1924. Before 1914 Watson had been with the National Cash Register company for 15 years. There he originated his famous placard motto "THINK," which he later hung by the thousands on the walls of I.B.M. offices and plants in 80 nations. At the time of Watson's death I.B.M., with its electronic computers, tabulating machines and other business equipment products, employed 60,000 persons and had estimated assets of more than \$600,000,000. Watson, a trustee of Columbia university in New York city for 23 years, was noted for his philanthropic activities and large-scale bequests.

Weaver, George Davis (Buck), U.S. baseball player (b. Stowe, Pa., Aug. 18, 1891—d. Chicago, Ill., Jan. 31, 1956).

Webb, Maurice, British politician (b. Lancaster, Eng., Sept. 26, 1904—d. Pinner, Middlesex, June 10, 1956).

Webb-Bowen, Sir Tom Ince, British air force officer (b. Tenby, Eng., Jan. 17, 1879—d. Haverfordwest, Oct. 29, 1956).

Weber, Frederick Theodore, U.S. portrait painter, etcher and sculptor (b. Columbia, S.C., March 9, 1883—d. New York, N.Y., Jan. 1, 1956).

Weidman, Frederick Deforest, U.S. dermatologist (b. Bristol, Conn., Oct. 16, 1881—d. Bailey Island, Me., Aug. 30, 1956).

Welker, William Henry, U.S. biochemist (b. Red Hill, Pa., Aug. 20, 1879—d. Spooner, Wis., July 7, 1956).

Wellings, Augustus Joseph, U.S. naval officer (b. Chelsea, Mass., Feb. 3, 1897—d. Bethesda, Md., Nov. 29, 1956).

Weskamm, Wilhelm, German Roman Catholic prelate (b. Helsen, Waldeck, Ger., March 13, 1891—d. Berlin, Aug. 21, 1956).

Wesson, Charles Macon, U.S. army officer (b. St. Louis, Mo., July 23, 1878—d. Washington, D.C., Nov. 24, 1956).

Weston, Karl Ephraim, U.S. art educator (b. Winchendon, Mass., Oct. 7, 1874—d. Williamstown, Mass., May 4, 1956).

Weyerhaeuser, John Philip, Jr., U.S. timberman (b. Rock Island, Ill., Jan. 18, 1899—d. Tacoma, Wash., Dec. 8, 1956).

Wheeler, Hallie Erminie Rives (MRS. POST WHEELER), U.S. novelist (b. Christian county, Ky., May 2, 1878—d. New York, N.Y., Aug. 16, 1956).

Wheeler, Post, U.S. diplomat and author (b. Owego, N.Y., Aug. 6, 1869—d. Neptune, N.J., Dec. 23, 1956).

Whitby, Sir Lionel Ernest Howard, British bacteriologist (b. 1895—d. London, Eng., Nov. 24, 1956).

Whiteley, Martha Annie, British inventor and editor (b. Nov. 11, 1866—d. London, Eng., May 24, 1956).

Whiteside, Horace Eugene, U.S. educator and law consultant (b. Bell Buckle, Tenn., June 5, 1891—d. Ithaca, N.Y., June 9, 1956).

Whittaker, Sir Edmund Taylor, British mathematician (b. Southport, Oct. 24, 1873—d. Edinburgh, Scot., March 24, 1956), was educated at Manchester grammar school and at Trinity college, Cambridge, where he became a fellow in 1896. He was elected a fellow of the Royal society in 1905. He lectured in mathematics at Cambridge and was appointed in 1906 Royal Astronomer of Ireland, principally a teaching post in Dublin university. From 1912 to 1946 he was professor of mathematics at Edinburgh university. He excelled not only in mathematics but also as a science historian. His prolific mathematical contributions were in mathematical physics as well as in dynamical problems and his work on differential equations and functions had great influence. *A History of the Theories of Ether and Electricity* . . . (1910, revised in 1951-53), showed the philosophic depth behind his mathematical thought. Whittaker was co-author with Albert Einstein and Sir James Jeans respectively of the articles *SPACE-TIME and RELATIVITY* in *Encyclopædia Britannica*. He became a Roman Catholic in 1930 and wrote several works on the relationship between science and natural theology. He was knighted in 1945.

Whittlesey, Derwent Stainthorpe, U.S. geographer (b. Pecatonica, Ill., Nov. 11, 1890—d. Boston, Mass., Nov. 25, 1956), was a pioneer U.S. authority on geopolitics, which he once defined as "the utilization of geography in the service of national governments." Whittlesey was one of the first scholars to point out the great influence of the German geographer Karl Haushofer (1869-1946) and his Institute of Geopolitics (Munich) on Adolf Hitler's plans for German expansion and ultimate world supremacy. Educated at The University of Chicago, where he took his doctorate in 1920, Whittlesey taught geography at that university from 1919 to 1928, when he transferred to Harvard, where he became full professor in 1943. During World War II he was a consultant for the U.S. war, navy and state departments and for the office of strategic services. He was the author of several works on political and economic geography.

Wilcox, James Mark, U.S. congressman (b. Willacoochee, Ga., May 21, 1890—d. White Springs, Fla., Feb. 2, 1956).

Williams, Stanley Thomas, U.S. educator and author (b. Meriden, Conn., Oct. 25, 1888—d. New Haven, Conn., Feb. 4, 1956).

Williams, Wuthe, U.S. foreign correspondent and broadcaster (b. Meadville, Pa., Sept. 18, 1881—d. Jersey City, N.J., July 13, 1956).

Willis, Raymond Eugene, U.S. politician and publisher (b. Waterloo, Ind., Aug. 11, 1875—d. Angola, Ind., March 21, 1956).

Wilson, Frank H., U.S. Negro actor and playwright (b. New York, N.Y., May 4, 1891?—d. New York, N.Y., Feb. 16, 1956), was creator of the title role in the drama *Porgy* in 1927. Other famous roles he played were those of Lem in *Emperor Jones*, Moses in *The Green Pastures* and Abraham McCranie in *In Abraham's Bosom*. Wilson also starred in motion pictures and television. He was the author of several plays, including *Sugar Cane*.

Wilson, George Lloyd, U.S. educator (b. Philadelphia, Pa., July 10, 1896—d. Philadelphia, April 11, 1956).

Wilson, John Henry, Hawaiian politician and engineer (b. Honolulu, T.H., Dec. 15, 1871—d. Honolulu, July 2, 1956).

Wilson, Philip Whitwell, British-U.S. journalist (b. Kendal, Westmoreland, Eng., May 21, 1875—d. New York, N.Y., June 6, 1956).

Winans, James Albert, U.S. educator (b. Sidney Center, N.Y., Feb. 8, 1872—d. Ithaca, N.Y., Nov. 20, 1956).

Winkelman, Nathaniel William, Sr., U.S. neurologist (b. Philadelphia, Pa., Oct. 28, 1891—d. Philadelphia, Feb. 13, 1956).

Wirth, Karl Joseph, German politician (b. Freiburg, Baden, Sept. 6, 1879—d. Freiburg, Jan. 3, 1956). In 1914, as a member of the Centre (Roman Catholic) party, he was elected to the *Reichstag*, in 1919 to the Weimar national assembly and in March 1920, appointed minister of finance. In May 1921 he became chancellor with an avowed policy of the fulfilment of treaty obligations. The decision on the partition of Upper Silesia between Germany and Poland (Oct. 20, 1921) increased the opposition to the policy of fulfilment. Wirth resigned on Oct. 22, 1921, but resumed office four days later. With Walther Rathenau as foreign minister, Wirth represented Germany at the Genoa Economic conference and on that occasion concluded the German-Soviet treaty of friendship at Rapallo (April 16, 1922). Unable to carry out the necessary financial measures to stop the depreciation of the mark, he resigned in Nov. 1922. In 1929-30 he served as minister for the provinces occupied by the Allies. In 1930 he became minister of the interior and retired in Oct. 1931, returning to Freiburg. After Hitler came to power he went to Paris and later to Switzerland. Returning to Germany in 1948 he opposed the policy of rearming the German Federal Republic and its joining the North Atlantic Treaty organization, supporting instead the policy of a reunited but neutral Germany. In Dec. 1955 he was awarded the Stalin peace prize. (See also *Encyclopædia Britannica*.)

Wislocki, George Bernays, U.S. anatomist (b. San Jose, Calif., March 25, 1892—d. Milton, Mass., Oct. 22, 1956).

Witmer, Lightner, U.S. author and psychologist (b. Philadelphia, Pa., June 28, 1867—d. Philadelphia, July 19, 1956).

Wittmack, E. Franklin, U.S. artist (b. New York, N.Y., July 10, 1894—d. New York, April 25, 1956).

Wohlenberg, Walter Jacob, U.S. educator (b. Lincoln, Neb., Feb. 17, 1888—d. New Haven, Conn., Aug. 8, 1956).

Wolf, Irwin Damasius, U.S. merchant (b. Paragould, Ark., July 8, 1894—d. Pittsburgh, Pa., April 18, 1956).

Woll, Matthew, U.S. labour leader (b. Luxembourg, Jan. 25, 1880—d. New York, N.Y., June 1, 1956), was one of the most conservative of 20th-century U.S. union officials and a staunch Republican. Emigrating to the United States with his family in 1891, he attended Lake Forest (Ill.) university, 1901-04, and in 1906 became president of the International Photoengravers' union—a position he kept for 23 years. Woll also rose high in the executive ranks of the American Federation of Labor, and when the latter merged with the Congress of Industrial Organizations in 1955 he was named a vice-president of the combined A.F. of L.-C.I.O. A Catholic and a vehement anti-Communist, Woll served on a number of federal and private philanthropic agencies.

Wood, Philip Worsley ("P.W."), British educator and mathematician (b. Hammersmith, Eng., April 26, 1880—d. Cambridge, April 15, 1956).

Woodruff, John Kellogg, U.S. painter and sculptor (b. Bridgeport, Conn., Sept. 6, 1879—d. Nyack, N.Y., June 14, 1956).

Woolley, Clarence Mott, U.S. manufacturer (b. Detroit, Mich., Sept. 15, 1863—d. Newport Beach, Calif., July 18, 1956).

Woolson, Albert, U.S. civil war veteran (b. Antwerp, N.Y., Feb. 11, 1847—d. Duluth, Minn., Aug. 2, 1956), was the last survivor of the Union army of the American civil war. He joined the northern army Oct. 10, 1864, as a rifleman but saw no active fighting before being mustered out Sept. 7, 1865; most of his service was spent as a drummer boy with the 1st Minnesota heavy artillery regiment in Tennessee. Woolson became the final member of the Grand Army of the Republic in 1953, having become senior vice-commander in chief of the veterans' organization three years earlier. He and five others attended the final encampment of the G.A.R. at Indianapolis, Ind., in 1949.

Wright, Fielding Lewis, U.S. political leader (b. Rolling Fork, Miss., May 16, 1895—d. Jackson, Miss., May 4, 1956), was one of the founders of the States' Rights Democrat ("Dixiecrat") party that revolted from the regular Democratic party in 1948 over the question of civil rights. Wright was the vice-presidential nominee of the short-lived party, which polled 39 electoral and 1,169,021 popular votes in the national election of 1948. Gov. J. Strom Thurmond of South Carolina was the presidential candidate of the Dixiecrats. Wright, a lifelong foe of desegregation for Negroes, was a graduate of the University of Alabama law school and practised law before serving in the Mississippi state senate (1928-32) and state house of representatives (1932-40). He was lieutenant governor of Mississippi from 1944 to 1946 and governor from 1946 to the end of 1952.

Wright, William Kelley, U.S. philosopher (b. Capton, Ill., April 18, 1877—d. Hanover, N.H., March 29, 1956).

Wyckherly, Margaret, U.S. actress (b. London, Eng., Oct. 26, 1881—d. New York, N.Y., June 6, 1956).

Wynn, Harold Edward, British Anglican bishop (b. Buckhurst Hill, Essex, Eng., Jan. 15, 1889—d. Cambridge, Aug. 12, 1956).

Ybarnegaray, Jean, French lawyer (b. Uhart-Cize, Fr., Oct. 16, 1883—d. Paris, April 25, 1956).

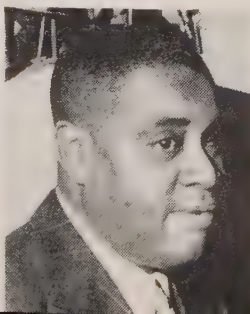
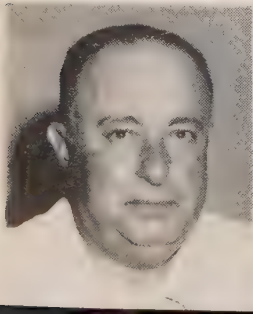
Yerkes, Robert Mearns, U.S. psychobiologist and author (b. Breadysville, Pa., May 26, 1876—d. New Haven, Conn., Feb. 3, 1956).

Young, Ella, Irish poet and educator (b. Dublin, Ire., 1867—d. Oceana, Calif., July 23, 1956).

Young, Victor, U.S. composer of popular songs (b. Chicago, Ill., Aug. 8, 1900—d. Palm Springs, Calif., Nov. 10, 1956), composed and arranged the scores for a number of U.S. motion pictures and wrote such popular hit songs as "Sweet Sue," "Ghost of a Chance" and "Can't We Talk It Over?" Trained as a classical musician at Imperial conservatory at Warsaw, Pol., he made his U.S. debut as a violinist at Chicago in 1921. Later he turned to popular music composition, writing or arranging the scores for *Scaramouche*, *For Whom the Bell Tolls*, *Story of Will Rogers*, *Lady in the Dark*, *Three Coins in the Fountain*, *Johnny Guitar*, *Country Girl* and many other motion pictures.

Zaharias, Mildred ("Babe") Didrikson, U.S. athlete (b. Port Arthur, Tex., June 26, 1914—d. Galveston, Tex., Sept. 27, 1956), was termed by many sports writers and observers the greatest woman athlete of all time. Prior to her appearance in the Olympic games at Los Angeles (Calif.) in 1932—when she won the 80-metre hurdle event and the javelin throw—she had become a top performer in baseball, basketball, swimming, diving and most competitive field sports. Yet her greatest achievements were to come in golf, which she began playing about 1935. During the next 15 years she won every major women's golf championship, including the U.S. national open three times (1948, 1950 and 1954), the national amateur tournament (1946), the world championship tournament four times (1948-51), the British amateur tournament in 1947 (the first U.S. winner of that event) and numerous lesser titles. She became a professional golfer in 1947. First stricken with cancer in 1953, she recovered to win still more major tournaments, including the women's national open in 1954; but she suffered a relapse in 1955. Her autobiography, *This Life I've Led*, was published in 1955.

1956 OBITUARIES: Anastasio Somoza, president of Nicaragua; Art Tatum, U.S. jazz pianist; Thomas J. Watson, U.S. industrialist; Albert Woolson, U.S. soldier; Mildred ("Babe") D. Zaharias, U.S. athlete



Occupational Diseases: see INDUSTRIAL HEALTH.

Oceanography.

Comprehensive views on modern oceanographic knowledge and on the problems to be studied in the future were supplied in 1956 by the publication of four volumes containing contributions from most of the world's oceanographers. One collection was published to honour Henry B. Bigelow, "father of American oceanography," while another—largely biological—honoured Allan Hancock of the University of Southern California, Los Angeles. The third publication contained the papers presented at a convocation held in 1954 to dedicate the Laboratory of Oceanography of the U.S. Office of naval research at Woods Hole, Mass., while the thoughts, plans and hopes for future research were evident in the proceedings of a deep sea symposium held at Washington, D.C. Although scientists from the U.S.S.R. were not represented in these publications, the year provided information that Soviet oceanographers were active, particularly in the Sea of Okhotsk and in the Black sea. Some fine theoretical work was performed by P. S. Lineykin.

Plans for the International Geophysical year (1957-58) included the study of deep currents, multiple ship operations, and observations, ocean polar front surveys and carbon dioxide measurements. The main emphasis of the program would be the study of the rate of movement and transport of the subsurface deepwater masses. To answer many fisheries problems and to prevent the danger of nuclear-waste pollution, it had become more and more important to know the age of deepwater in the ocean. Estimates based on various methods varied from 100 to 1000 years. In the Atlantic ocean, changes were to be measured that had taken place in physical and chemical properties of the water since the surveys of the "Meteor" and other vessels during the period 1925-35. In the Pacific ocean where such previous observations were not available, the same kind of detailed survey could be made, so that it would be possible to repeat the observations in a future geophysical year.

As a basis for planning the International Geophysical year, extensive surveys were made in both the Atlantic and Pacific oceans. The greatest survey of its kind, Operation "Norpac" (North Pacific), took place at the end of 1955. About 20 ships from Japan, the U.S. and Canada took part and published their data during 1956. Another major investigation, Operation "Suapac" (equatorial Pacific), took place in the fall of 1956. Six U.S. and Canadian ships, a large number of Japanese vessels and a ship from French New Caledonia.

Data to test some concepts of sedimentation in geosynclines (narrow troughs of sediment) were obtained by several cruises in the Persian gulf, while the "Atlantis" studied geosynclines along the South American coast, adjacent to the Andes. A new depth of 4,180 fathoms was found in the Bartholomew Sea, 39 mi. off Antofagasta, Chile.

Although each year more and more rugged relief is found on the ocean bottom, there remain large, comparatively smooth ocean basins which are thought to hide their actual relief under a carpet of sediment. In the Pacific basin about four-fifths of the smooth area (4,000,000 sq.mi.) is around groups of existing crowned islands and has the form of aprons. Seismic measurements showed that volcanic rocks are several kilometres thick in the vicinity of all islands studied and bury the pre-existing terrain.

The marked contrast between oceanic and continental structures was reported in the latest of an important series of papers from the Lamont Geological observatory of Columbia university. Exclusive of the water column the oceanic crust is less than one-fifth as thick (7.35 km.) as the continental crust in the western Atlantic basin.

In marine meteorology the emphasis was on hurricane research and the prediction of storm surges. The latter studies were particularly advanced by oceanographers in Germany, the Netherlands and England. Attempts to study 50 years of North Atlantic temperature records to correlate hurricane frequency versus sea-surface temperature were not successful; however, it was evident that the resulting charts could be used to consider other oceanographic problems, including long-range weather forecasting.

In the Caribbean area, a new oceanographic vessel, the R.V. "Crawford," and an oceanographic aircraft studied the birth of a hurricane in attempts to learn under what conditions a depression develops into a hurricane.

During recent years basic research on ocean waves led to pilot studies of ships' motions; results obtained by engineering facilities were expected to lead to radical changes in ship designs and operations. Wave and air temperature observations made from weather ships showed that a belief widely held by many seafarers was true: significantly higher waves are generated in cold air than in warm air (i.e., roughly a 10% increase of the warm air values in height per degree centigrade).

Why the great commercial fish populations change in abundance and location had been a vexing puzzle to all fishermen. Both in Japan and in the U.S. programs were started to determine to what extent shifts in climatic and oceanographic conditions relate to these changes.

Important advances had been made in oceanographic instrumentation during the last decade, but there remained many variables in the sea which could not be measured directly. The direct observation of subsurface currents would be particularly desirable. Although there was no scarcity of designed instruments, few observations existed. Two promising methods were tested at sea: one was a parachute drogue and the other consisted of neutral-buoyancy floats designed to stabilize themselves at a given depth and fitted with means of sending out acoustic signals to indicate their position.

(See also COAST AND GEODETIC SURVEY, U.S.; ELECTRONICS; INTERNATIONAL GEOPHYSICAL YEAR, 1957-58; MARINE BIOLOGY; NATIONAL GEOGRAPHIC SOCIETY.)

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Office of Education, U.S.: see EDUCATION.

Ohio. A north central state of the United States, popularly known as the "Buckeye state," Ohio became a state of the union in 1803, but because there was some question about the formality of the action, the U.S. congress in 1953 jestingly went through the motions of formally admitting the state to the union. Area: 41,222 sq.mi., including 222 sq.mi. of water. Pop. (1950 census): 7,946,627, including 5,578,274 urban and

2,368,353 rural; 6,566,531 white and 1,380,096 nonwhite. As of July 1, 1956, the U.S. bureau of the census estimated the population to be 9,096,000. The principal cities and their 1950 population figures are: Cleveland, 914,808; Cincinnati, 503,998; Columbus, 375,901; Toledo, 303,616; Akron, 274,605; Dayton, 243,872; Youngstown, 163,330; and Canton, 116,912.

History.—Three special sessions of the Ohio general assembly were called in 1956. The first session met on Jan. 16. Its purpose was to implement the \$150,000,000 capital improvement program on which the state embarked when the voters in Nov. 1955 approved a constitutional amendment authorizing a bond issue of that amount. This would provide new facilities for pupils in impoverished school districts, students in the six state universities, the mentally ill and the criminally delinquent. At this session the general assembly passed measures setting up the mechanics of issuing up to \$30,000,000 a year in bonds for this program; appropriated \$37,000,000 for use in 1956, \$15,000,000 of it to go for institutions for the mentally ill and criminally delinquent, \$15,000,000 for state universities and \$7,000,000, which was to come from the state's surplus, for impoverished school districts; and increased the state tax on cigarettes from 2 to 3 cents a pack, earmarking the third cent for bond retirement purposes.

The second special session, which met on June 28, was devoted principally to passing laws to reimburse city and town governments for the \$12,000,000 loss in revenue they suffered when an Ohio supreme court decision invalidated certain taxes against shares and capital of financial institutions.

The third special session convened Nov. 26 to consider Gov. Frank J. Lausche's request for emergency authority to take over striking utility companies. This was prompted by a strike of telephone company employees which had left Portsmouth, O., without telephone service since Oct. 15.

Ohio's new state board of education, the 23 members of which were elected in the Nov. 1955 election, organized in 1956 and Robert A. Manchester was elected president. One of the first steps of the board was to assist hard-pressed school districts. For that purpose it had on hand \$10,000,000, of which \$7,000,000 had been appropriated by the January special session of the general assembly and \$3,000,000 had been voted in the regular legislative session in 1955. The board ordered, at a cost of \$75,000, a report from a research firm to try to determine the state's future school needs. This report was made Oct. 9. It predicted that pupil enrolment in Ohio public schools would increase from 1,575,950 in 1956 to 2,022,590 by 1960, requiring 9,707 additional classrooms in that period. The report estimated the construction cost of these classrooms at \$324,000,000 and predicted that local boards of education could bear all but \$49,500,000 of that amount. In November the board announced the appointment of Harold S. Vincent as superintendent of public instruction in Ohio, effective July 1, 1957.

Republicans swept the state offices in the November general election, but Gov. Lausche (Dem.) defeated Sen. George Bender in the race for the U.S. senate seat. C. William O'Neill of Marietta was elected governor. Other state officers chosen by the voters were: Paul Herbert, lieutenant governor; William Saxbe, attorney general; James A. Rhodes, auditor; Roger W. Tracy, treasurer; and Ted W. Brown, secretary of state. The presidential vote in Ohio was 61.1% Republican, 38.9% Democratic.

Two amendments to the Ohio constitution were passed. One provided for the issuance of bonds up to \$90,000,000 to pay a bonus not to exceed \$400 to each Korean war veteran or certain of his survivors. The other changed from two years to four years the term of office for members of the Ohio senate.

Education.—In 1956 the state had 3,623 public and private elementary schools with an estimated total enrolment of 1,236,291 and a total teaching staff of 38,828; 143 junior high schools with an estimated enrolment

of 102,827 and a teaching staff of 3,751; 1,160 senior high schools with an enrolment of 465,117 and a teaching staff of 21,244. There were 1,200 kindergarten classes. State expenditures on education for 1955-56 approximated \$372,000,000. Employed teachers holding only temporary certificates numbered 3,500.

Social Insurance and Assistance, Public Welfare and Related Programs.—The average number of recipients of general relief per month in the fiscal year ended June 30, 1956, was 80,751 and the total assistance extended was \$29,842,307. The average number per month receiving aid for the aged was 99,773, and they received \$69,791,284; aid to dependent children, 62,404 cases received a total of \$17,936,137; aid to the blind, 3,758 cases received a total of \$2,593,113; aid for the disabled, 8,118 cases received a total of \$4,843,259. Administrative expenditures totalled \$9,816,554. Benefits paid by the Ohio bureau of unemployment compensation in the fiscal year ended June 30, 1956, totalled \$52,570,462 in compensation for 1,857,722 weeks of unemployment.

Ohio's correctional institutions had an average daily population of 10,453 for the fiscal year ended June 30, 1956. The industrial training schools had an average daily population of 1,092 and the juvenile diagnostic centre an average daily population of 89. Hospitals for the mentally ill had an average daily population of 27,521 and state schools for the retarded 7,554. Total cost of operating the correctional institutions for the fiscal year was \$8,617,321; industrial training schools, \$1,869,305; juvenile diagnostic centre \$659,239; hospitals for the mentally ill \$29,205,447; schools for the retarded, \$7,926,085.

Communications.—Ohio had 83,065 mi. of highways in 1956 outside municipalities. Of this total, 15,921 mi. were classified as rural state, 29,139 mi. as county and 38,004 mi. as township. Total state expenditure on highways in the fiscal year ended June 30, 1956, were \$120,446,392.

In 1956 Ohio had 104 airports and 68 landing fields certified by the Ohio Aviation board for commercial operation. There were 188 uncertified landing fields. On Jan. 1, 1956, the state had 8,419 mi. of railroads and 3,316,500 telephones.

Banking and Finance.—There were 396 state and private banks and 226 branches in Ohio with deposits (June 30, 1956) of \$5,177,680,583 and resources of \$5,730,577,928. There were 230 active national banks in the state with deposits (June 30, 1956) of \$4,711,260,000 and resources of \$5,133,558,000.

State-chartered savings and loan institutions numbered 456 with total resources (June 30, 1956) of \$2,619,883,824. There were 135 federal savings and loan associations with total assets (Dec. 31, 1955) of \$1,546,944,195.

State of Ohio budgetary receipts for the 1955-57 biennium were \$736,034,000; budgetary expenditures \$732,100,000. The state debt at the end of 1955 was \$623,200,000.

Manufacturing.—Preliminary statistics in the annual survey of manufactures made by the bureau of census of the U.S. department of commerce indicate that the total value added by manufacture in Ohio in 1954 was \$10,153,718,000 as compared with \$11,192,103,000 in 1953 and \$10,933,105,000 in 1952. Ohio in 1954 had 14,532 industrial establishments which employed 1,270,157 workers who were paid \$5,665,852,000. Average weekly earnings of production workers in the state reached a high of \$86.70 in July 1955.

Agriculture.—Cash receipts from farm marketings, January through July 1956, were \$540,912,000 as compared with \$529,700,000 for the same period of 1955. Livestock and products increased to \$350,596,000 against \$336,640,000 in 1955; crops declined to \$190,315,000 from \$193,060,000

Table I.—Principal Industries of Ohio

	All employees 1954	Salaries and wages 1954 (in 000s)	Value added by manufacture 1954 (in 000s)	Value added by manufacture 1953 (in 000s)
Food and kindred products	82,117	\$ 333,435	\$ 683,535	\$ 556,369
Textile mill products	11,596	42,934	84,842	82,363
Apparel and related products	26,376	77,206	115,470	148,118
Lumber and products (except furniture)	10,032	33,148	51,498	50,181
Furniture and fixtures	21,615	88,862	152,838	154,730
Paper and allied products	35,526	157,946	283,310	268,809
Printing and publishing industries	58,854	264,267	456,809	457,429
Chemicals and allied products	41,596	195,101	557,231	522,043
Petroleum and coal products	12,460	62,016	158,396	186,589
Rubber products	71,168	318,211	472,415	570,117
Leather and leather products	13,004	38,801	60,816	68,698
Stone, clay and glass products	65,149	263,178	480,234	460,204
Primary metal industries	170,886	788,595	1,461,868	1,804,111
Fabricated metal products	123,280	549,530	918,410	1,026,995
Machinery (except electrical)	214,643	1,036,329	1,721,294	2,020,137
Electrical machinery	89,853	386,181	716,129	775,144
Transportation equipment	164,681	800,182	1,400,245	1,534,771
Instruments and related products	9,617	40,067	63,437	...
Miscellaneous manufactures	46,165	185,949	305,598	445,571

Source: U.S. Department of Commerce, 1954 Census of Manufactures, preliminary report.

Table II.—Leading Agricultural Products of Ohio

Crop	Indicated 1956	1955	Average, 1945-54
Corn, bu.	216,530,000	220,955,000	185,752,000
Wheat, bu.	39,286,000	43,384,000	52,243,000
Oats, bu.	47,292,000	63,801,000	44,957,000
Barley, bu.	3,640,000	4,294,000	906,000
Rye, bu.	494,000	656,000	436,000
Hay, tons	4,107,000	4,140,000	3,731,000
Soybeans, bu.	31,224,000	29,228,000	20,808,000
Tobacco, lb.	15,840,000	14,322,000	17,479,000
Sugar beets, short tons	230,000	279,000	196,000
Maple sugar, gal.	152,000	113,000	136,000
Apples, bu.	2,000,000	2,700,000	2,823,000
Peaches, bu.	1,000,000	1,030,000	914,000
Pears, bu.	45,000	80,000	163,000
Grapes, tons	8,500	17,000	12,860
Potatoes, cwt.	3,613,000	3,380,000	3,596,000

Source: U.S. Department of Agriculture.

Table III.—Mineral Production of Ohio

(Short tons, except as noted)

Mineral	1953		1954†	
	Quantity	Value	Quantity	Value
Total		\$302,843,000		\$293,659,000‡
Coal (bbl.)	12,532,000	32,957,000	13,077,000	35,929,000
Asphalt	5,635,000	9,328,000	5,051,000	11,136,000
Clay	34,737,000	131,475,000	32,468,000	117,520,000
Crude oil	11,718,000	163,191,000	8,229,000	126,686,000
Petroleum products*	425,000	82,179,000	359,000	63,778,000
Pig iron	15,025,000	742,882,000	11,160,000	545,901,000
Steel	2,946,000	35,310,000	2,549,000	31,444,000
Natural gas (thousand cu. ft.)	37,542,000	8,334,000	28,824,000	6,111,000
Natural gasoline (gal.)				
Bitumen	28,000	260,000	30,000	357,000
Petroleum (bbl.)	3,610,000	9,710,000	3,880,000	10,710,000
Asphalt	3,040,000	7,485,000	2,749,000	12,359,000
Sand and gravel	24,032,000	27,076,000	25,827,000	27,873,000
Other minerals	25,286,000	39,041,000	32,627,000	47,802,000
		1,867,000	...	2,085,000

*Values for processed materials are not included in the totals.

†Value included with other minerals.

‡Preliminary.

Total has been adjusted to eliminate duplication in the value of clays and stone.

Source: U.S. Bureau of Mines.

1955. Cattle increased to 2,416,000 head (of which 930,000 were milk cows) valued at \$253,680,000 from 2,369,000 head and \$244,007,000 at beginning of 1955. Stock sheep declined 1% to 1,036,000 head; hogs increased 10% to 2,836,000 head and horses declined 10% to 73,000 head. Chickens decreased 3%; turkeys increased 10%.

Mineral Production.—Table III shows the tonnage and value of those minerals produced in Ohio in 1953 and 1954 whose value exceeded \$100,000. In 1954 Ohio was first among the states in output of fire clay and lime, second in coke production and consumption, in pig iron output and in stone, third in peat, fourth in cement shipments and petroleum barrel sales and fifth in output of salt and of sand and gravel. It ranked 14th in value of its mineral output, with 2.03% of the U.S. total in 1954. *ENCYCLOPEDIA BRITANNICA FILMS.*—*Middle States*, 2nd ed. (1955); *Ohio* (1955).

Oil: see PETROLEUM.

Minerals and Fats, Vegetable and Animal: see VEGETABLE OILS AND ANIMAL FATS.

Oklahoma. A west south central state of the United States, admitted as the 46th state on Nov. 16, 1907. The name "Oklahoma" is from the Choctaw and Chickasaw words meaning "red people," and was first applied to the Indian territory in 1866. The popular name "Sooner state" was derived from the term "sooner" used in reference to a person who entered the Indian territory before the date staked a claim sooner than the law stipulated when the first public lands in the Indian territory were opened to white settlement by the act for homesteads, April 22, 1889. Area: 69,919 sq. mi., including nearly 1,000 sq. mi. of water surface (artificial lakes and rivers). Pop.: (1950 census) 2,233,351; (July 1, 1956, provisional est.) 2,237,000. The two largest cities are (1950 census) Oklahoma City, the capital, 243,504; and Tulsa, 182,740. Other cities (1950 pop.) are Muskogee, 37,289; Enid, 36,017; Lawton, 34,757; Norman, 27,006; Shawnee, 22,948; Stillwater, 22,338; Ponca City, 20,180; Bartlesville, 19,228; Okmulgee, 18,317; Ardmore, 17,890; McAlester, 17,878; Ada, 15,995; Chickasha, 15,842.

History.—Oklahoma's 1956 expansion program to balance the state's agricultural economy with a variety of industries made a record in history: 51 new manufacturing plants over the state at a cost of \$6,700,000; the expansion of established plants at a cost of \$200,000,000; and two installations totalling \$56,000,000 (government contract), one a plant for production of powder and rocket-propelled missiles (at Pryor) and the other a navy chemical plant (at Muskogee). Millions of visitors numbered at all-time high in 1956 at recreational facilities and areas in Oklahoma: the recently established "Indian City" (a large acreage with primitive type dwellings of the American Indian) and the annual (Aug.) American Indian exposition, both at Anadarko; the National Aircraft show, only one of its kind backed by the U.S. defense department (army, navy, air force and marines), held for five days in Oklahoma City; and other historic institutions and scenic wonders over the state, including 15 state parks and 100 lakes.

Official returns from the state election board on the Nov. 6, 1956, elections showed that Pres. Dwight D. Eisenhower won the Oklahoma electoral votes by a slightly greater majority than in 1952. Sen. Mike Monroney, Democrat, was re-elected to a six-year term in the U.S. senate. The U.S. house of representatives retained the same membership from Oklahoma, one Republican and five Democrats being elected (five holdovers) in 1956. The initiative petition for redistricting the congressional districts in the state, submitted by the Republicans, won by a plurality of votes but lost in the elections for lack of the ratio and percentage of votes as required by state law. Traditional Democratic control of the state offices was maintained in those which were up for election in 1956: corporation commissioner, one judge of the criminal court of appeals and four justices of the state supreme court.

The chief state officers during 1956, all Democrats, elected on Nov. 2, 1954, were Raymond Gary, governor; Cowboy Pink Williams, lieutenant governor; Andy Anderson, secretary of state; A. S. J. Shaw, state auditor; Mac Q. Williamson, attorney general; John D. Conner, state treasurer; Oliver Hodge, superintendent of public instruction.

Education.—The total enrolment in Oklahoma public schools for the term 1955-56 was 527,196 (elementary and high schools) with 20,512 teaching personnel. The total cost for maintaining the elementary and high schools was tentatively given as \$104,000,000 for current expenses. The public schools maintained 129 special education classes with 6,023 children enrolled, of which number 521 were home bound. State institutions of higher learning included the University of Oklahoma and the Oklahoma Agricultural and Mechanical college, both graduate schools, Oklahoma College for Women (Chickasha), Panhandle Agricultural and Mechanical college (Goodwell), Langston university (Langston), and six colleges for teacher training (Ada, Alva, Durant, Edmond, Tahlequah, Weatherford), all state-owned senior colleges. There were 16 two-year junior colleges, of which 7 were state-owned (including the Oklahoma Military academy, Claremore), 3 were independent with church affiliations and 6 were municipal. There were also 6 independent senior colleges with church affiliations.

Social Insurance and Assistance, Public Welfare and Related Programs.—On Aug. 31, 1956, the Oklahoma department of public welfare reported 95,078 old-age assistance cases receiving an average of \$64.34 per case (a total of \$6,116,994); 15,848 dependent children cases (representing 56,045 persons), each case receiving an average of \$83.23 (a total of \$1,319,982); 1,967 blind cases receiving an average of \$78.48 per case (a total of \$154,370); 6,747 cases of disabled, each case receiving an average of \$58.93 (a total of \$397,629). State supported institutions included two tuberculosis sanatoria, one general hospital, four mental hospitals, two schools for mental defectives, two schools for deaf and blind, one reformatory and one penitentiary.

Communications.—The summary of disbursements by the state highway department for construction and maintenance from Jan. 1, 1956, to Sept. 1, 1956, was \$33,794,550.04. The highway department was responsible for 10,636 mi. of highway system in the state as of Jan. 1, 1956. The total public open roads in Oklahoma as of Jan. 1, 1956, was approximately 93,557 mi. Railroad and electric mileage approximated 6,000 mi., not including sidings. There were 15 cities served by five major air lines in Oklahoma.

Banking and Finance.—The state budget office reported state expenditures and payments on bonded debt at \$340,728,805.68, for the fiscal year ending June 30, 1956. The bonded state debt was \$2,561,832.21. State receipts for the fiscal year 1955-56 were \$347,433,767.27. The 25th state legislature appropriated \$230,902,174.98 for the biennium July 1, 1955, to June 30, 1957.

The Oklahoma bank commissioner reported 198 national banks in the state with a total deposit of \$1,714,000,000 on June 30, 1956, and 188 state banks with a total deposit of \$401,263,000. The 29 state savings and loan associations chartered by the state in Oklahoma reported total resources and liabilities of \$118,660,000 as of June 30, 1956.

Agriculture and Livestock.—Oklahoma farmers and ranchers were confronted with a critical situation as a result of the continued drought to the middle of Oct. 1956. Production and supplies of hay and most feed grain crops had been reduced to low levels, and feed on pastures was short, farmers and ranchers already having to market or move large numbers of livestock. Rains the middle of October were too late for fall crop production over most of the state.

Table I.—Principal Crops of Oklahoma

Crop	Indicated		Average, 1945-54
	1956	1955	
Wheat, bu.	64,272,000	24,160,000	77,872,000
Corn, bu.	4,452,000	8,112,000	17,824,000
Oats, bu.	12,506,000	11,968,000	14,433,000
Grain sorghums, bu.	6,517,000	14,404,000	9,164,000
Soybeans for beans, bu.	204,000	460,000	354,000
All hay, tons	1,598,000	2,068,000	1,775,000
Peanuts, lb.	46,125,000	128,640,000	106,218,000
Pecans, lb.	10,000,000	33,000,000	19,210,000
Broomcorn, tons	7,400	17,100	11,630
Cotton, bales	275,000	463,000	356,000
Potatoes, Irish, bu.	261,000	298,000	330,000*
Potatoes, sweet, bu.	105,000	160,000	136,000*

*Average, 1949-54.

Source: U.S. Department of Agriculture.

The state soil conservation board reported 86 soil conservation districts in Oklahoma in 1956, with a total of 69,562 farmers operating 19,133,807 ac. under the conservation plan.

Manufacturing.—The Oklahoma Employment Security commission reported that the monthly average nonfarm employment in Oklahoma for the first six months of 1956 amounted to 561,700; manufacturing employment for the same period averaged 90,500, these figures including employees of government, small firms and certain nonprofit institutions not covered by the Oklahoma Employment Security act. Average covered employment in the state for the calendar year 1955 was 327,000. Wages paid to these workers during the year amounted to \$1,250,000,000. There was an annual average of 84,100 manufacturing workers covered by the law during 1955, and they received \$352,000,000 in wages. (M. H. W.)

Table II.—Principal Industries of Oklahoma

	All employees 1954	Salaries and wages 1954 (in 000s)	Value added by manu- facture 1954 (in 000s)	Value added by manu- facture 1953 (in 000s)
Food and kindred products	15,655	\$52,014	\$98,676	\$91,285
Printing and publishing industries	5,732	21,209	39,968	*
Petroleum and coal products	7,226	32,655	99,718	*
Stone, clay and glass products	5,847	21,589	48,213	48,873
Primary metal industries	3,810	15,350	25,497	*
Fabricated metal products	6,731	27,844	51,424	41,744
Machinery (except electrical)	10,488	44,047	72,635	66,071
Transportation equipment	10,884	50,168	65,783	73,180

*Withheld because the estimate did not meet publication standards, either on the basis of the associated standard error of estimate or on the basis of a consistency review.

Source: U.S. Department of Commerce, 1954 Census of Manufactures, preliminary report.

Table III.—Mineral Production of Oklahoma

(In short tons except as noted)

Mineral	1953 Quantity	1953 Value	1954* Quantity	1954* Value
Total		\$678,913,000		\$650,153,000†
Clays	578,000	637,000	452,000	1,283,000
Coal	2,168,000	13,227,000	1,915,000	11,265,000
Lead	9,000	2,438,000	14,000	3,892,000
Natural gas (000 cu. ft.)	599,955,000	41,397,000	616,355,000	43,145,000
Natural gasoline (000 gal.)	433,650	28,066,000	479,000	24,332,000
Petroleum (bbl.)	202,570,000	546,940,000	185,851,000	518,520,000
Petroleum gases (000 gal.)	414,036	14,886,000	454,000	13,506,000
Sand and gravel	5,011,000	4,259,000	5,424,000	4,265,000
Stone	8,490,000	7,931,000	9,239,000	9,147,000
Zinc	33,000	7,685,000	43,000	9,325,000
Other minerals . . . . .	...	11,447,000	...	12,532,000

*Preliminary.

†Total has been adjusted to eliminate duplication in the value of clays and stone.

Source: U.S. Bureau of Mines.

Mineral Production.—Table III shows the tonnage and value of those mineral commodities produced in Oklahoma in 1953 and 1954 whose value exceeded \$100,000. In 1954 the state was third among the states in output of natural gas and fourth in crude petroleum and zinc output. It ranked fifth in the value of its mineral output, with 4.66% of the U.S. total.

ENCYCLOPÆDIA BRITANNICA FILMS.—*Southwestern States*, 2nd ed. (1954).

Old-Age Insurance: see SOCIAL SECURITY.

Old-Age Pensions: see SOCIAL SECURITY. See also under various states.

Olives: see FRUIT.

Olympic Games. Stars from 67 nations competed in the games of the XVIth Olympiad held at Melbourne, Austr., from Nov. 22 through Dec. 8, 1956, and attracted a record attendance of more than 2,000,000 spectators. Participating athletes established 11 new world records and 36 new Olympic standards. A record field of 75 countries that had entered was reduced because of the outbreak of fighting in Egypt and the armed repression of freedom in Hungary by the U.S.S.R. Switzerland, the Netherlands, Spain, Iraq, Lebanon and Communist China all withdrew in protest of the warfare and Egypt did not enter. Despite the world tension, the competitors in general got along in friendly fashion. A number of European athletes did not return to their homelands after the Olympics, but sought political refuge in Australia and the United States.

The United States dominated the track and field events, which comprise the main competition of the games, winning 16 gold medals. Australian stars scored heavily in swimming and in the women's track and field tests. Although there is no over-all team championship at stake in the Olympic games, the Soviet Union, with a preponderance of strength in gymnastics and the Graeco-Roman type of wrestling, led in the unofficial scoring.

The games were proclaimed open on Nov. 22 by the duke of

Table I.—Team Standings, Summer Games, 1956

(Unofficial scoring of nations, based on ten points for first place, five for second, four for third, three for fourth, two for fifth and one for sixth)

Country	Points	Country	Points
U.S.S.R.	722	Korea	22
United States	593	Yugoslavia	22
Australia	278½	Norway	21
Germany	223	Argentina	18½
Hungary	220½	Chile	17
Italy	185	Mexico	17
Britain	180½	Brazil	12
Sweden	164	Austria	12
Japan	139	Belgium	11
France	120½	India	10
Romania	108	Trinidad	7
Finland	98½	Uruguay	6
Poland	73½	Switzerland	5
Czechoslovakia	71½	Iceland	5
Turkey	61	Pakistan	5
Canada	52	Greece	4
Bulgaria	48	Bahamas	4
Denmark	34½	Portugal	3
Ireland	29	Nigeria	2
New Zealand	28½	Malaya	1
South Africa	26	Spain	1
	24	Cuba	1

Edinburgh. A crowd of 100,000 jammed the Olympic stadium for the colourful inaugural ceremonies when the Olympic flame, kindled by the rays of the sun on Mount Olympus in Greece, was carried into the arena. The flame burned brightly until Dec. 8 when the contests were officially closed by Avery Brundage of Chicago, Ill., president of the International Olympic committee.

Basketball.—Maintaining its record of never having lost an Olympic tournament game, the United States won the gold medals in the court competition. An 89-55 victory over the Soviet Union in the final clinched honours for the Americans. Bill Russell, who accounted for 13 points, and Bo Jeannerard, with 16 tallies, starred for the U.S. Uruguay took third-place medals by conquering France, 71-62.

Boxing.—Peter Rademacher, a hard puncher from Grandview, Wash., and an army man, captured the heavyweight crown with a technical one-round knockout of Lev Moukhine of the U.S.S.R. James Boyd of Rocky Mount, N.C., also with the army at Fort Benning, Ga., won the light-heavyweight gold medal for the U.S. with a unanimous decision over Gheorghe Negrea of Rumania. Laszlo Papp of Hungary, who won in the light-middleweight class, became the first man to win three Olympic gold medals in boxing, having triumphed at London in 1948 and at Helsinki in 1952.

Equestrian Events.—Because of Australia's quarantine on horse importations the site of the equestrian competition was transferred to Stockholm. King Gustav Adolf opened the contests in Stockholm stadium on June 10 and the events ran through June 17. Petrus Kastenman of the host nation finished first in the trying three-day individual tests. Kastenman, a cavalry lieutenant, won with 66.53 points. The British team of Frank Weldon, Lawrence Rook and Albert (Bertie) Hill also was victor. Maj. Henri St. Cyr, a winner in 1952, again took the individual prize in dressage and rode with G. Persson and G. Boltenstern to gain team laurels for Sweden. German riders led by Hans Gunther Winkler won both the individual and team prizes in the Grand Prix jumping.

Gymnastics.—Soviet athletes added 11 gold medals to their collection with a great display of prowess in gymnastics. In the men's competition, Takashi Ono of Japan triumphed on the horizontal bar and Helmut Bantz of Germany tied with Valentine Mouratov, U.S.S.R., on the long horse to break the Soviet Union's monopoly. Russian and Hungarian stars shared the gold medals in the women's division, Agnes Keleti of Hungary and Larisa Latynina of the U.S.S.R. being outstanding.

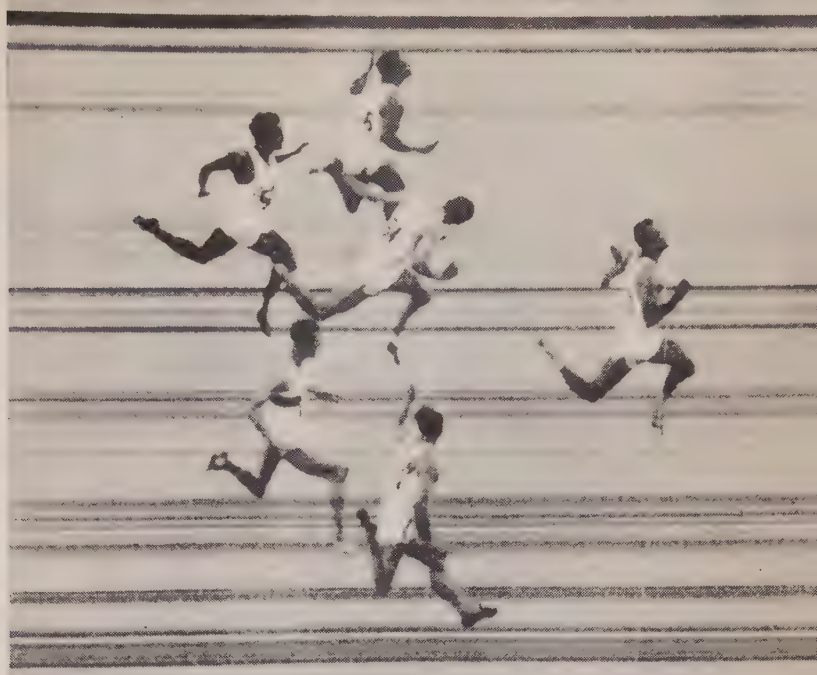
Rowing.—Yale university's eight that had lost in the opening round made the greatest comeback in the history of Olympic rowing to triumph in the final. Given a second chance by the *repêchage* system used in the games, the Yale sweep-swingers became the first ever to win gold medals after losing in the preliminary heats. A crowd of 40,000 along the banks of the 2,000-m. course on Lake Wendouree at Ballarat saw the Elis defeat the Canadian and Australian crews to which they had lost earlier. Yale's thrilling feat capped a day of unprecedented Olympic rowing successes for the United States, which took two other gold, two silver and one bronze medal. Jack Kelly, Jr., of Philadelphia, Pa., making his last Olympic effort in singles sculling, had to be content with third place behind Vyacheslav Ivanov, European champion from the Soviet Union, and Stuart MacKenzie of Australia. Art Ayrault, Conn Findlay and Kurt Seiffert won the pairs with coxswain for the United States, and the U.S. team of James Fifer and Duvall Hecht won the pairs without coxswain.

Swimming.—The close competition between Australian and U.S. stars in both men's and women's events proved a feature of the games and kept the swimming stadium rocking with cheers and applause. Mermen established two new world records and five other Olympic standards while the naiads set one universal mark and four others for the games. The host country's swimmers captured the major share of the gold medals although the U.S. took honours in three of the four diving events. Mrs. Pat Keller McCormick of Lakewood, Calif., won both the women's springboard and platform diving championships to repeat the feat she had accomplished in 1952. Bob Clotworthy of Mountaine, N.J., took the men's springboard contest. George Breen of Buffalo, N.Y., had the misfortune of losing in the 1,500-m. free-style final after setting a world record of 17 min. 52.9 sec. in a qualifying trial. The listed mark was 18 min. 19 sec. Murray Rose, Australia's ace, defeated Breen in the final in 17 min. 58.9 sec. Rose was a triple gold medal winner, taking the 400-m. free style in 4 min. 27.3 sec. as against the games' record of 4 min. 30.7 sec., and with Kevin O'Halloran, John Devitt and Jon Henricks he swam to a world record of 8 min. 23.6 sec. in the 800-m. relay. The mark in the books was 8 min. 29.4 sec. The other universal standard came in the women's 400-m. relay when the Australian



Above: C. F. Darling (left), U.S., and I. G. Mirtchev, Bulgaria, struggling for possession of basketball in a semi-final game. U.S. won, 85-44

XVTH OLYMPIAD MELBOURNE, AUSTRALIA 1956



Above: Photo finish of 100-m. dash, Bobby Morrow, U.S., winning

Below, left: Vladimir Kuts, U.S.S.R., winning 5,000-m. run

Below, centre: Tamara Tychkevitch, U.S.S.R., in the finals of the women's shot-put. She won gold medal and set a new Olympic record

Below, right: Milt Campbell (right), U.S., completing the 1,500-m. race to win the decathlon. Running against Campbell is Ian Bruce, Australia



Above: The Rev. Bob Richards, U.S., clearing the bar at 4.56 m. to win gold medal in the pole vault



Below: Wrestlers D. A. Hodge (right), U.S., and G. H. Farquhar, Great Britain, in a middleweight bout, won by Hodge



quartet of Dawn Fraser, Faith Leech, Sandra Morgan and Lorraine Crapp won in 4 min. 17.1 sec. to better the listed time of 4 min. 24.4 sec. One of the closest races of the Olympics came in the women's 100-m. backstroke final when Judy Grinham of Great Britain defeated Carin Cone of Ridge-wood, N.J. Both were clocked in the new Olympic time of 1 min. 12.9 sec., but the judges ruled that Miss Grinham was victor by an inch. The listed Olympic mark for the event was 1 min. 13.8 sec. although that time had been cut to 1 min. 13.0 sec. by Britain's Margaret Edwards in a trial heat. Miss Edwards placed third in the final. Shelley Mann, Nancy Jane Ramey and Mary Jane Sears swept the first three places for the United States in the 100-m. butterfly race.

Track and Field.—Four world records and 21 other Olympic marks were shattered in the greatest track and field display in the history of the games. U.S. stars won 16 gold medals and a lion's share of the place awards although Vladimir Kuts of the U.S.S.R. was hailed as the top individual performer because of his triumphs in the 5,000- and 10,000-m. events in which he set up new Olympic times. He won the 5,000 m. in 13 min. 39.6 sec. and the 10,000 m. in 28 min. 45.6 sec. The former standards were 14 min. 6.6 sec. and 29 min. 17 sec., both set by Emil Zatopek, Czechoslovakian. Bobby Morrow of San Benito, Tex., became the first man to take both sprints since the feats of Jesse Owens in the 1936 games at Berlin. Morrow captured the 100 m. in 10.5 sec., set a games' mark of 20.6 sec. in the 200 m. and helped the 400-m. relay team win in the world record time of 39.5 sec. The listed record for the 200-m. dash was 20.7 sec. The quartet of Walter Baker, Lea King, Ira Murchison and Morrow lowered the listed universal standard of 39.8 sec. for the 400-m. relay, which had been set by a U.S. team fired by Jesse Owens at Berlin in 1936.

In winning the javelin throw, Egil Danielsen of Norway made a toss of 281 ft. 2½ in. to surpass the world's listed standard of 268 ft. 2½ in. Mildred McDaniel of Atlanta, Ga., leapt 5 ft. 9¼ in. to win the high jump. The highest any woman ever had jumped before was 5 ft. 7¾ in. The Australian 400-m. relay team of Shirley Strickland de la Hunty, Norma Croker, Fleur Mellor and Betty Cuthbert lowered the world clocking of 45.6 sec. to 44.5 sec. Bob Richards retained his Olympic title in the pole vault, winning at 14 ft. 11½ in., which was ¼ in. higher than the record for the games that he set in 1952. United States entries made a sweep of the hurdles gold medals as Glenn Davis of Clinton, O., won the 400-m. test in 50.1 sec. and Lee Calhoun of Gary, Ind., took the 110-m. high event in 13.5 sec. Listed Olympic marks for the events were 50.8 sec. and 13.7 sec. Ron Delany won Ireland's first Olympic gold medal since 1932, the Villanova university (Villanova, Pa.) ace taking the 1,500-m. run in 3 min. 41.2 sec., the listed Olympic standard for the "metric mile" being 3 min. 45.2 sec.

France, which had not won a track or field event since the 1928 games, gained a first when Alain Mimoun finished out in front in the tortuous marathon. The defending champion, Emil Zatopek, placed fifth. Americans finished one-two in the grueling ten-event decathlon. Milton Campbell of Plainfield, N.J., amassed 7,937 points for a new Olympic record to defeat Rafer Johnson of Kingsburg, Calif., who tallied 7,587 points. The former high score for the games was 7,887 set by Bob Mathias of the U.S. in 1952.

Betty Cuthbert helped Australia score heavily in the women's division. In addition to helping set a new world relay record, she won the 100-m. dash in 11.5 sec., and the 200-m. sprint in 23.4 sec. to tie the games and world standards.

The 1960 Olympic summer games were scheduled to be held at Rome, It. **Winter Games.**—Athletes from the Soviet Union, competing in winter Olympic events for the first time, starred in the seventh competition held at Cortina d'Ampezzo, It., Jan. 26-Feb. 5. The Soviet squad led in the most medals won with seven gold, three silver and five bronze, and scored 121 points in the unofficial point standing to pace a field of 32 nations. Austria gained 11 prizes, including 4 for first places. Finland, Sweden, Switzerland and the United States followed. The United States scored only two triumphs, both in figure skating. Hayes Alan Jenkins of Colorado Springs, Colo., led a sweep of medals in the men's division when he amassed 166.4 points to defeat Ronald Robertson of Long Beach, Calif., and his younger brother, David Jenkins. Tenley Albright of Newton Center, Mass., defeated Carol Heiss of Ozone Park, N.Y., for the women's skating laurels, but only after the closest competition from the little New Yorker. Miss Albright was credited with 169.6 points, Miss Heiss with 168.1. Ingrid Wendt of Austria was third. Individual star of the games was Austria's Anton (Toni) Sailer, who registered the only triple of the meeting when he captured the special slalom, giant slalom and downhill race. Sailer won additional honours as the world Alpine champion of the year inasmuch as the Olympic victors gained International Ski federation recognition as the universal champions for the 1956 season.

Two world records and four Olympic records were shattered in the speed skating as the Soviet Union team registered victories in three of the four events. Yevgeni Grishin won the 500-m. event in 40.2 sec. and Grishin and

Table II.—Team Standings, Winter Games, 1956

(Unofficial scoring of nations, based on ten points for first place, five for second, four or third, three for fourth, two for fifth and one for sixth)

U.S.S.R.	121	Canada	16
Austria	78½	France	10
Finland	66	Netherlands	7
Sweden	62	Poland	6
Switzerland	55½	Japan	5
United States	54½	Czechoslovakia	5
Norway	47	Hungary	4
Italy	31½	Great Britain	4
Germany	24	Spain	3

Yuri Mikhailov tied for first in the 1,500 m. in 2 min. 8.6 sec. for Olympic and universal marks. Boris Shilkov, U.S.S.R., bettered a games' mark by winning the 5,000-m. event in 7 min. 48.7 sec. Sigge Ericsson, Swedish ace, broke the Soviet monopoly on the speed skating prizes when he carried off the honours in the 10,000-m. grind. Ericsson established a new Olympic standard of 16 min. 35.9 sec.

The eighth winter Olympics were scheduled for Squaw Valley, Calif., in 1960.

Basketball

Team—United States.

Boxing

Flyweight—Terence Spinks, Great Britain.
Bantamweight—Wolfgang Behrendt, Germany.
Featherweight—Vladimir Safranov, U.S.S.R.
Lightweight—Richard McTaggart, Great Britain.
Light welterweight—Vladimir Enguiban, U.S.S.R.
Welterweight—Nicolae Linca, Rumania.
Light middleweight—Laszlo Papp, Hungary.
Middleweight—Guenadii Chatkov, U.S.S.R.
Light heavyweight—James Boyd, Rocky Mount, N.C.
Heavyweight—Peter Rademacher, Grandview, Wash.

Canoeing

1,000-m. Canadian singles—Leon Rottman, Rumania, 5 min. 5.3 sec.
1,000-m. kayak singles—Gert Fredriksson, Sweden, 4 min. 12.8 sec.
1,000-m. Canadian pairs—Alexe Dumitru and Simion Ismailciuc, Rumania, 4 min. 47.4 sec.
1,000-m. kayak pairs—Michel Scheuer and Meinrad Miltenberger, Germany, 3 min. 49.6 sec.
10,000-m. Canadian singles—Leon Rottman, Rumania, 56 min. 41 sec.
10,000-m. Canadian pairs—Pavel Kharine and Graisan Botev, U.S.S.R., 52 min. 2.4 sec.
10,000-m. kayak singles—Gert Fredriksson, Sweden, 47 min. 43.4 sec.
10,000-m. kayak pairs—Janos Uranyi and Laszlo Fabian, Hungary, 43 min. 37 sec.
500-m. women's kayak singles—Elisaveta Dementieva, U.S.S.R., 2 min. 18.9 sec.

Cycling

1,000-m. sprint—Michel Rousseau, France.
*1,000-m. time trial—Leandro Faggin, Italy, 1 min. 9.8 sec.
2,000-m. tandem—Australia (Ian Browne and Tony Marchanti).
4,000-m. team pursuit—Italy, 4 min. 37.4 sec.
Individual road race (116.65 mi.)—Ercolo Baldini, Italy, 5 hr. 21 min. 17 sec.
Team road race—France, 22 points.

Equestrian

(At Stockholm, Sweden)

Three-day, individual—Lieut. Petrus Kastenman, Sweden.
Three-day, team—Great Britain (Lieut. Col. Frank Weldon, Bertie Hill, Lawrence Rook).
Dressage Grand Prix, individual—Mai. Henri St. Cyr, Sweden.
Dressage Grand Prix, team—Sweden (St. Cyr, G. Persson, G. Boltenstern).
Jumping Grand Prix, individual—Hans Gunther Winkler, Germany.
Jumping Grand Prix, team—Germany (Winkler, A. Luetke-Westhues, Fritz Thiedemann).

Fencing

Men's team foil—Italy.
Men's team épée—Italy.
Men's individual foil—Christian D'Oriola, France.
Men's individual épée—Carlo Pavesti, Italy.
Men's team sabre—Hungary.
Women's foil—Gillian Sheen, Great Britain.
Men's individual sabre—Rudolf Karpoti, Hungary.

Field Hockey

Team—India.

Gymnastics, Men

Pommel horse—Boris Chakhline, U.S.S.R., 19.25 points.
Parallel bars—Victor Tchoukarine, U.S.S.R., 19.2 points.
Free standing exercises—Valentine Mouratov, U.S.S.R., 19.2 points.
Rings—Albert Azarian, U.S.S.R., 19.35 points.
Horizontal bar—Takashi Ono, Japan, 19.6 points.
Combined exercises—Victor Tchoukarine, U.S.S.R., 114.25 points.
Long horse—Helmuth Bantz, Germany, and Valentine Mouratov, U.S.S.R., tied for first, 18.85 points.
Team combined exercises—U.S.S.R., 568.25 points.

Gymnastics, Women

Balance beam exercises—Agnes Keleti, Hungary, 18.800 points.
Combined exercises—Larisa Latynina, U.S.S.R., 74.931 points.
Free standing exercises—Agnes Keleti, Hungary, and Larisa Latynina, U.S.S.R., tied for first, 18.732 points.
Side horse vaulting—Larisa Latynina, U.S.S.R., 18.833 points.
Parallel bars—Agnes Keleti, Hungary, 18.966 points.
Team exercises—Hungary, 75.2 points.
Team combined exercises—U.S.S.R., 444.80 points.

Modern Pentathlon

Individual—Lars Hall, Sweden, 4,833 points.
Team—U.S.S.R., 13,690.5 points.

Rowing

Eights—United States, Yale (Donald Beer, Thomas Charlton, John Cooke, Caldwell Esselstyn, Charles Grimes, Richard Wailes, David Wight, Robert Morey, stroke, William Becklean, coxswain), 6 min. 35.2 sec.
Fours with coxswain—Italy (Angelo Vanzin, Romano Sghez, Alberto Winkler, Franco Trincavelli, Ivo Stefanoli), 7 min. 19.4 sec.
Fours without coxswain—Canada (Archibald McKinnon, Lorne Loomer, Ignace d'Hondt, Donald Arnold), 7 min. 8.8 sec.
Pairs with coxswain—United States (Art Ayrault, Conn Findlay and Kurt Seiffert), 8 min. 26.1 sec.
Pairs without coxswain—United States (James Fifer, Duval Hecht), 7 min. 55.4 sec.
Double sculls—U.S.S.R. (Alexandre Berkoutov, Iuri Tiukalov), 7 min. 24 sec.
Single sculls—U.S.S.R., Vyacheslav Ivanov, 8 min. 2.5 sec.

Shooting

Free pistol—Pentti Limnosvuo, Finland, 556x600.
Clay pigeon—Galliano Rossini, Italy, 195x200.
*Free rifle (300 m.)—Vassili Borissov, U.S.S.R., 1,138 points.
Running deer—Vitalii Romanenko, U.S.S.R., 441x500.
Small-bore rifle (prone, kneeling, standing)—Anatoli Bogdanov, U.S.S.R., 1,172 points.
*Rapid silhouette pistol—Stevan Petrescu, Rumania, 587x600.
†Small-bore rifle—Gerald Ouellette, Canada, 600x600.

Soccer

Team—U.S.S.R.

*Olympic games record. †Olympic and world record. ‡Ties world record.

Swimming, Men

- *100-m. free style—Jon Henricks, Australia, 55.4 sec.
- *100-m. backstroke—David Thiele, Australia, 1 min. 2.2 sec.
- *200-m. breast stroke—Masura Furukawa, Japan, 2 min. 34.7 sec.
- *400-m. free style—Murray Rose, Australia, 4 min. 27.3 sec.
- †500-m. free style—Murray Rose, Australia, 17 min. 58.9 sec.
- †800-m. relay—Australia (Kevin O'Halloran, John Devitt, Murray Rose, Jon Henricks), 8 min. 23.6 sec.
- †Springboard diving—Bob Clotworthy, Mountainside, N.J., 159.56 points.
- †Platform diving—Joaquin Capilla, Mexico, 152.44 points.
- *200-m. butterfly—Bill Yorzyk, Northampton, Mass., 2 min. 19.3 sec.

Swimming, Women

- *100-m. free style—Dawn Fraser, Australia, 1 min. 2 sec.
- *100-m. backstroke—Judy Grinham, Great Britain, 1 min. 12.9 sec.
- *100-m. butterfly—Shelley Mann, Arlington, Va., 1 min. 11 sec.
- 200-m. breast stroke—Ursula Happe, Germany, 2 min. 53.1 sec.
- *400-m. free style—Lorraine Crapp, Australia, 4 min. 56.6 sec.
- †400-m. free-style relay—Australia (Dawn Fraser, Faith Leech, Sandra Morgan and Lorraine Crapp), 4 min. 17.1 sec.
- †Springboard diving—Mrs. Pat Keller McCormick, Lakewood, Calif., 142.36 points.
- †Platform diving—Mrs. Pat McCormick, Lakewood, Calif., 84.85 points.

Track and Field, Men

- *100-m. dash—Bobby Morrow, San Benito, Tex., 10.5 sec.
- *200-m. dash—Bobby Morrow, San Benito, Tex., 20.6 sec.
- *400-m. run—Charley Jenkins, Cambridge, Mass., 46.7 sec.
- *800-m. run—Tom Courtney, Livingston, N.J., 1 min. 47.7 sec.
- *1,500-m. run—Ron Delany, Ireland, 3 min. 41.2 sec.
- *5,000-m. run—Vladimir Kuts, U.S.S.R., 13 min. 39.6 sec.
- *10,000-m. run—Vladimir Kuts, U.S.S.R., 28 min. 45.6 sec.
- *110-m. high hurdles—Lee Calhoun, Gary, Ind., 13.5 sec.
- *400-m. hurdles—Glenn Davis, Clinton, Ohio, 50.1 sec.
- †400-m. relay—United States (Walter Baker, Lea King, Ira Murchison and Bobby Morrow), 39.5 sec.
- †1,600-m. relay—United States (Tom Courtney, Charley Jenkins, Jesse Mashburn and Lou Jones), 3 min. 4.8 sec.
- *3,000-m. steeplechase—Chris Brasher, Great Britain, 8 min. 41.2 sec.
- *50-km. walk—Norman Read, New Zealand, 4 hr. 30 min. 42.4 sec.
- †Broad jump—Gregory Bell, Bloomington, Ind., 25 ft. 8 1/4 in.
- *Shot-put—Parry O'Brien, Travis Air Force Base, California, 60 ft. 11 in.
- *Discus throw—Al Oerter, New Hyde Park, L.I., 184 ft. 10 1/2 in.
- *Hammer throw—Harold Connolly, Boston, Mass., 207 ft. 3 1/2 in.
- *Javelin throw—Egil Danielsen, Norway, 281 ft. 2 1/4 in.
- *Hop, step and jump—Adhemar Ferreira Da Silva, Brazil, 53 ft. 7 1/2 in.
- *High jump—Charley Dumas, Los Angeles, Calif., 6 ft. 11 1/4 in.
- *Pole vault—Bob Richards, La Verne, Calif., 14 ft. 11 1/2 in.
- *Marathon—Alain Mimoun, France, 2 hr. 25 min.
- *Decathlon—Milton Campbell, Plainfield, N.J., 7,937 points.
- †20-km. walk—Leonid Spirine, U.S.S.R., 1 hr. 31 min. 27 sec.

Track and Field, Women

- *100-m. dash—Betty Cuthbert, Australia, 11.5 sec.
- *200-m. dash—Betty Cuthbert, Australia, 23.4 sec.
- †400-m. relay—Australia (Shirley Strickland de la Hunty, Norma Croker, Fleur Mellor and Betty Cuthbert), 44.5 sec.
- *80-m. hurdles—Shirley Strickland de la Hunty, Australia, 10.7 sec.
- *Broad jump—Elzbieta Krzesinska, Poland, 20 ft. 9 3/4 in.
- *Discus throw—Olga Fikotova, Czechoslovakia, 176 ft. 1 1/2 in.
- *High jump—Mildred McDaniel, Atlanta, Ga., 5 ft. 9 1/4 in.
- *Javelin throw—Inessa Iaconzem, U.S.S.R., 176 ft. 8 in.
- *Shot-put—Tamara Tychkevitch, U.S.S.R., 54 ft. 5 in.

Water Polo

†Team—Hungary.

Weight Lifting

- *Bantamweight—Charley Vinci, York, Pa., 753.5 lb.
- *Featherweight—Isaac Berger, Brooklyn, N.Y., 776.5 lb.
- *Lightweight—Igor Rybak, U.S.S.R., 837.5 lb.
- *Middleweight—Fedor Bogdanovskii, U.S.S.R., 925.75 lb.
- *Light heavyweight—Tommy Kono, Sacramento, Calif., 986.25 lb.
- *Middle heavyweight—Arkadii Vorobiev, U.S.S.R., 1,019.25 lb.
- *Heavyweight—Paul Anderson, Toccoa, Ga., 1,102 lb.

Wrestling, Free Style

- *Flyweight—Marian Tsalkalmanidze, U.S.S.R.
- *Bantamweight—Mustafa Dagistanli, Turkey.
- *Featherweight—Shozo Sasahara, Japan.
- *Lightweight—Emamli Habibi, Iran.
- *Welterweight—Mistro Ikeda, Japan.
- *Middleweight—Nikola Nikolov, Bulgaria.
- *Light heavyweight—Gholam Takhti, Iran.
- *Heavyweight—Hamid Kaplan, Turkey.
- †Team—Turkey, 39 points.

Wrestling, Graeco-Roman

- *Flyweight—Nikolai Soloviev, U.S.S.R.
- *Bantamweight—Konstantin Vyropae, U.S.S.R.
- *Featherweight—Rauno Mäkinen, Finland.
- *Lightweight—Kyosti Lehtonen, Finland.
- *Welterweight—Mithat Bayrak, Turkey.
- *Middleweight—Vuivi Kortzosa, U.S.S.R.
- *Light heavyweight—Valentine Nikolaev, U.S.S.R.
- *Heavyweight—Anatolii Parfenov, U.S.S.R.

Yachting

- *5.5-m. class—Sweden, "Rush V," 5,527 points.
- *Star class—United States, "Kathleen," Evanston, Ill., 5,876 points.
- *Dragon class—Sweden, "Slaghoken II," 5,723 points.
- *Dinghy Finn class—Denmark, Paul Elvstrom, 7,509.
- *Harpie class—New Zealand, "Jest," 6,086 points.

*Olympic games record. †Olympic and world record. ‡Ties world record.

WINTER OLYMPIC CHAMPIONS, 1956

Bobsledding

- *Two-man—Italy's No. 1 team, Lamberto Dalla Costa and Giacomo Conti, 5 min. 30.14 sec.
- *Four-man—Switzerland's No. 1 team, Franz Kapus, Gottfried Diener, Robert Alt and Heinrich Angst, 5 min. 10.44 sec.

Figure Skating

- Men—Hayes Alan Jenkins, U.S., 166.4 points.
- Women—Tenley Albright, U.S., 169.6 points.
- Pairs—Elisabeth Schwartz and Kurt Oppelt, Austria, 11.31 points.

Skiing, Men

- Jumping—Antti Hyvärinen, Finland, 227 points.
- Special slalom—Anton (Toni) Sailer, Austria, 3 min. 14.7 sec.
- Giant slalom—Anton Sailer, Austria, 3 min. 0.1 sec.
- Downhill—Anton Sailer, Austria, 2 min. 52.2 sec.
- 15-km. cross-country—Hallgeir Brenden, Norway, 49 min. 39 sec.
- 30-km. cross-country—Veikko Hakulinen, Finland, 1 hr. 44 min. 6 sec.
- 50-km. cross-country—Sixten Jernberg, Sweden, 2 hr. 50 min. 27 sec.
- Nordic combined—Sverre Stenersen, Norway, 445 points.
- 40-km. relay—U.S.S.R., Fyodor Terentiev, Pavel Kolchin, Nikolai Anikin and Vladimir Kuzin, 2 hr. 15 min. 30 sec.

Skiing, Women

- Special slalom—Renee Colliard, Switzerland, 1 min. 52.3 sec.
- Giant slalom—Ossi Reichert, Germany, 1 min. 56.5 sec.
- Downhill—Madeleine Berthod, Switzerland, 1 min. 40.7 sec.
- 10-km. cross-country—Lyubov Kozyreva, U.S.S.R., 38 min. 11 sec.
- 15-km. relay—Finland, Sirka Polkunen, Mirja Hietamies, Siri Rantanen, 1 hr. 9 min. .01 sec.

Speed Skating

- *500 m.—Yevgeni Grishin, U.S.S.R., 40.2 sec.
- *1,500 m.—Grishin and Yuri Mikhailov, U.S.S.R., tied for first, 2 min. 8.6 sec.
- †5,000 m.—Boris Shilkov, U.S.S.R., 7 min. 48.7 sec.
- †10,000 m.—Sigge Ericsson, Sweden, 16 min. 35.9 sec.

Ice Hockey

†Team—U.S.S.R.

*Olympic and world record. †Olympic games record.

(T. V. H.)

Oman and Muscat (Masqat): see MUSCAT AND OMAN.

Ontario. Largest in population, second largest in area, the province of Ontario was an original member of the confederation in 1867. Area, 412,582 sq.mi. Pop.: (1951 census) 4,597,542, (1956 est.) 5,300,000. Capital, Toronto (*q.v.*) (1951) 675,754, (official est., 1956) 681,857. Metropolitan Toronto, an administrative area comprising 13 contiguous municipalities, had an estimated 1956 population of 1,304,363. Other large cities (1951 census, 1956 est. in parentheses) were: the twin cities of Kitchener-Waterloo 56,858 (75,482); and Windsor 120,049 (120,525). Others with 1951 census figures, were: London, 95,343, Ottawa (*q.v.*) 202,045, Hamilton 208,321.

History.—New legislation in 1956 was directed toward facilitating industrial expansion, which brought the value of manufactures to a new high of \$9,600,000,000, a gain of 15.6% over 1955. First midterm census compilations for Ontario showed a shift of rural dwellers to urban centres, as industry expanded. A legislative result was the establishment by the Ontario government of a Water Resources commission, with wide powers to augment local urban water supplies from the Great Lakes or other sources by pumping stations and a system of mains.

Other new legislation in 1956 included setting up a Hospitals commission to regulate the future location and type of hospitals to be built in order to provide maximum service at minimum capital cost. Passage of national legislation to finance a natural gas pipeline (Trans-Canada) from western Canada to Ontario, and rapid development of new electrical sources on the St. Lawrence river by the Hydro-Electric Power commission, spurred industrial expansion in most urban areas.

Education.—An increase of 62,000 in public- and secondary-school enrolment over 1955 raised the population in these schools to 1,050,000. In 1955-56, 2,300 new classrooms were provided at a cost of \$59,500,000. In fiscal 1956-57 provincial grants were set at \$5,800,000, distributed on the basis of average daily attendance. With other grants to these schools, the aggregate would be \$84,000,000. Grants to universities were raised to a total of \$16,000,000, and to agricultural and veterinary colleges, to \$24,982,000. Over-all educational costs were budgeted for the fiscal year at \$117,000,000, equivalent to 28% of all estimated ordinary revenue for the period.

Public Health and Welfare.—Appropriations for health (1956-57) totalled \$65,900,000, up \$5,000,000; for welfare \$31,300,000, up \$2,900,000. Special capital grants for hospitals and other health totalled \$8,600,000. Standard grants were increased to \$21,400,000, with 2,219 active treatment beds and 456 chronic beds under construction. Costs for mental patient care were placed at \$26,900,000 with upward of 20,000 patients in mental hospitals. Provincial payments on capital account for welfare establishments were budgeted at \$2,900,000.

Transportation and Communication.—Combined capital and ordinary expenditure on highways for fiscal 1956-57 was placed at more than \$210,

000,000, up \$53,000,000. Road subsidies to municipalities rose to \$50,000,000, matching local costs for capital and maintenance accounts. In 1955 there were 6,200 mi. of provincial highways and 78,000 mi. of municipal roads. Motor vehicles registered in 1955 totalled 1,617,000.

Banking and Finance.—On March 1, 1956, the government reported a surplus on ordinary account of \$749,000, from net revenues of \$411,342,000. The net balance carried to surplus account was after a special allocation of \$17,630,000 to sinking funds. For the fiscal year 1956-57 a net surplus of \$768,000 was forecast, after allotting \$17,729,000 to sinking funds from net ordinary revenue of \$420,519,000. Gross net capital debt rose to \$1,066,161,000 as of March 31, 1955, with net debt at \$661,000,000, up \$30,600,000. Canadian chartered banks had 1,528 branches in Ontario. Credit unions had more than 1,300 branches serving 350,000 members, assets exceeding \$100,000,000, and in 1955 disbursed loans totalling \$2,260,363. Province of Ontario Savings office (1956) had 21 branches, more than 80,000 depositors, and total deposits of \$79,700,000.

Agriculture.—Gross value of agricultural production in 1955 gained slightly to an aggregate of \$1,041,760,000. Cash income rose to \$744,108,000, a gain of \$29,729,000. The index of farm living costs fell to 201.6 from 202 (1935-39=100). Late seeding and bad weather for maturing crops reduced the gross value of crops, and the official estimate for cash income was a 3% drop for 1956.

Manufacturing.—Output in 1955 rose to a new peak of \$9,800,000,000. In July 1956 persons at work totalled 2,140,000, about 40% of the national total. Industrial establishments at Jan. 1, 1956, totalled 13,300,000, with direct wage and salary payments running at \$2,050,000,000 annually.

Mining.—Mining production (1955) totalled \$578,000,000, up from \$503,700,000 in 1954. An official estimate for 1956 placed current production in excess of \$720,000,000 as a result of production from new uranium, base metals and iron ore sources. The new record total for 1955 included: metallics \$467,300,000, nonmetallics \$15,700,000, structural materials \$88,900,000, fuels \$6,000,000. (C. A. Sn.)

Opera: see MUSIC.

Ophthalmology: see EYE, DISEASES OF THE.

Oranges: see FRUIT.

Orchestras: see MUSIC.

Oregon. A state of the United States, located in the Pacific northwest, Oregon was admitted Feb. 14, 1859, as the 33rd state. Area: 96,981 sq.mi., including 666 sq.mi. of water. Pop.: (1950 census) 1,521,341; (July 1, 1956, provisional est.) 1,718,000. Capital: Salem (43,140 in 1950). Chief city: Portland (373,628).

History.—In the 1956 election Oregon voters gave the Republican presidential ticket of Dwight D. Eisenhower and Richard M. Nixon a lead of 77,000 over the Democratic ticket of Adlai E. Stevenson and Estes Kefauver. In 1952 the Eisenhower lead over Stevenson was 150,000. Democratic candidates were successful in most of the other state and national contests electing three of the state's four congressmen, the governor and attorney general. Democrats gained a majority in the 1957 state house of representatives, and an even division with the Republicans in the state senate.

Voters defeated a constitutional amendment to permit use of the emergency clause on legislative tax measures, and a bill for a cigarette tax. They approved a bill prohibiting certain commercial fishing in coastal streams south of the Columbia river.

Elective state officials (administrative) in 1956 were: governor, Elmo Smith (following the death of Gov. Paul Patterson in Jan. 1956); secretary of state, Earl T. Newbry; treasurer, Sig Unander; attorney general, Robert Y. Thornton; labour commissioner, Norman O. Nilsen; superintendent of public instruction, Rex Putnam.

Education.—Enrolment in public schools for the school year 1954-55 was 324,775, including 79,434 high school students. The number of classroom teachers employed was 12,334, and the average professional salary was \$4,339. Total operating expenses of public schools were \$97,980,388 for the year 1954-55. Average cost per pupil in daily attendance was \$343.86. Total capital outlays, including debt service, for the year were \$39,263,604.

Total enrolment in the eight campus units of the state system of higher education for the year 1955-56 was 19,571. Enrolment in extension courses was 14,010. Total operating expenses of the state system were \$22,888,672 for the year. State appropriation for capital outlay for the biennium ending June 30, 1957, was \$4,021,569.

Social Insurance and Assistance, Public Welfare and Related Programs.—Expenditures for the year ending June 30, 1956, under the state public welfare program, including cost of administration, were \$31,679,819. The program embraces general assistance, old-age assistance, aid to the blind, to dependent children and to permanently and totally disabled, and foster care. Payments for unemployment compensation in the fiscal year 1955-56 were \$18,242,545. Highest number of weekly payments during the year was

32,558. As of June 30, 1956, the number of persons actively seeking employment was estimated at 18,000.

The number of inmates in 11 state health, penal, correctional and eleemosynary institutions as of June 30, 1956, was 9,402. Total operating costs for the institutions for the fiscal year ending June 30, 1956, were \$11,837,944. Expenditures of the state commission for the blind were \$282,715 for the year 1955-56.

Communications.—Steam railway mileage in Oregon as of Dec. 31, 1955, was 3,527 mi. of main line, operated by 24 common carriers. One electric railway operated 37.4 mi. of main line.

Total mileage of the state highway system on June 30, 1956, was 7,437, of which 7,067 mi. were surfaced. Total mileage of county roads was 30,545, of which 19,876 mi. were surfaced. Total number of miles of roads in national and state forests, parks and reservations and nonhighway city streets was 24,530, of which 11,529 mi. were surfaced. Total expenditure of the state highway department in the year ending June 30, 1956, was \$58,552,515.

The total number of passenger automobiles registered in the state during 1955 was 737,745; trucks 78,524; buses 1,488. The number of telephones in service as of Dec. 31, 1955, was 556,211.

Banking and Finance.—The state bonded debt as of July 1, 1956, was: gross \$171,569,000, net \$114,339,530. The gross debt of municipal subdivisions as of July 1, 1954, was \$223,241,336, the net debt \$209,532,026.

State treasury receipts from all sources for the fiscal year ending June 30, 1956, were \$402,821,790. Total assessed valuation of property as of Jan. 1, 1956, was \$2,046,911,258.

Bank deposits on June 30, 1956, totalled \$1,818,974,900. On that date there were 39 state banks and 13 national banks in operation. Branch banking is permitted.

The total number of corporations registered in Oregon as of June 30, 1956, was 18,881, of which 10,659 were profit corporations.

Agriculture.—Cash receipts from farming in Oregon for 1955 were: all commodities \$399,919,000, divided into crops, \$230,352,000, and livestock and livestock products, \$169,567,000. Government payments to farmers amounted to \$2,589,000. Livestock on farms as of Jan. 1, 1956: all

Table I.—Principal Crops of Oregon

Crop	Indicated 1956	1955	Average 1945-54
Wheat, bu.	25,828,000	21,899,000	26,804,000
Corn, bu.	1,820,000	2,562,000	1,157,000
Oats, bu.	11,280,000	9,315,000	9,246,000
Barley, bu.	22,306,000	17,888,000	11,122,000
Potatoes, cwt.	8,460,000	7,645,000	7,457,000
Hay, tons	2,000,000	1,798,000	1,799,000
Apples, bu.	1,670,000	2,350,000	2,655,000
Bartlett pears, bu.	2,760,000	2,700,000	2,118,000
Other pears, bu.	3,950,000	3,350,000	3,333,000
Prunes, tons	53,900	52,600	60,220
All cherries, tons	16,500	34,800	24,350
Peaches, bu.	400,000	400,000	493,000
Hops, lb.	4,560,000	4,602,000	15,241,000
Filberts, tons	2,800	7,400	6,990
Walnuts, tons	2,000	5,400	7,480

Source: U.S. Department of Agriculture.

cattle 1,456,000 head; sheep and lambs 830,000; hogs 157,000; horses 48,000; chickens 3,623,000; turkeys 289,000.

Manufacturing and Industry.—Oregon is the principal lumber manufacturing state in the nation. The cut of logs in 1955 was 9,719,878,000 bd.ft. Total lumber manufacture in 1955 was 8,850,000,000 bd.ft. Plywood manufacture in 1955 was 2,753,398,200 sq.ft., $\frac{3}{8}$ -in. basis.

Tourist travel is rated as the state's third most important industry. Tourist expenditures in Oregon in 1956 were estimated at \$141,000,000. (C. A. Sp.)

Mineral Production.—Table III shows the tonnage and value of those minerals produced in Oregon in 1953 and 1954 whose value exceeded \$100,000. In 1954 the state was third among the states in chromite and di-

Table II.—Principal Industries of Oregon

	All employees 1954	Salaries and wages 1954 (in 000s)	Value added by manu- facture 1954 (in 000s)	Value added by manu- facture 1953 (in 000s)
Food and kindred products	18,887	\$68,867	\$120,945	\$137,604
Textile mill products	2,767	10,463	13,150	12,944
Lumber and products (except furniture).	76,413	324,622	585,135	532,730
Furniture and fixtures	1,844	7,083	11,767	12,733
Paper and allied products	6,030	27,449	64,976	67,160
Electrical machinery	1,161	5,042	10,463	11,173
Transportation equipment	2,463	11,429	16,331	*

*Preliminary.
†Total has been adjusted to eliminate duplication in the value of clays and stone.

Source: U.S. Department of Commerce, 1954. Census of Manufactures, preliminary report.

Table III.—Mineral Production of Oregon

(Short tons, except as noted)				
Mineral	Quantity	Value	Quantity	Value
Total		\$24,449,000		\$32,268,000†
Clays	292,000	296,000	?	?
Gold (oz.)	8,000	297,000	7,000	228,000
Mercury (flasks, 76 lb.)	648	125,000	489	129,000
Pumice	73,000	174,000	68,000	178,000
Sand and gravel	8,763,000	8,630,000	13,157,000	14,149,000
Stone	4,939,000	6,302,000	5,872,000	8,618,000
Other minerals . . . . .	...	8,625,000	...	10,189,000

*Preliminary.

†Total has been adjusted to eliminate duplication in the value of clays and stone.

‡Value included with other minerals.

Source: U.S. Bureau of Mines.

omite output and fifth in pumice, and ranked 38th in the value of its mineral output, with 0.23% of the U.S. total.

ENCYCLOPÆDIA BRITANNICA FILMS.—*Far Western States*, 2nd ed. (1956); *Oregon* (1955).

Organization for European Economic Cooperation:
see INTERNATIONAL TRADE.

Organization of American States. The Organization of American States in 1956 functioned pursuant to the terms of the charter signed at Bogotá, Colombia, in 1948. It was a continuation of the system of inter-American relations which had its inception in 1890 when the first Pan American conference met in Washington, D.C., and established the Pan American Union. Through the organization the 21 American republics seek to achieve an order of peace and justice, promote their solidarity, strengthen their collaboration and defend their sovereignty, territorial integrity and independence. The organization functions through six organs, namely, the Inter-American conference, the meetings of consultation of ministers of foreign affairs, the council of the organization, the Pan American Union, the specialized conferences and the specialized organizations.

The outstanding event of 1956 was the meeting in Panamá of the presidents of the American republics, a meeting originated by a decision by the council of the Organization of American States to hold in the city of Panamá a commemorative meeting in honour of the 1826 Congress of Panamá convoked by Simón Bolívar. Subsequent to this action, the president of Panamá invited the presidents of the other American republics to a meeting which would coincide with the commemorative session agreed upon by the council of the organization. The commemorative meeting was held in Panamá, July 18–22, 1956, with the participation of presidents from 16 countries. Bolivia, El Salvador and Peru were represented by their presidents-elect; Colombia and Honduras were not represented.

The principal feature of the meeting was the signing of the Declaration of Panamá in which the chiefs of state reiterated certain fundamental principles governing the relations among the American republics. U.S. Pres. Dwight D. Eisenhower proposed that each president designate a representative to serve on a committee to make the Organization of American States a more effective instrument and to formulate practical suggestions in the economic, financial, social and technical fields which the organization might adopt. This committee met in Washington on Sept. 17, 18 and 19 for a preliminary exchange of views and to receive suggestions from each participant and agreed to hold a further meeting early in 1957.



MEETING OF THE 1956 INTER-AMERICAN CONFERENCE at Washington, D.C., Sept. 17, 1956. Representatives of the 21 American republics were present

At the meeting in Panamá, the president of Venezuela, Gen. Marcos Pérez Jiménez, proposed the creation of a special fund to be used for economic development purposes. This suggestion was formalized in a communication from the minister of foreign affairs of Venezuela to the Organization of American States presented at a meeting of the council of the organization on Sept. 13, 1956. It proposed that each member state of the organization contribute a fixed percentage of its national budget to a common fund, and stated that Venezuela was disposed to contribute up to 3.75% or \$32,000,000. The proposal was transmitted to all the member states of the organization for comment, and March 6, 1957, was fixed as the date for a meeting of the council to further consider the proposal.

As a sequel to the situation that occurred in 1955 between Costa Rica and Nicaragua, and that gave rise to the application of the Inter-American Treaty of Reciprocal Assistance, representatives of the two countries signed two agreements on Jan. 9, 1956, at a ceremony held at the Pan American Union. One agreement embodied the measures to be taken by both parties to avoid a repetition of the 1955 incident; the other related to the organization and functioning of a commission of investigation and conciliation which would be permanently at the disposition of the two parties should any situation develop that might jeopardize relations between them.

On May 9, 1956, the council of the organization approved the statutes of the Inter-American Peace committee which was charged with the responsibility of seeking the solution of conflicts that might arise among the American republics, and of making its facilities available to the interested parties. At the meeting of Aug. 6, the council selected the five countries to constitute the committee and designated Mexico for five years, the United States for four, Brazil for three, Argentina for two and Cuba for one year.

The third meeting of the Inter-American Council of Jurists was held in Mexico from Jan. 17 to Feb. 4, 1956. Among the conclusions adopted was a declaration of jurisdiction over territorial waters which stated that each state was competent to fix its territorial waters within reasonable limits, taking into consideration geographical, geological and biological factors as well as the economic needs of its populations, its security and defense. In the light of claims advanced by a number of Latin-American countries to jurisdiction over territorial waters extending 200 mi. off the coast, this declaration assumed great importance and gave added emphasis to the Specialized Conference on the Continental Shelf and Marine Waters which met in Ciudad Trujillo, Dominican Republic, March 15 to 28, 1956. The resolution adopted at that meeting recognized that the sea bed and subsoil of the continental shelf appertain to the riparian state but declared that agreement does not exist with respect to the juridical regime of the waters which cover the said submarine areas nor with respect to the problem of whether certain living resources belong to the sea bed or to the maritime waters. It was agreed that this problem required further study.

Other inter-American meetings held during 1956 included the second Inter-American Conference of Ministers of Education and the second meeting of the Inter-American Cultural council, both of which met in Lima, Peru, in May 1956 simultaneously with a regional meeting of UNESCO (the United Nations Educational, Scientific and Cultural organization) on fundamental education. An Inter-American Port and Harbor conference was held in San José, Costa Rica, in April 1956; the Inter-American Commission of Women held its 11th assembly in Ciudad Trujillo in June; and in September the directing council of the Pan American Sanitary organization met in Guatemala. The council of the organization and the Inter-American Economic and Social council took preliminary steps for the holding of an economic conference

at Buenos Aires, Arg., in Aug. 1957.

The Inter-American Economic and Social council in 1956 continued to sponsor a program of technical co-operation of the Organization of American States in conjunction with the inter-American specialized organizations and the Pan American Union, which consisted of a training centre in economic and financial statistics in Santiago, Chile, sponsored by the Pan American Union and the Inter-American Statistical institute; an inter-American housing centre located in Bogotá, and a centre for training rural normal-school teachers in Venezuela, both sponsored by the Pan American Union; a centre in Brazil for the evaluation of natural resources organized by the Pan American Institute of Geography and History; workshops on the administration of children's services conducted by the American International Institute for the Protection of Childhood; a research and training institute on foot-and-mouth disease conducted in Brazil by the Pan American Sanitary bureau; and a comprehensive program of education in agricultural and rural life organized by the Inter-American Institute of Agricultural Sciences.

(W. Mr.)

Osteopathy. Doctors of osteopathy consider the musculoskeletal system as fundamentally important in an approach to the problems of health and disease. Their frequent employment of osteopathic manipulative treatment is a distinctive characteristic of osteopathic care of the patient. To become an osteopathic physician, the student must have successfully completed four years of high school, three years of pre-medical training in an accredited college or university and four years of professional education in one of the six approved osteopathic colleges in the United States. A 12th educational year consists of an internship in an osteopathic hospital approved for intern and resident training. Postgraduate training in the common fields of specialized medicine is provided and leads to certification in a given specialty, such as surgery, obstetrics, psychiatry, internal medicine, etc.

In 1956 more than 13,000 doctors of osteopathy were in practice, the majority of whom were members of the American Osteopathic association with headquarters at 212 E. Ohio St., Chicago 11, Ill. Its president for 1956-57 was Robert D. McCullough, Tulsa, Okla. The 61st annual convention was to be held in Dallas, Tex., in July 1957.

(R. P. K.)

O.T.C. (Organization for Trade Cooperation): *see* **TARIFFS.**

Ottawa. The capital of Canada, located at the confluence of the Gatineau, Rideau and Ottawa rivers, in the province of Ontario, Ottawa covers 47.6 sq.mi. Pop.: (1951 census) 202,045, (1956 est.) 216,662; tax assessment (1956) \$377,053,000.

Mayor Charlotte Whitton continued in office during 1956 and at the inaugural meeting of the council on Jan. 3 said that because of new and realigned assessments and the more just assumption of federal government tax-lieu payments, the tax rate had been lowered or kept relatively stable and taxes had also been equalized. The city's budget had risen from roughly \$15,500,000 in 1950 to \$23,180,955 in 1955, but the percentage thereof required from taxation revenue had actually dropped from 68.13% to 66.65%, because of increased tax-lieu payments of federal authorities from 6.87% to 9.45% of the total and increased grants from the province of Ontario from 4.28% to 6.91%.

In spite of tremendous expansion, general debt charges at 16.83% of expenditures were a smaller proportionate item than in 1950 at 20.82%, the heaviest increase being in education,

which it was estimated would take practically 30% of all expenditures in 1955 against 24.5% in 1950, this being 49.9 cents of every tax dollar.

As the result of an architectural competition in which 37 entries were received, the board of assessors reported to the city council in Jan. 1956 that it approved as the winning design for a new city hall building that of Rother, Bland and Trudeau, of Montreal, and the council accepted the recommendation, selecting Green Island at the mouth of the Rideau river as the site for the new city hall. A program for improving facilities at the Ottawa Civic hospital at a cost of \$1,500,000 was approved by the council.

Because of the tremendous increase in traffic within the city's limits in 1956, a department of traffic engineering services was established and, by virtue of special legislation, a parking authority was set up.

The city of Ottawa presented a brief to the Royal Commission on Economic Resources and another brief to the joint senate-commons committee on federal district commission operations, suggesting in the last-mentioned presentation that the city might be forced to stop temporarily the development of new subdivisions because it faced such heavy capital expenditures for services to new housing schemes. As an alternative to such action, the city might decide to force developers to provide full local services for their subdivisions, causing them to pay in full for roads, water, sewers, electricity and possibly a contribution toward school facilities.

In 1956 the federal government's grant to Ottawa was set at \$2,800,000, with provincial grants at \$1,700,000 and other revenue amounting to \$1,100,000.

(M. L. S.)

ENCYCLOPEDIA BRITANNICA FILMS.—*Industrial Provinces of Canada* (1943).

Outer Mongolia: *see* **MONGOLIAN PEOPLE'S REPUBLIC.**

Pacific Islands, British. Under this heading are grouped the territories administered by the high commissioner for the western Pacific.

Area	Area (sq.mi.)	Population†
British Solomon Islands protectorate*	11,500	103,000
Gilbert and Ellice Islands colony†	369	40,000
Central and Southern Line islands }		
Totals	11,869	143,000

*With the Santa Cruz, Lord Howe (Ontong Java), Reef and Duff groups and Mitre Island.
†With Phoenix and Northern Line islands and Ocean Island. Phoenix Islands include Canton, an Anglo-U.S. condominium with international airport; and Northern Line Islands include Christmas Island with international sea aerodrome.

‡1955 est.

The New Hebrides (*q.v.*), an Anglo-French condominium, also are administered by the western Pacific high commissioner.

Populations: Melanesians predominate in Solomons, Micronesians in Gilbert and Ellice Islands. Headquarters: Honiara (pop. about 2,000), on Guadalcanal, Solomon Islands. High commissioner in 1956, John Gutch; resident commissioner, Gilbert and Ellice Islands, M. L. Bernacchi.

History.—The British prime minister, Sir Anthony Eden, announced in June that it had been decided to carry out a limited number of nuclear test explosions in the megaton range, during the first half of 1957, in a remote part of the Pacific ocean, far from any inhabited islands. The main base of the aircraft taking part would be Christmas Island.

In the Solomons work began on the restoration of the Henderson and Munda airfields abandoned after World War II. In Honiara a new radio station for aeronautical communications was completed. The World Health organization conducted a four-month campaign against yaws. The future of the cocoa scheme in which the government co-operated with Unilevers Pacific Ltd. was rendered uncertain by the unsuitability of the soils in the

area selected for development.

(D. W. F.)

Education.—*Solomon Islands* (schools, 1955): government primary 6, native council primary 3, higher primary 1 (92 pupils); Chinese 1, European 1, mission schools 5. *Gilbert and Ellice Islands* (schools, 1955): primary 264, pupils 8,627; secondary 1, pupils 60. *Fiji* (schools, 1954): primary 456, pupils 58,535, teachers 1,387; secondary 29, pupils 1,932, teachers 105; 1 teacher training school, students 175; Central Medical school, students (1952) 192; educational research institute (established 1952). *Tonga* (schools, 1954): primary 134, pupils 12,830; secondary 7, pupils 2,648. *Tonga* High school (primary and secondary), pupils (1954) 102. Teacher training college 1, students 55, teachers 9. *Pitcairn Island* (1953): 1 primary school, 1 teacher.

Finance and Trade.—Monetary unit: Australian pound (£A1.25=£1 sterling=U.S. \$2.80), used in *Solomon Islands* and *Gilbert and Ellice Islands*. *Fiji* and *Pitcairn* islands use the Fijian pound (£F1.1=£1 sterling); New Zealand and U.K. currencies also circulate in Pitcairn. *Tonga* uses the Tongan pound (£T1=16s. sterling=U.S. \$2.24).

	Revenue	Budgets Expenditure	Foreign Trade Imports	Exports
<i>Solomon Islands</i> (1955 est.)	£A875,487	£A996,341	(1955) £A1,294,827	£A1,999,485
<i>Gilbert and Ellice Islands</i> (1955 est.)	£A497,280	£A453,492	(1955) £A782,013	£A1,458,091
<i>Fiji</i> (1955 est.)	£F5,152,000	£F5,324,000	(1954) £11,642,801	£11,239,985
<i>Tonga</i> (1955 est.)	£430,000	£445,000	(1954) £782,000	£1,080,000
<i>Pitcairn Island</i> (1953 est.)	£F10,699	£F7,284	...	...

Main exports: *Solomon Islands*: copra, scrap metals, timber, trochus shell. *Gilbert and Ellice Islands*: copra, phosphate. *Fiji*: copra, sugar. *Tonga*: copra, bananas.

Pacific Islands, French. Under this heading are grouped two overseas territories of the French union, and the Anglo-French condominium of the New Hebrides (*q.v.*). Areas and populations are:

Territory	Area (sq.mi.)	Population (1951 census)
New Caledonia and dependencies	7,654	65,300*
French Settlements in Oceania	1,544	62,700

*Census of non-natives; estimate of natives.

Population, *New Caledonia* proper (6,533 sq.mi.) and the dependencies: Melanesian with Polynesian admixtures; Europeans 60,415, mainly French; 3,434 Javanese; 4,323 Vietnamese. Seat of commissioner-general: Nouméa, pop. (1951 est.) 20,000. Commissioner-general for the Pacific ocean in 1956, Aimé Grimald.

The *French Settlements in Oceania* consist of the Society Islands (the largest of which is Tahiti), the Marquesas, Tuamotu and other smaller islands. Population: Polynesian, majority Christian; Europeans (1951) 2,347, mainly French; Chinese 8,333. Seat of governor: Papeete, on Tahiti, pop. (1951 census) 55,214. Governor in 1956, Jean Toby.

History.—Elections to the French national assembly were held in January: M. H. Lenormand (Overseas Independent) for New Caledonia and Puvanaa (Peasant) for Oceania both retained their seats.

An agreement was reached under which the Broken Hill Proprietary Co. of Australia was to take deliveries of iron ore from New Caledonia. A direct air service between Paris, Fr., and Nouméa was inaugurated. It was decided that ships of the Messageries Maritimes line were to call regularly at the Marquesas.

On Aug. 30 Gen. Charles de Gaulle landed in Tahiti. In a speech he referred to the widespread tendency toward national autonomy and stressed the need for the peoples of the world to adhere to larger groups.

(See also FRENCH UNION.)

(HU. DE.)

Foreign Trade.—(1955) Monetary unit: franc C. F. P. (Colonies Françaises du Pacifique)=5.5 metropolitan French francs. U.S. \$1=350 metropolitan francs. *New Caledonia*: imports 1,637,000,000 fr. C. F. P., including 639,000,000 fr. C. F. P. from France, 433,000,000 fr. C. F. P. from Australia, 257,000,000 fr. C. F. P. from the U.S.; exports 1,940,000,000 fr. C. F. P., including 1,544,000,000 fr. C. F. P. to France, 159,000,000 fr. C. F. P. to Japan. Principal exports: nickel 1,600,000,000 fr. C. F. P. *Oceania*: imports 701,000,000 fr. C. F. P., including 205,000,000 fr. C. F. P. from France and 224,000,000 fr. C. F. P. from the U.S.; exports 618,000,000 fr. C. F. P., including 337,000,000 to France, 161,000,000 to Japan. Principal exports: copra 229,000,000 fr. C. F. P., phosphates 185,000,000 fr. C. F. P. *New Hebrides*: imports 238,000,000 fr. C. F. P., including 162,000,000 fr. C. F. P. from Australia; exports

250,000,000 fr. C. F. P., including 230,000,000 fr. C. F. P. to France. Principal export copra, 200,000,000 fr. C. F. P.

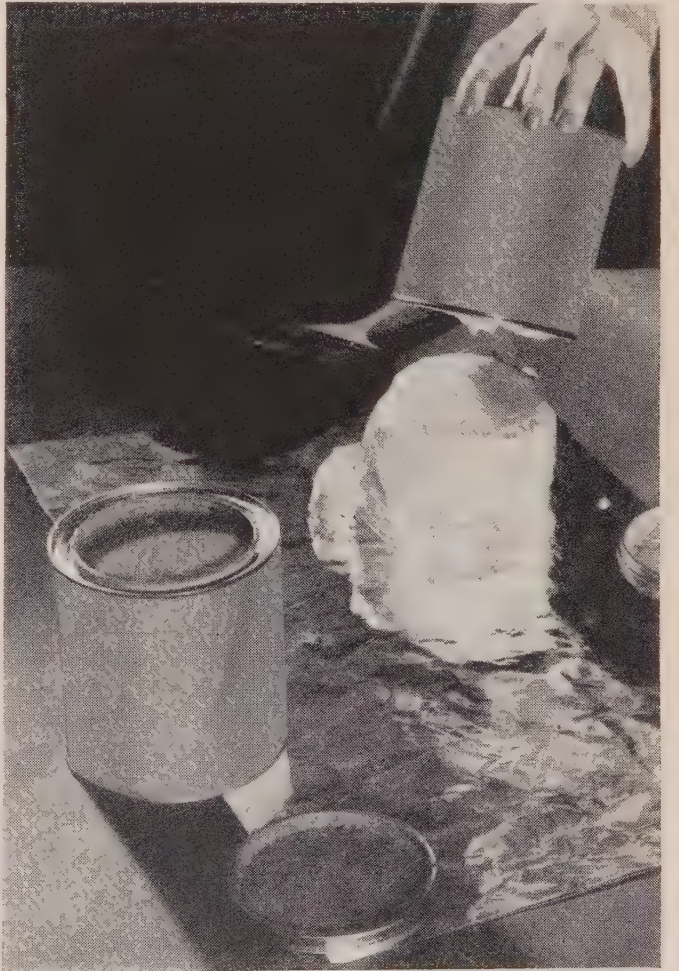
Pacific Islands, U.S.: see GUAM; HAWAII; SAMOA, AMERICAN.

Pacific Islands under Trusteeship: see MARSHALL, CAROLINE AND MARIANA ISLANDS; TRUST TERRITORIES.

Paints and Varnishes. The value of paint production in 1956 in the United States was estimated at \$1,600,000,000 compared with the corrected 1955 total of \$1,516,224,000. This increase was probably restrained somewhat by lower production of automobiles and by a prolonged strike in the steel industry. Small price increases to cover inflated costs were announced by leading producers.

Materials for manufacture of paint were generally in good supply. The linseed crop at 49,000 bu. was the largest since 1948 and the soybean crop at more than 456,000,000 bu. was the largest in history. Safflower oil emerged as a new, major oil for paint and reached a new U.S. high with a 1956 crop of about 40,000,000 lb., almost all grown in California. Castor oil as a domestic crop was encouraged by the joint development by the U.S. department of agriculture and private enterprise of a mechanical harvester and of a new variety of castor beans which ripen more evenly and with lower loss from shattering of pods.

Isophthalic acid came into major production, after engineering delays, and probably constituted the largest single new paint material of the year. New and increased production of synthetic



JELLY PAINT, a product designed for "do-it-yourself" painters and available in 1956. Dumped from the can, as shown, the paint has the consistency of jelly or pudding but immediately thins to painting consistency with the pressure of a brush or roller. Advantages of the new product are that it is virtually driplless and requires no stirring before application

glycerine, trimethylolethane, trimethylolpropane, acrylic esters, vinyl acetate and vinyl toluene gave a wealth of choice for makers of alkyds and other polymers for paint vehicles. Reduction in price of rubber grade styrene to 15 cents and with a future price of 12 cents was important to producers of latex paints and soluble type styrene copolymers.

Two revolutionary automotive production finishes were announced. One was a lacquer based on soluble acrylic polymers with claims of better durability and lessened tar staining than the long established nitrocellulose lacquers. The other, a baking finish related to established household appliance finishes, used non-drying, oil-modified alkyds in place of soybean or other drying oil alkyds, each in conjunction with melamine or urea resins. A baking type enamel based on acrylic polymers was announced.

Coating of metal parts by dipping the heated parts into air-fluffed beds of pigmented, powdered plastics was introduced by two custom finishers. This novel method of finishing competed with both the plastisol technique which had grown rapidly in the past decade and the much older methods of brushing, dipping, spraying, etc. Tube packages were extended beyond their established use for tinting colours to contain a ready-to-use paint of thixotropic consistency. Aerosol packages of paint increased steadily in popularity with the consuming public.

Scientific papers on paint-related subjects showed wide interest in coatings from copolymers of toluene diisocyanate with polyesters and with raw castor oil. Nuclear radiation was used to polymerize styrene-polyester combinations and tung and other fatty oils. Visible radiation was studied both for the mechanism of its effect on degradation of paint films and for its polymerization of paint vehicles with catalysis by organic dyes. The scientific aspects of colour matching of practical paints received industry-wide attention with the offering of several commercially produced colour meters.

(Jo. C. W.)

Pakistan. A member of the Commonwealth of Nations in the Indian subcontinent, Pakistan is a federal Islamic republic, comprising two provinces. East Pakistan, with 55% of the population, is in the northeastern part of the subcontinent, 850 mi. by air from West Pakistan in the northwest. Karachi (pop., 1951 census, 1,126,000), the federal capital, is geographically in West Pakistan.

Province	Capital (pop. 1951 census)	Area (sq.mi.)	Population (1951 census)
West Pakistan	Lahore (849,476)	310,236*	33,779,165*
East Pakistan	Dacca (276,033)	54,501	42,063,000
Total		364,737	75,842,165†

*Including small areas in Karachi not part of West Pakistan province but reserved to the federal government. Excluding Kashmir (q.v.), under dispute between India and Pakistan. †1954 est. 80,167,000.

Language: Urdu (official, and widely understood), Punjabi, Sindhi, Pushtu, Baluchi and Gujarati in West Pakistan; Bengali (official) in East Pakistan; English used for many official purposes and higher education. Religion: Moslem 85.7%; Hindu 12.8%; Christian 0.7% *i.e.*, about 539,000; Sikh, Parsee and other minorities. Chief towns other than federal and provincial capitals (pop., 1951 census, including cantonments): Hyderabad 241,801; Rawalpindi 237,219; Multan 190,122; Lyallpur 179,144; Sialket 167,543; Peshawar 151,776; Chittagong 145,777; Gujranwala 120,860; Quetta 84,343. Acting president Maj. Gen. Iskander Mirza. Prime ministers in 1956: Mohammed Ali and (from Sept. 12) H. S. Suhrawardy.

History.—On Feb. 29, 1956, the constitution which had been under preparation since 1947 was finally passed in the constituent assembly by the Moslem league majority against the opposition of the Awami league and the Congress party members, who objected to certain limitations in the provincial autonomy of East Pakistan and to the reservation of the office of president



PAKISTAN TROOPS ON REVIEW for U.S. Secretary of State John Foster Dulles during his visit to Karachi to attend a conference of the Southeast Asia Treaty organization in March 1956

of Pakistan for Moslems. This constitution made Pakistan a federal Islamic republic, while ensuring to all citizens such fundamental rights as freedom of religion, freedom of speech and assembly, equality of status and protection of property. The national assembly would consist of 300 members elected by adult suffrage; the provincial assemblies of East Pakistan and West Pakistan would be similar in size. In all three bodies ten seats were reserved for women for the first ten years. The cabinet was to be responsible to the legislature. English (for 20 years), Urdu and Bengali were recognized as official languages. Administrative powers were divided between the centre and the provinces according to three lists of subjects—federal, concurrent and provincial. On March 2 the assembly decided by 42 votes to 2 to remain within the commonwealth. On March 5, Maj. Gen. Iskander Mirza, the governor general, was chosen as provisional president until such time as general elections based on adult suffrage should provide the permanent electoral college—the national assembly and the two provincial assemblies—to choose the president. On March 23 the republic of Pakistan was proclaimed with full ceremony.

Neither at the centre nor in the provinces did political life run smoothly. On Jan. 19 the new interim provincial assembly of West Pakistan was chosen by indirect election. Differences arose between the Moslem majority and the chief minister, Khan Sahib, who in April formed a new party, the Republican party, which steadily drew strength from independents and from dissident Moslem leaguers until it commanded a majority in the provincial assembly. Khan Sahib continued to enjoy the support of the prime minister Mohammed Ali, and the central government. The Moslem league, having lost power in West Pakistan as well as in East Pakistan, became increasingly critical of the prime minister. It continued to lose membership to the Republicans, who, with the United Front, came to form a majority in the assembly, and supported the prime minister. Mohammed Ali, however, resigned both from the cabinet and the government on Sept. 8; and on Sept. 12 an Awami league-Republican coalition

under H. S. Suhrawardy, until then the leader of the opposition, took office.

In East Pakistan, A. H. Sarkar's United Front government became increasingly unpopular. In March Fazlul Huq left the federal ministry of the interior to become governor. The opposition parties—Awami league, United Progressives, Ganatantra Dal, Congress—closed their ranks and demanded a meeting of the assembly, which had stood prorogued since June 1955. When it met on May 22, 1956, the speaker adjourned the house sine die on the ground that insufficient time remained for discussion. On May 26 the president suspended the constitution but on June 1 the Sarkar ministry resumed office. Distribution of food was taken over by the military. Complaints continued and on Aug. 30 the Sarkar ministry resigned and the president again suspended the constitution. A new coalition ministry under Aftab Rahman (Awami league) took office on Sept. 6. The legislative assembly met, and the budget was passed.

There were no marked changes in Pakistan's external alignments. In March a meeting of the Southeast Asia Treaty organization council in Karachi supported Pakistan's position in the "Pakhtunistan" dispute with Afghanistan and affirmed the need for an early settlement of the Kashmir question, thereby showing its opposition to the statements made by the Soviet leaders N. A. Bulganin and N. S. Khrushchev in the course of their Indo-Afghan tour (Nov.-Dec. 1955). The prime minister attended in April a ministerial meeting of the Baghdad pact powers, and in June-July attended the conference of commonwealth prime ministers in London. There agreement was reached on Pakistan's continued membership in the commonwealth. Mohammed Ali Jinnah had amicable talks with the prime minister of India, Jawaharlal Nehru, over Kashmir but maintained his objections to the proposal put forward by India in March that Kashmir should be partitioned on the basis of the cease-fire line. No further progress was made toward a settlement, and Pakistan decided to refer the question again to the Security council. On Oct. 10, however, the Kashmir constituent assembly, having reaffirmed the accession of Kashmir to India, passed legislation to establish a constitution, and on Nov. 1 when the States Reorganization act came into force in India "Jammu and Kashmir" was incorporated into India as one of its 14 states. The validity of this legislation and this act of incorporation was not recognized by Pakistan and on Nov. 17 Suhrawardy issued a statement to the effect that Kashmir's future must be settled by a free and impartial plebiscite in accordance with resolutions of the UN Security council which had still to be implemented.

Pakistan took a prominent part in the London conference on the Suez canal dispute (Aug. 16-23). H. H. Chowdhury, Pakistan's foreign minister and delegate to the conference, speaking also on behalf of Iran, Turkey and Ethiopia, proposed certain amendments to the U.S. plan for a settlement which were accepted by the majority of delegates and enabled the plan to go forward with the support of 18 out of 22 nations represented at the conference. After the Franco-British attack on Egypt, however, there were hostile demonstrations in Karachi and Pakistan voted with the majority of nations in the UN general assembly calling for a cease fire and the withdrawal of Israeli, British and French forces from Egyptian territory.

Pakistan's economic position was adversely affected by purchases of food abroad; for although the bulk of these purchases were made under foreign aid, the surplus of Rs. 170,000,000 on the balance of payments announced by the State bank up to June 30 was reduced before the end of the year by about the amount of the surplus accumulated during the first six months. The level of commercial and industrial imports was little affected. Total trade (Rs. 2,848,000,000) continued the previous year's steady rise. Revenue estimates for 1956-57 stood at Rs. 1,304,-

500,000 as against estimated expenditure of Rs. 1,304,400,000. A comprehensive five-year development plan for 1955-60 was outlined by the Planning board in May.

(See also INDIA.)

(L. F. R. W.)

Education.—Schools (1954): primary 42,474, pupils 3,969,879, teachers (1951) 88,697; secondary 5,315, pupils 1,188,490, teachers (1952) 43,823; vocational 242. Teacher training colleges (1952) 136, students (1952) 6,930. Universities 6, students 57,509; other institutions of higher education 169. Adult education centres 881.

Finance and Banking.—Monetary unit: Pakistan rupee, with exchange rates of 4.730 (buying) and 4.782 (selling) to the U.S. dollar in March 1956. Budget: (1955-56 revised est.) revenue Rs. 1,277,000,000, ordinary expenditure Rs. 1,276,000,000; (1956-57 est.) revenue Rs. 1,310,000,000, expenditure Rs. 1,304,000,000. Currency circulation: (Jan. 1955) Rs. 2,626,000,000, (Jan. 1956) Rs. 3,088,000,000. Deposit money: (Jan. 1955) Rs. 1,224,000,000, (Jan. 1956) Rs. 1,554,000,000. Gold and foreign exchange, official holdings: (March 1955) U.S. \$326,000,000, (March 1956) U.S. \$385,000,000.

Foreign Trade.—(1955) Imports Rs. 1,085,000,000; exports Rs. 1,505,000,000. Main sources of imports: U.K. 24%; India 3%; other sterling area 9%; continental E.P.U. (European Payments union countries) 19%; Japan 14%; U.S. and Canada 12%. Main destinations of exports: U.K. 15%; India 13%; other sterling area 11%; continental E.P.U. 26%; Japan 12%; U.S. and Canada 8%. Main exports: cotton 27%; jute 45%.

Transport and Communications.—Roads (1953): 114,600 km. Motor vehicles in use (1953): passenger 32,400, commercial 19,000. Railways (1955): 11,300 km.; traffic (April 1954-55): passenger-km. 9,070,000,000; freight, ton-km. 5,330,010,000. Shipping (July 1955): merchant vessels of 100 gross tons and over 48, total tonnage 152,125. Air transport (1955): passenger-km. 111,540,000; freight, ton-km. 2,556,000. Telephones (Jan. 1955) 35,006. Licensed radio receivers (1954) 99,000.

Agriculture.—Production (metric tons, 1955; 1954 in parentheses): rice 12,247,000 (12,810,000); wheat 3,223,000 (3,742,000); barley 143,000 (158,000); maize 341,000 (447,000); tobacco 90,700 (92,500); jute 1,015,000 (846,000); cotton, lint 282,000 (284,000); cottonseed 594,000 (568,000); tea 24,600 (25,300); chick-peas 642,000 (655,000); sugar, raw value 112,000 (98,000); linseed (1954) 14,000, (1953) 12,000; rapeseed (1954) 329,000, (1953) 276,000; sesame (1954) 37,000, (1953) 37,000. Livestock (Sept. 1952): cattle 24,069,000; sheep 6,570,000; horses 494,000; mules 41,000; asses 959,000; buffaloes 4,980,000.

Industry.—Fuel and power (1955): coal and lignite 531,600 metric tons; electricity (excluding industrial generation) 610,800,000 kw.hr.; natural gas (1953) 43,600,000 cu.m. Production (metric tons, 1955): crude oil 276,000; cement 600,000; woven cotton fabrics 414,480,000 m.; chrome ore (metal content, 1954) 11,000 metric tons.

ENCYCLOPEDIA BRITANNICA FILMS.—*India* (Pakistan and the Union of India) (1952); *Pakistan* (1955).

Palaeontology. **Vertebrate.**—As in past years, vertebrate palaeontologists concerned themselves in 1956 with the problem of vertebrate origins. Comparison of the microstructure of the plates of carpid echinoderms and agnathan fish by K. E. Caster and T. H. Eaton, Jr., strengthened the position of the echinoderms as the putative ancestors of the vertebrates. A survey of the stratigraphy and faunas of early Palaeozoic North American and European localities from which primitive fish were known convinced A. S. Romer that vertebrates arose in fresh water, whereas essentially the same evidence led R. H. Denison to believe that the earliest vertebrates inhabited salt water.

The year 1956 was marked by the appearance of a new edition of *A Classification of Fishes Both Recent and Fossil* by L. S. Berg. Berg was honoured by a memorial volume including a biography of Berg and other papers, noteworthy among which was a study of the microstructure of the scales and armour of Silurian and Devonian vertebrates by A. P. Bistrov. W. M. Lehmann reported a primitive lungfish from the lower Devonian of Germany, among the oldest-known occurrences of fossil dipnoans. D. H. Dunkle and B. Schaeffer described a new palaeoniscoid fish from the Upper Palaeozoic of Brazil, and B. Accordi described a new semionotid holostean from the Lower Triassic of the Dolomite Alps, Italy. B. Schaeffer illustrated mosaic evolution (De Beer, 1954) in subholostean fishes. The description and palaeoecology of the Tertiary anacanthin fishes of the North American west coast were the subject of a study by L. R. David. The synchronicity of development of Tertiary piscifunas of Europe and the North American coastal plain was verified by E. I. White's studies of the Eocene fishes of Alabama.

A. S. Romer surveyed the progress during the past half-century in understanding of the fish-to-tetrapod transition. F. R. F. von Huene devoted a work of approximately 700 pages to the palae-

ontology and phylogeny of the lower tetrapods. The lineage of the Permian brachyopid labyrinthodont amphibians was traced by D. M. S. Watson. Field parties from Harvard university discovered amphibians preserved in fossil tree trunks from new Carboniferous horizons in Nova Scotia. E. H. Colbert and J. Imbrie revised the taxonomy of the Upper Triassic metoposaurid labyrinthodonts, basing their conclusions upon statistical analyses and upon analogies to the ranges of living amphibians. The Permian archegosaurid and intasuchid amphibians of the U.S.S.R. were studied by E. D. Konzhukova. I. A. Efremov and B. P. Viushkov compiled a catalogue of localities for Permian and Triassic tetrapods of the U.S.S.R. R. G. Zweifel described two new Tertiary pelobatid frogs from the western United States. W. Auffenberg discussed the Miocene frogs of Florida and C. J. Goin and Auffenberg the fossil sirenid salamanders.

D. M. S. Watson and A. S. Romer classified the 688 species of therapsid reptiles described from the Permian Karroo beds of South Africa, pointing out the need for detailed stratigraphic study of the source beds prior to the description of new forms. A. S. Brink scrutinized the osteology of the therapsid *Diademodon*, with particular attention to structures which might suggest a mammalian type of birth, homeostasis and tooth succession. E. A. Maleev reported upon carnivorous dinosaurs and ankylosaurs from Mongolia, and C. C. Young upon a new sauropod from the Upper Jurassic of Szechwan, China. E. E. Williams described from the late Tertiary of Peru the first American fossil pelomedusid turtle showing close relationship to a living form. M. Hecht reported a new xantusiid lizard from the Eocene of Wyoming. E. Trost examined the position of the parietal foramen among living reptiles and in the labyrinthodonts. T. Edinger demonstrated that, contrary to previous opinion, the size of the parietal foramen in reptiles can reflect the size of the parietal organ. A milestone in the study of osteology was the completion of *Osteology of the Reptiles* by A. S. Romer. This abundantly illustrated volume of approximately 700 pages is composed of two major parts, a discussion of the skeleton in fossil and living reptiles and a classification of the reptiles based on their osteology.

A valuable aid to research was the new check list of fossil birds of North America by A. Wetmore. P. Brodkorb increased the knowledge of the fossil avifauna of Florida with descriptions of two new Miocene forms, a study of the Bone valley avifauna and numerous Pleistocene records.

C. C. D. Shute analyzed components of the auditory region in reptiles and mammals, with special regard to the evolution of these structures in the mammalia. J. T. Woods reported new remains of the unique extinct marsupial *Thylacoleo*, concluding that the animal was carnivorous. Study of Oligocene material from Wyoming led J. Hough to revive the insectivorous family Apternodontidae. Study of fossils of the same age from South Dakota and other material prompted P. M. Butler to revise the major classification of the insectivora. W. Le G. Clark recorded a near-perfect skull of a loriform lemuroid from the Miocene of East Africa, and contributed a volume summarizing the fossil evidence for human evolution.

The machairodontine felids of Transvaal, Union of South Africa, were studied by R. F. Ewer and the carnivores of Hopefield, Cape Province, by Ewer and R. Singer. S. J. Olsen revised the taxonomy of the caninae of the Miocene Thomas Farm locality, Florida. The value of quantitative techniques in modern taxonomy was exemplified by B. Kurten's treatment of the Quaternary Hyaenidae. M. Crusafont-Pairo and J. Truyols-Santonja illustrated a new biometric technique, masterometry, by an application to evolution in the fissiped carnivores. T. Downs described two new sea lions from the Miocene of California.

J. Kulczycki presented an osteological study of the mammoth based upon collections from the Soviet-Polish border. Excellent skulls and partial skeletons of Miocene and Pleistocene tubulidentates from East Africa were described by D. G. MacInnes.

D. B. Kitts revised the species of the Eocene horse *Hyracotherium* and presented the first detailed study of its postcranial skeleton. The taxonomy of the horses of the Thomas Farm Miocene of Florida was elucidated by the quantitative study of large samples by R. S. Bader. The Oligocene and Miocene anthracotheres of North America were reviewed by J. R. MacDonald. C. B. Schultz and C. H. Falkenbach contributed a seventh volume to their extensive revision of the Merycoidodontidae. C. C. Black and A. E. Wood illustrated the variation and replacement of teeth in a Miocene mylagaulid. C. de P. Couto summarized the studies of late Cenozoic mammals in northwestern Brazil. Notable among the dozen or more basic studies of Tertiary mammalian faunas was that of the Mascall Miocene of Oregon by T. Downs.

The report by P. H. Abelson of amino acids in vertebrate fossils up to 300,000,000 years old indicated the continued development of the new science of palaeobiochemistry, a promising tool for the vertebrate palaeontologist.

(CN. R.)

Palaeobotany.—Of particular interest to anyone concerned with the past history of the world's vegetation was the discovery of a palmlike plant from rocks of Triassic age in southwestern Colorado. Described under the name *Sanmiguelia lewisi* (named for the San Miguel river at the type locality, and G. Edward Lewis of the U.S. geological survey, the discoverer) the specimens consisted of characteristically pleated palmlike leaves up to 15 in. long. Several leaves were found attached, at intervals of about 1½ in., to what is thought to have been the terminal portion of a low-growing plant. The Middle to Upper Triassic age of *Sanmiguelia* constitutes a record that is 10,000,000-20,000,000 years earlier than that for any previously described fossil flowering plant. Authentic records of flowering plants from the overlying Jurassic period are in fact quite rare, and it was not until Cretaceous times that the group became abundant. In view of the general supposition that the palms were an advanced rather than a primitive family, this discovery suggested that the flowering plants originated at a much earlier date than had formerly been supposed. (Roland Brown, 1956.)

Another especially significant contribution was Alfred Traverse's (1955) study of the fossil pollens found in the Brandon lignite of Vermont. This was a small deposit of poor-grade coal that had interested geologists and palaeontologists for more than a century, partly because of its rarity in that area and because of the abundance of fossil plant remains which compose the lignite. The Brandon deposit was reopened and rather extensive collections of fossil plants were obtained, under the direction of Elso S. Barghoorn of Harvard university, during the summers of 1947 and 1948. The fossils included abundant fruits, seeds, wood and pollens, and the report by Traverse dealt comprehensively with the latter material. The 76 different pollens and spores found included several algae and ferns, a pine and *Glyptostrobus*, a modern Chinese conifer which occupies a habitat similar to that of the southern bald cypress. A significant number of the Brandon fossils appeared to be closely related to modern plants found in southeastern United States. These included the water elm (*Planera*); southern leatherwood (*Cyrilla*), a genus not found north of southeastern Virginia at the present time; loblolly bay (*Gordonia*), a genus that is now distributed through the tropics and subtropics of southeastern Asia and in southeastern North America; and the tupelo (*Nyssa*), found today as far north as New England but principally warm temperate. Also included in the Brandon flora were plants belonging to the walnut, oak, elm, mulberry, sweetgum, holly, grape, linden,

heath, tea and sapidilla families. This abundant and interesting flora thus suggested an appreciably warmer climate for the central Vermont area during Upper Oligocene times; it may be dated approximately 25,000,000 years old.

Numerous other studies appeared during 1956 which dealt with fossil spores, pollens and other microscopic organisms. One of the most noteworthy was a comprehensive account of the fossil microplankton, found in the southern hemisphere, by Georges Deflandre and Isabel Cookson (1955). (The plankton include free-swimming and floating marine plants and animals; some of these, such as the diatoms, occur in fabulous quantities and constitute the ultimate source of food for most of the larger forms of marine life.) The Deflandre-Cookson report described many new forms of dinoflagellates (a unique group of unicellular algae) and numerous hystrichosphaerids, a highly problematical assemblage of microorganisms known from as far back as Pre-Cambrian times.

The study of a wide variety of fossil microorganisms is a major phase of both theoretical and applied palaeontology. Indeed, so many workers are engaged in this field that a new periodical, *Micropaleontology*, was inaugurated in 1955, published under the auspices of the department of micropaleontology of the American Museum of Natural History in New York City. A 1956 issue contained a comprehensive article by Leonard Wilson which was of particular interest to anyone wishing to gain some knowledge of the over-all aspects of this young and rapidly expanding science. His account included a two-page chart listing the various kinds of microfossils with brief descriptions, their geologic range and the habitats they occupied in life.

A new genus of conifers, *Parataxodium*, was described from northern Alaska. It is thought that this represents a line of plants that stems from *Sequoia* stock, having split off in Cretaceous times and became established in the far north in contrast with the mid-latitudes region that *Sequoia* itself has seemingly always favoured. It is also possible that *Metasequoia*, the dawn redwood of west central China, and *Taxodium*, the bald cypress of subtropical North America, were derived from *Parataxodium* in Cretaceous and Tertiary times respectively.

Several contributions appeared which expand the knowledge of Coal Age (*Carboniferous*) floras. One of the most noteworthy was a comprehensive review of the medullosas, a distinctive group of seed ferns that constituted an important element in the Upper Carboniferous forests of North America and Europe and believed to be the ancestral line from which the modern cycads originated. The medullosas were vinelike plants or trees, some of which attained a trunk diameter of a foot or more, bore fern-like foliage, seeds and curious bell-shaped organs in which the pollen was contained. (Wilson Stewart and Theodore Delevoryas, 1956.)

(See also BOTANY.)

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ENCYCLOPEDIA BRITANNICA FILMS.—*The Strands Grow* (Part I, Web of Life series) (1953).

Palestine: see ISRAEL; JORDAN; UNITED NATIONS.

Panamá. A republic on the isthmus joining the continents of North and South America, Panamá is bounded on the north by Costa Rica and on the south by Colombia, and is bisected by the Panama Canal Zone, which is leased to the United States. Area: 28,753 sq.mi.; pop.: (1950 census) 805,285,



PRESIDENTS OF AMERICAN NATIONS listening to invocation by the archbishop of Panamá before meeting to sign the Declaration of Panamá on July 22, 1956. U.S. President Eisenhower is third from left

(1956 official est.) 934,000, both exclusive of the Canal Zone. The capital is Panamá city (pop., 1950 census) 127,874; other principal cities are Colón 52,204; David 14,847; La Chorrera 8,652; Puerto Armuelles 5,734; and Santiago 5,886. Language: Spanish. Religion: predominantly Roman Catholic. Presidents in 1956: Ricardo Arias Espinosa until Oct. 1; thereafter Ernesto de la Guardia, Jr.

History.—Ernesto de la Guardia, Jr., was inaugurated president on Oct. 1, 1956, bringing to a close the interim period which began on Jan. 2, 1955, with the assassination of Pres. José Remón. Remón's second vice-president, Ricardo Arias Espinosa, had served as president during most of this time after Remón's first vice-president, José Ramón Guizado, was imprisoned for complicity in Remón's murder. Many aspects of this crime remained unexplained, and although Rubén Miró, alleged principal in the case, remained in custody, he had never been brought to trial.

The principal event of 1956 during the Arias administration was the special session of the Organization of American States from July 18 to 22 in Panamá city to celebrate the 130th anniversary of the first Pan American conference called by Simón Bolívar in Panamá city in 1826. Presidents or presidents-elect of 19 American republics attended, only Honduras and Colombia being unrepresented. The importance of the attendance of U.S. Pres. Dwight D. Eisenhower was emphasized by the postponement of the meeting for one month when he suffered a serious illness in June. The ideals of hemispheric solidarity were reaffirmed when delegates signed the Declaration of Panamá, reiterating joint support of freedom, antitotalitarianism and peace. The full extent of U.S. participation was interpreted as an answer to critics who deplored the deterioration of the "good neighbour" policy.

Panamá protested in August when it was not invited to send a representative to the London meetings which were called to work out a solution to the Suez canal problem. Panamá was interested on two counts: because of the responsibility which its own isthmian strategic location imposed upon it, and because it is the country of registration, although not of ownership, of one of the largest merchant fleets in the world. The question of Panamá's sovereignty over the Canal Zone also arose, but when it was elucidated only minor differences of interpretation remained.

The former dictator of Argentina Juan Perón, who arrived in Panamá in Nov. 1955, was the centre of much attention until he moved on to Venezuela in August.

At the end of September, the unicameral national assembly moved into its new glass, concrete and steel building designed by Ernesto de la Guardia III, son of the new president, whose inauguration a few days later was the first official function to be celebrated within the new building. President de la Guardia controlled the national assembly through the 42 members of his *Coalición Patriótica Nacional*. The defeated candidate Víctor F. Goytia maintained an active opposition, however, although his Liberal party adherents held only 12 seats.

Several new projects to hasten the country's economic development were planned during 1956. As work continued on the section of the Pan American highway to join Panamá and Costa Rica, a survey team made the first difficult traverse along the route of the proposed inter-American highway between Chepo, Pan., and Turbo, Colom. The Panamá Refining company signed a contract in May to start a large refinery, and Petroquímica de Panamá was installing a plant to produce synthetic rubber and plastics. The discovery of a good oil-producing area in Costa Rica adjacent to the Panamá province of Chiriquí, and the threat to world oil supplies posed by the Suez crisis, spurred extraordinary oil exploration, especially in Chiriquí and Bocas del Toro provinces. The two most active companies were Union Oil company of California and Cataract Mining corporation of New York. Sears, Roebuck opened a store in Colón in March, and the free trade zone there was beginning to attract enterprises in both manufacturing and distribution. (R. HN.)

Education.—In the school year 1954-55 there were 1,081 public and private primary schools with 132,743 pupils enrolled, and 90 post-primary schools with 23,783 students. The national university had 2,152 students. The 1950 census showed that 28.3% of the population over ten years of age, excluding tribal Indians, was illiterate. About 21% of the 1956 budget was earmarked for education.

Finance.—The monetary unit is the balboa, at par with the U.S. dollar. The national budget for 1956 balanced ordinary revenue and expenditure at \$47,594,761 and extraordinary revenue and expenditure at \$10,948,400. Total revenue in 1955 was \$48,386,184; expenditure, \$53,877,000 (including unpaid commitments of \$5,490,815). The national debt on Dec. 31, 1955, totalled \$43,270,900, of which \$10,857,500 was external. Demand deposits totalled \$35,300,000 on June 30, 1956. The U.S. department of commerce estimated U.S. direct private investments in 1955 at \$479,000,000, over 50% of which represented investments in oil tankers registered under the Panaman flag. The cost-of-living index (Panamá city) stood at 99 in June 1956 (1953=100).

Trade and Communications.—Domestic exports in 1955 totalled \$19,281,795; re-exports, \$2,397,128; imports, \$75,684,653. The leading customers were the U.S. (94%), Colombia (2%) and Puerto Rico and the U.S. Virgin Islands (1%); leading suppliers, the U.S. (60%), the Canal Zone (10%), Colón free trade zone (5%), the U.K. (4%) and Germany (4%). Chief exports were bananas (64%), fresh shrimp (14%), cacao (5%), coffee (4%) and abacá (4%). The traditionally adverse balance of trade is generally offset by invisible exports to the Canal Zone in the form of tourist expenditures, sales to ships and wages of Panamanians employed there.

Railway mileage is 220. Highways in 1955 totalled 1,350 mi., of which 440 mi. were paved. Motor vehicles totalled 19,425 on Dec. 31, 1955. According to *Lloyd's Register of Shipping*, 555 vessels (100 tons and over) aggregating 3,922,529 gross tons were registered under the Panaman flag on June 30, 1955. Telephones (Jan. 1, 1955) numbered 18,237, of which 77.9% were automatic.

Agriculture.—Exports of bananas in 1955 totalled 7,017,842 stems, all of which went to the U.S. Exports of other export crops included cacao 1,401 metric tons; abacá 1,770 tons; coconuts 5,795,800 nuts. Production of rice in the 1955-56 season was about 215,600,000 lb.; sugar 33,000,000 lb. In June 1955 there were an estimated 578,200 cattle and 214,600 pigs. In 1955, 1,920 metric tons of fresh shrimp and 5,080,000 sq.ft. of timber and lumber were exported.

Manufactures.—Installed electric energy capacity (Panamá city and Colón) totalled 35,000 kw. on Dec. 31, 1955; production was 113,712,000 kw.hr. in 1955. Production of manufactured gas (Panamá city and Colón) was 691,294,000 cu.ft.; rum 659,958 l.; beer 14,850,276 l.

(J. W. Mw.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Central America* (1944); *Panama* (1955).

Panama Canal Zone.

A United States military reservation embracing a 10-mi. strip across the Isthmus of Panamá, leased for the protection and administration of the Panama canal, the Panama Canal Zone has an area of 553 sq.mi., including 191 sq.mi. of fresh water. Population: (1950 census, inclusive of uniformed military personnel) 52,822; (1954 est.) 58,000. The largest city is Silver City, which in 1950 had 5,726 inhabitants. La Boca (4,235), Balboa (4,162) and North Gamboa (3,074) were next largest. Adminis-

trative centre: Balboa Heights (pop., 1950, 363). Governors in 1956: Maj. Gen. John S. Seybold (until May) and Brig. Gen. William E. Potter.

History.—During the first six months of the fiscal year ending June 30, 1956, the number of vessels using the canal increased to 4,083 as compared with 3,947 during the same period in fiscal 1955. According to the retiring governor, Maj. Gen. John S. Seybold, who was replaced by Brig. Gen. William E. Potter in May 1956, the lock-operated canal was approaching capacity, and he urged its replacement by a sea-level canal.

Problems arose during 1956 in making operative certain clauses of the 1955 treaty governing relations between the United States and Panamá concerning the Canal Zone. On Jan. 1, 1957, the provision excluding Panamanian employees from trading at Canal Zone commissaries would go into effect. This stipulation, which was sponsored by the Panamá business community, would affect about 15,000 employees and would give Panamá merchants an additional \$12,000,000 to \$15,000,000 in retail trade annually, but employees would be forced to pay Panamá prices which were appreciably higher. Panamanian officials claimed that while the treaty was being negotiated, they understood that the Panama Canal company would make an increase in pay to offset the higher prices. This was denied by the company, and the upshot was a strong movement by workers for renegotiation of the treaty.

Congress also considered several other Canal Zone measures not related to the treaty. A bill was enacted to exclude the Canal Zone from the \$1.00 per hour U.S. minimum wage law which had threatened to upset local wage patterns. Another important matter, likely to become law, would transfer the Canal Zone from the jurisdiction of the U.S. army department to that of the commerce department. This was part of a long campaign on the part of shipping companies to reduce tolls which they asserted were having to sustain an undue proportion of military costs besides losses in the operation of a steamship line, a railroad, two hotels and ship repair facilities.

Steamship companies continued their suit to recover \$27,000,000 in tolls which they alleged the Panama Canal company had collected illegally since 1951. Although the suit was dismissed in the federal district court in New York city on June 29, 1956, it was appealed to the U.S. appellate court. (R. HN.)

Education.—In the fiscal year ending June 30, 1955, there were for U.S. children 10 kindergartens, 15 elementary and secondary schools and a junior college with enrolment on Oct. 15, 1954, of 6,629. For Latin-American children there were 4 kindergartens, 11 elementary and secondary schools and a junior college with enrolment of 4,044.

Canal Traffic.—During the fiscal year ending June 30, 1955, 7,997 commercial vessels (300 net tons and over), aggregating 38,567,769 canal net tons, and 296 U.S. government vessels passed through the canal. The commercial vessels carried cargo aggregating 40,646,301 long tons and paid tolls totalling \$33,849,477. Of the cargo carried, 22,227,295 tons were from Pacific to Atlantic and 18,419,006 tons were from Atlantic to Pacific. Major commodities in the Pacific-Atlantic traffic were ores 4,089,474 tons, lumber 3,747,151 tons and mineral oils 1,981,242 tons; in the Atlantic-Pacific traffic, mineral oils 4,305,771 tons, coal and coke 3,274,001 tons and iron and steel manufactures 1,792,150 tons. Of the 7,997 commercial vessels passing through the canal, 2,102 were U.S., 1,145 British, 904 Norwegian, 551 Panaman, 464 Japanese, 428 Honduran, 384 Liberian, 375 German, 323 Danish and 207 Swedish; the remaining 1,114 were of 25 other nationalities. According to preliminary figures, 8,209 commercial vessels, aggregating 40,646,000 canal net tons, and 266 U.S. government vessels passed through the canal in the fiscal year ending June 30, 1956. (J. W. Mw.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Central America* (1944); *Panama* (1955).

Pan American Union: see ORGANIZATION OF AMERICAN STATES.

Paper and Pulp Industry.

The production of paper and paperboard in the United States in the first half of 1956 was estimated at 16,071,000 short tons, an increase of 1,342,000 tons over the same period in 1955. Estimated production for the entire year 1956 was between 31,000,000 and 32,000,000 tons. Paper consumption in 1955 amounted to 34,526,000 tons, and during that year 5,500,000 tons

Table I.—U.S. Production and Consumption of Paper, Wood Pulp and Pulpwood

Year	Paper and Paperboard (short tons)		Wood Pulp (short tons)		Receipts of Pulpwood (cords)		
	Production	Consumption	Production	Consumption	Domestic	Imported	Total
1925	9,182,204	10,590,090	3,962,217	5,590,304	5,005,445	1,088,376	6,093,821
1931	9,381,840	11,403,850	4,409,344	6,005,713	5,896,446	826,320	6,722,766
1935	10,506,195	12,490,886	5,032,299	6,877,869	6,590,942	1,037,332	7,628,274
1940	14,483,709	16,620,632	8,959,559	9,781,739	12,307,138	1,435,820	13,742,958
1945	17,370,965	19,665,487	10,167,140	10,825,412	15,245,000	1,729,000	16,974,000
1950	24,377,222	29,013,060	14,827,152	16,483,201	20,702,000	1,834,000	22,536,000
1955	29,896,748	34,526,162	20,827,562	20,659,000	30,894,000	1,928,000	32,822,000

total consumption of wood pulp increased from 1,834,000 tons in 1954 to slightly more than 2,000,000 tons in 1955. The supply and demand situation relative to newsprint was expected to be out of balance until 1958-59. (R. G. M.)

were imported and 845,000 tons were exported. The prediction for paperboard production in 1956 was 14,900,000 tons.

The per capita consumption of paper reached a high of 418 lb. at the end of 1955. Thirty new paper machines were scheduled to come into production in 1956, which would add about 1,700,000 tons to the annual capacity. Pulpwood consumption was expected to amount to 36,160,851 cords in 1956, while wood pulp

ENCYCLOPÆDIA BRITANNICA FILMS.—*Paper* (1946).

Papua-New Guinea. The territory of Papua and the trust territory of New Guinea, occupying the southeast and northeast quarters respectively of the island of New Guinea, are administered with dependent islands as one area by Australia. Areas and populations are:

Table II.—U.S. Paper Production

Grade	(In short tons)			
	1940	1945	1950	1955
Newsprint	1,056,304	725,475	1,013,346	1,458,373
Book and groundwood	2,205,876	2,137,041	3,302,861	3,870,929
Fine	735,753	1,000,794	1,198,547	1,453,843
Wrapping (coarse)	2,500,818	2,403,182	3,285,635	3,715,783
Tissue and sanitary	733,894	980,788	1,373,550	1,685,220
Building papers	682,460	883,259	1,424,633	1,519,662
Other paper	189,530	326,690	467,593	642,348
Container board	3,434,834	4,131,107	5,646,433	7,550,000
Folding boxboard	1,416,452	2,092,344	2,368,010	2,644,000
Setup boxboard	898,549	721,087	641,345	781,000
Building boards	179,443	894,830	1,258,620	1,650,000
Other boards	449,796	1,074,368	2,396,649	2,926,000
Total	14,483,709	17,370,965	24,377,222	29,897,158

Table III.—U.S. Wood Pulp Production

Year	(In short tons)					Total
	Unbleached Sulphite	Bleached Sulphite	Total Sulphate	Groundwood	Soda	
1935	634,947	944,620	1,467,749	1,355,819	485,162	5,032,299
1940	995,700	1,612,089	3,747,992	1,632,727	532,387	8,959,559
1945	815,909	1,543,762	4,471,875	2,386,859	429,757	10,167,140
1948	901,814	1,909,402	6,013,696	2,175,107	509,864	12,872,292
1950	744,493	2,111,332	7,508,376	2,220,795	522,990	14,827,152
1953	593,958	1,728,648	9,444,816	2,342,929	427,546	17,537,295
1955	643,826	1,909,006	10,921,909	2,704,455	440,454	19,471,650

capacity was expected to reach 20,197,000 tons during the year.

Canada.—The production of paper in Canada in 1955 was about 7,200,000 tons, of which 6,190,647 tons were newsprint. Pulpwood consumption was 12,500,000 cords, compared with 12,475,600 cords in 1954. In 1955, 5,070,211 tons of newsprint were exported to the United States and 734,902 tons to overseas countries. Per capita consumption of paper was 280 lb. There were 96 paper mills and 34 wood pulp mills in 1956, and 80% of the paper production was being exported.

Table IV.—Canadian Paper and Paperboard Production

Kind	(In short tons)			
	1950	1952	1954	1955
Newsprint	5,318,988	5,687,051	5,984,207	6,190,647
Book and fine paper	214,097	253,000	294,197	321,041
Wrapping	222,840	224,000	246,197	258,390
Paperboard	876,894	684,000	738,248	788,236
Other papers	179,216	272,000	378,798	400,292
Total	6,812,035	7,120,051	7,641,647	7,211,131

Table V.—Canadian Wood Pulp Production

Year	(In short tons)					Total
	Bleached Sulphite	Unbleached Sulphite	Sulphate	All Others	Groundwood	
1935	374,157	644,820	236,536	20,887	2,563,711	3,840,111
1940	543,987	936,558	371,569	133,164	3,305,484	5,290,762
1945	603,929	1,035,755	478,740	140,470	3,341,920	5,600,814
1950	760,769	1,450,104	1,053,588	297,750	4,910,803	8,473,014
1955	1,057,483	1,738,413	1,440,384	201,972	5,429,162	9,867,414

United Kingdom.—The production of paper and paperboard in 1955 amounted to 3,646,960 long tons. There were 1,416,860 tons imported and 334,600 tons exported. The per capita consumption for the year was 187 lb. Production of esparto papers increased from 268,705 tons in 1954 to 282,871 tons in 1955. The

Territory	Area (sq.mi.)	Population (1954 census)	
		Native	Non-native*
Papua†	90,540	488,396	6,313
New Guinea‡	70,050	1,035,283	11,442
Islands included in trust territory|| . . . . .	23,000	171,466	
Total	183,590	1,695,145	17,755

*About 76% European, 13% Asian, 11% other races. †Including d'Entrecasteaux, Louisiade, and Trobriand (with Woodlark) Islands (total area 2,754 sq.mi.). ‡Including adjacent minor islands. §Bismarck archipelago (including New Britain 14,150 sq.mi., New Ireland 3,340 sq.mi., New Hanover 460 sq.mi., Admiralty Islands 800 sq.mi.) and some of Solomon Islands (including Bougainville 4,080 sq.mi.).

Native population, Papuan and (especially in Bismarcks, Solomons and coastal New Guinea) Melanesian; Negrito and Micronesian minorities. Religion: pagan with Christian minorities. Capital of joint administration, Port Moresby (pop. about 13,800). Administrator in 1956, Brig. D. M. Cleland.

History.—As a result of intensified patrolling during the past six years the administration had reached all parts of Papua and New Guinea. Only a little more than 25,000 sq.mi. of the country remained outside full administrative control and it was expected that the whole of the territory would be under control by the end of 1959. The political development of the indigenous people was being fostered through the system of local government councils.

Progress in the economy of the territory was reflected in the increasing volume and value of the production and exports of local products. Timber production was greatly increased, more than 55,000,000 super feet of logs being produced in 1955-56 (in 1954 a modern plywood factory with an annual capacity of 48,000,000 sq.ft. of plywood had been opened at Bulolo). Cocoa and coffee planting and production also was increasing. The internal revenue of the territory is supplemented by an annual grant from the Australian government (£8,443,823 for 1955-56).

(R. R. My.)

Education.—(1954) *Papua*: Administration schools 33, pupils 1,875; mission schools 817, pupils 43,261. *New Guinea*: Administration schools 79, pupils 4,495; mission schools 2,773, pupils 88,492.

Production.—*Papua* (metric tons): rubber (exports, 1955) 3,700, (1954) 3,500; copra and coconut oil (exports, copra equivalent, 1954) 11,700; copra (1953) 8,800; coconut oil (1955) 6,500, (1954) 7,500; sawn hardwood (1954) 20,000 cu.m. *New Guinea* (metric tons): copra (1954) 71,780, oil equivalent (June 1954-55) 10,215; cocoa beans (1954) 713; gold mined (1954) 90,857 oz.; sawn hardwood (1954) 123,000 cu.m.

Finance and Trade.—Monetary unit: Australian pound used throughout Papua-New Guinea (£A1=U.S. \$2.20). *Papua* (1954): revenue £A3,296,593; expenditure £A3,240,309. Imports £A5,722,166; exports (including exports not of local origin) £A1,921,162, including copra £A883,814, rubber £A612,788, desiccated coconut £A27,211. Main sources of imports: Australia 73%, U.K. 7.3%, U.S. 7.3%; main destination of exports: Australia. *New Guinea*: revenue (1953-54) £A5,094,789 (Australian government grant £A3,103,076); expenditure £A5,094,789. Total imports £A9,444,628; exports (including exports not of local origin) £A9,192,110. Principal exports: copra £A5,031,676; gold £A1,409,480; coconut products £A1,503,861; cocoa beans £A245,950; shell £A170,321; timber £A93,313. Principal imports: foodstuffs £A2,701,257; machinery and metal manufactures £A2,857,755; clothing and textiles £A969,038.

Paraguay. This landlocked republic in central South America is bounded north and east by Brazil, north and west by Bolivia and south by Argentina. Area: 157,047 sq.mi., of which 95,338 sq.mi. constitutes the sparsely populated Chaco, while the 61,709 sq.mi. lying east of the Paraguay river contains

95% of the population. Pop.: (1950 census) 1,408,400; (1956 est.) 1,601,000. The people are a homogeneous amalgam of Spanish and Guaraní stock, with some Portuguese and Italian, which has developed into a racial type. Official language: Spanish. The Guaraní tongue has survived more than the blood, but is secondary and recessive. Capital and chief centre: Asunción, pop. (1950) 201,340. Other large cities (1950 census): Villarrica 14,680, Concepción 14,640, Encarnación 13,321. Official religion: Roman Catholic. President in 1956: Gen. Alfredo Stroessner, also commander of the armed forces.

History.—The termination of the Juan Perón regime in Argentina in the autumn of 1955 strongly affected Paraguay, whose economy was geared to Argentina's and whose army officers had Peronist proclivities. The powerful Central Bank hoped for a Perón restoration which would again mean trade and financial advantages. In Dec. 1955 the younger officers at Campo Grande staged a revolt. The loyalty of the senior officers enabled President Stroessner to suppress the movement, and he dealt mildly with the defectors. In Jan. 1956 he appointed a new head of the Central Bank, and called in a panel from the International Monetary fund to reform and simplify the currency and the commercial system. The results were somewhat favourable to production and many of the exports, but increased the consumer prices of imports and local products. The outlawed Liberal party, hoping that the diminution of Peronist tendencies might give a political opening, took advantage of consumer unrest to incite student riots in May. There was a minor reshuffling of the cabinet and the administration remained unchallenged during the summer.

Brazil showed increased friendliness by signing four agreements in January to release Paraguayan funds accumulated against prior Brazilian loans, to take steps for actual construction of the Paraguayan highway to south Brazil, to plan an international bridge at Iguassu and to make practical studies for joint hydroelectric development of the Upper Paraná river. The United States renewed its Foreign Operations mission and technical assistance agreements, and in April agreed to deliver \$3,000,000 of farm surplus foodstuffs, to be paid in guaraníes which in turn would be loaned to Paraguay for economic development. Trade pacts were maintained with West Germany, Italy, Hungary, Poland and Uruguay; and reciprocity with Bolivia was expanded. Paraguay approved the Pan American Postal Union agreement of 1955 as well as the convention creating the International Finance corporation.

Education.—In 1953 there were 1,794 elementary schools with 252,393 pupils, 87 secondary schools with 13,420 pupils and the national university with 2,100 pupils. Vocational and normal schools, with U.S. aid, and religious secondary schools increased strongly. The national budget in 1956 provided 127,500,000 guaraníes for education.

Finance.—The monetary unit is the guaraní, whose parity was reduced in March 1956 from 21 to 60 guaraníes per U.S. dollar. The intricate system for controlling trade by differential exchange rates was abolished, and imports and exports in general moved at parity. Control by licences was continued, and exchange reserves were built up to \$4,000,000 by midyear. The national revenues in 1955 were 862,800,000 guaraníes, and expenditures 871,100,000 guaraníes. The 1956 budget contemplated receipts at 1,159,100,000 guaraníes, and expenditures at 1,127,200,000. The internal public debt Jan. 1, 1956, was 270,700,000 guaraníes, and the external debt \$9,304,536, both showing reductions. Money in circulation June 30, 1956, was 860,000,000 guaraníes, and demand deposits 590,000,000 guaraníes. The reserves of the Central Bank were \$12,243,000 of which \$6,263,000 were in Argentine-convention dollars partly available. Bank credit Jan. 1, 1956, was 2,347,700,000 guaraníes, compared with 1,435,600,000 guaraníes a year earlier. Asunción's three foreign branch banks, Argentine, Brazilian and British, held about 8% of this credit.

Communications.—The British controlled Paraguay Central has 296 mi. of railway from Asunción to Encarnación, and in 1954 carried 2,000,000 passengers and 150,000 tons of freight. Quebracho and timber companies have 404 mi. of small railway outlets, with heavy traffic. All-weather highways total 628 mi., and seasonal or ox-cart roads have about 4,000 mi. Automobiles, trucks and buses number about 5,100. A much needed trans-Chaco road was in active construction in 1956. Bids were opened in 1956 for a hydraulic dredge to keep the upper Paraná river open longer in low water years, as traffic was light in 1955. The number of telephones was 6,500, all government-operated, with both land-line and radio-telephone circuits to Argentina. There were 3,500 mi. of telegraphs, mainly state owned, with radio telegraph connection to nearby countries. There were ten small radio stations and 40,000 radio sets.

Trade.—Exports in 1955 were valued at \$35,097,000 and imports at \$28,955,000; and the first half of 1956 showed good increases. Timber exports were down to \$13,038,000 in 1955 because of low river levels and Argentine policies. Quebracho exports were \$5,628,000, cotton \$5,499,000, meat products \$2,324,000 and oleaginous products \$1,939,000. Other exports were hides, yerba maté, essential oils and tobacco. Leading imports were breadstuffs, petroleum products, machinery, vehicles, textiles, paper, chemicals and drugs. The leading destinations of exports and sources of imports, by countries and percentages, were as shown in the table.

Countries	Per cent exports	Per cent imports	Countries	Per cent exports	Per cent imports
Argentina	45.7	43.4	Netherlands	4.1	3.5
United States	18.0	13.9	Uruguay	2.8	1.5
United Kingdom	9.5	7.0	France	2.3	4.5
Germany (West)	4.7	4.7	Belgium	1.3	0.6

Agriculture.—Cotton is the largest cash crop, and in 1955-56 fell to 10,000 tons (50,000 bales), 30% less than the previous season. Sugar production rose to 20,000 tons, making the country almost self-sufficient. Tobacco, about 9,000 tons, was superior in quality. The rice crop of 17,000 tons was normal. The other leading crops, maize, mandioca, cowpeas, yams and peanuts, were hard hit by the drought and unprecedented freezes in 1955. Cattle decreased in 1955 to about 3,500,000, but the reopening in 1956 of a large packing plant to slaughter 60,000 head gave stimulation to the industry.

Manufactures.—The industrial index, based on 1946 as 100, stood at 104 early in 1955 and showed no subsequent rise. Typical leading manufactures in 1952 or 1953 were: flour 50,000 tons, cotton 15,500,000 yd., quebracho 35,000 tons, sugar 23,000 tons, yerba maté 12,000 tons and liquors 19,080,000 l. Other important manufactures were leather, glass and ceramics, soap, essential and vegetable oils, alcohol, tobacco products, shoes, pharmaceuticals, brushes, lace and printed matter.

Mines and Forests.—Paraguay has virtually no metals, petroleum or coal. Its cement plant at Valle Mi brought capacity in 1956 to 30,000 bbl. per month, enough for current needs. Brick and tile in 1953 were 48,000,000 units, cobbles and rock 50,000 tons and lime 12,000 tons. Logs and beams exported in 1953 were 160,000 tons, and lumber output 19,000 tons, both hardwoods and semihardwoods.

(W. Fr.)

Parents and Teachers, National Congress of: see SOCIETIES AND ASSOCIATIONS, U.S.

Paris. Capital and largest city of France, Paris had a population according to the 1954 census of 2,850,189. Presidents of the municipal council in 1956: Jacques Féron and (from June 18) Pierre Ruais.

The ordinary budget for Paris, adopted on Jan. 26, 1956, amounted to 76,818,000,000 fr., and the cost-of-living index



PARIS "BREAD LINE," housewives waiting to obtain loaves of bread during a general strike by bakers in the French capital in 1956

slowly increased, as compared with that for 1955. The municipal council was preoccupied with the housing crisis which persisted in spite of new buildings. It was estimated that about 500,000 houses were needed in the Paris area. The housing situation was complicated by the fact that an annual average of 60,000 persons entered Paris, many being French persons who had left North Africa because of the troubles there. The rebuilding of the Rond-Point de la Défense began; on June 19 the first stone was laid for the Palais du Centre National des Industries et des Techniques. The reopening of the schools on Oct. 1 once more posed the grave problem of the lack of accommodations; the primary schools of Paris and the Seine *département* received 30,000 more pupils in 1956 than in 1955. In Paris 300 new classes were started, and 600 were started in the Seine area. Motor traffic continued to increase; the subway in the Place de l'Alma was opened at the beginning of October for the inauguration of the motor show. The lighting was improved, particularly in the Avenue des Champs-Élysées and the Avenue de l'Opéra.

During Jan. 29–31, 1956, ceremonies took place to link Paris and Rome. There was a corresponding linking of the Avenue de l'Opéra with the Via Frattina in Rome; during June 12–16 the public was invited to identify in the shop windows of the Avenue de l'Opéra a typical Italian object, and the winner obtained a free trip to Rome. The annual shop-window competition took place in the Rue du Faubourg St. Honoré in the fortnight beginning May 29. The theme in 1956 was "Celebrities of Paris, Past and Present." Among the figures shown were Ste. Genevieve discovering Paris in 452, Louis XIV, Madame de Sévigné, the Comte d'Orsay, the beautiful Otéro, Marcel Proust and the Fratellini clowns. Some new streets were named on Jan. 22 commemorating Gérard de Nerval, the actress Julia Bartet and the writers J. H. Rosny (the elder) and Henri Duvernois. Two historical houses were no longer endowed, the Hôtel d'Aumont in the Rue de Jouy, and, near the Avenue de l'Opéra, the Hôtel Ventadour, which had been refused funds by the minister of Finance.

ENCYCLOPÆDIA BRITANNICA FILMS.—*France* (1955); *France and Its People* (1955).

Parks and Monuments: see NATIONAL PARKS AND MONUMENTS.

Pashtunistan or Pakhtoonistan: see AFGHANISTAN; PAKISTAN.

Patents and Trade-Marks. During the fiscal year ending June 30, 1956, the United States patent office granted 43,798 patents, including 104 for designs, 88 for plants and 141 reissues. This was 11,490 more than the number issued in 1955.

Although applications for patents continued to be filed at a high rate, the total of 81,055 represented a decrease of 3,178 from the preceding fiscal year. The total number of patent applications pending on June 30, 1956, was approximately 218,000, of which about 122,000 were awaiting action by the office, the remainder being under rejection awaiting response by applicants, or in interference or appeal proceedings.

The largest number of trade-marks ever registered in a single year, 21,613, added to 3,315 renewals, established a record figure for registrations and renewals, 24,928. This was an increase of 231 over the 1955 figure. On June 30, 1956, approximately 19,778 applications for registration, renewal and republication were pending, of which 10,428, or slightly more than half, were pending before the examiners.

By June 30, 1956, the patent office had granted more than 6,750,000 patents since the consecutive numbering system began in 1836. Complete classified and numerical sets of United States

patents are available for the use of the public in the patent office search room. Information concerning the patents issued each week is contained in the *Official Gazette* of the United States patent office, which is available for reference in approximately 340 of the more than 550 government depository libraries in nearly every state of the United States. Copies of patents may be seen in 22 libraries in the country. Printed copies of patents are sold for 25 cents each, designs and trade-marks for 10 cents each.

During the 1956 fiscal year the patent office distributed more than 7,500,000 copies of United States patents and trade-marks, selling nearly 4,500,000 copies to the public, depositing about 900,000 in libraries throughout the United States and shipping more than 1,500,000 to foreign countries under exchange agreements.

The patent office developed an eight-year program for reducing the backlog of pending applications and for reducing the average time required for an application to eventuate into a patent. This program was set forth in a pamphlet, "The United States Patent Office, What It Is, How It Functions, What It Needs," published in 1955.

To further a program for retrieving technical and scientific information, the patent office established a new organization unit known as the office of research and development. This group, in collaboration with the national bureau of standards, devoted full attention to this problem pursuant to the recommendations of the Vannevar Bush committee on the Application of Machines to Patent Office Operations.

A revised edition of the trade-mark rule booklet, which had been out of print for more than a year, was issued under date of June 1956, with a new title "Trademark Rules of Practice of the U.S. Patent Office." A new edition of the "Rules of Practice of the United States Patent Office in Patent Cases" was published in Sept. 1955.

Net receipts for the fiscal year ended June 30, 1956, were the highest in history, \$6,547,469. Obligations incurred under all patent office appropriations amounted to \$14,471,723, compared with \$11,629,317 for the preceding year. (R. C. W.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Draftsmen of Dreams* (1955).

Peaches: see FRUIT.

Peanuts. The U.S. 1956 crop of picked and threshed peanuts was a small one of 1,488,575,000 lb., 5% less than the 1,564,530,000 lb. of 1955 and 18% below the 1945–54 average. A total of 1,509,000 ac. were indicated for harvest (as compared with a final official acreage allotment of 1,650,342 ac.), 10% below the 1,691,000 ac. of 1955 and far below the 2,387,000 ac. average for the previous decade. The indicated average yield of 986 lb. per acre was high as compared with 925 lb. in 1955 and 790 lb. for 1945–54.

U.S. Peanut Production by Leading States

State	(In thousands of pounds)		Average 1945–54
	Indicated 1956	1955	
Georgia	557,925	513,240	608,353
North Carolina	294,000	204,250	286,900
Virginia	213,500	180,960	206,466
Alabama	203,775	213,750	258,706
Texas	88,550	239,235	252,600
Florida	61,600	61,500	58,650
Oklahoma	46,125	128,640	106,218

Peanut acreage allocation for 1956, as in 1954, was set at the minimum permitted by law of 1,610,000 ac. as compared with 1,731,000 ac. in 1955. However, the large kernel Virginia and Valencia types were in short supply, hence an additional 40,000 ac. were subsequently allocated to those types, mostly grown in Virginia and North Carolina. Production of that area was

510,050,000 lb. as compared with 388,060,000 lb. in 1955 and a 1945-54 average of 496,499,000 lb.

Other peanut types, mostly used for oil, were not in short supply and acreage allotments were held at the minimum. The southeast area produced 836,050,000 lb. as compared with 800,540,000 lb. in 1955 and the 942,772,000 lb. average for 1945-54. The southwest area, hard hit by drought, produced only 142,475,000 lb. as compared with 375,930,000 lb. in 1955 and 370,279,000 lb. average for 1945-54.

As one of the six basic crops, peanut acreage allotted for 1956, except that for production of the Virginia and Valencia type peanuts, was eligible for participation in the acreage reserve phase of the soil bank at the rate of 3 cents per pound for the yield which would have been obtained from the diverted acreage. Participation was on a limited scale except in Texas and Oklahoma.

U.S. consumption of peanuts (shelled) in 1956 was indicated at 4.7 lb. per capita, 9% above 1955 and pre-World War II.

Early indications were for a new record world crop of 12,788,500 tons, as compared with the previous (1955) record of 12,516,500 tons and approximately double the prewar average. About 34,325,000 ac. were devoted to this warm climate crop. India produced 4,700,000 tons, China 2,700,000 tons, French West Africa 950,000 tons, Nigeria and the Cameroons 900,000 tons, and the U.S. 744,300 tons. Argentina, an exporter, was indicated for 177,500 tons, second only to its record 187,100 tons of 1954.

(J. K. R.)

Pears: see FRUIT.

Pearson, Lester Bowles (1897-). Canadian politician and federal cabinet minister, was born on April 23 in Toronto, Ont. He was educated at collegiate institutes in Toronto, Peterborough and Hamilton, Ont., at Victoria college, the University of Toronto, and at St. John's college, Oxford university. In 1923 he joined the staff of the University of Toronto as lecturer in history, later becoming assistant professor.

In 1928 he entered the department of external affairs as first secretary and served in Ottawa until 1935, though special missions took him to Washington, D.C., London, The Hague, Geneva and throughout Canada. In 1935 he was appointed to the office of the high commissioner for Canada in London, Eng., and later became secretary of that office, remaining until 1941 when he was recalled to Ottawa to become assistant under-secretary of state for external affairs. After several other posts, in Jan. 1945 he was named Canadian ambassador to the United States, but in Sept. 1946 he returned to Ottawa as undersecretary of state for external affairs, becoming secretary of state for external affairs in the federal cabinet in Sept. 1948. Elected to the house of commons for Algoma East, Ont., in Oct. 1948, he was re-elected in 1949 and 1953.

In March 1956 Pearson attended a meeting of the presidents of the United States and Mexico and the prime minister of Canada at White Sulphur Springs, W.Va. In May he acted for Canada at the ministerial meeting of the North Atlantic council, Paris, Fr., and was named a member of the "committee of three" to "advise on ways and means to improve and extend NATO co-operation in nonmilitary fields and to develop greater unity within the Atlantic community." He attended the meeting of the NATO committee of three in Paris in June, and the Commonwealth prime ministers' conference in London in July. His book *Democracy in World Politics* was published in 1956.

(M. L. S.)

Pecans: see NUTS.

Pennsylvania. A middle Atlantic state and one of the 13 original states of the union, the commonwealth of Pennsylvania is popularly known as the "Keystone state." Area: 45,333 sq.mi., including 288 sq.mi. of inland waters. Pop.: (U.S. census, 1950) 10,498,012; (July 1, 1956, provisional est.) 10,964,000. Capital: Harrisburg, pop. (1950) 89,554. Other cities with population greater than 75,000 in 1950: Philadelphia, 2,071,605; Pittsburgh, 676,806; Erie, 130,803; Scranton, 125,536; Reading, 109,320; Allentown, 106,756; Altoona, 77,177; Wilkes-Barre, 76,826. The urban population in 1950 numbered 7,403,036 and the rural 3,094,976.

History.—In 1955, in order to solve the fiscal problem of the state, the legislature passed a 3% sales tax. Gov. George M. Leader, the first Democrat in 20 years to hold the gubernatorial office, was faced with a legislative fight which prolonged the session until May 22, 1956.

Major elements of Leader's promised 1954 campaign program which were passed included: (1) reorganization of the duplicative and unco-ordinated administrative agencies and departments of the executive arm; (2) resuscitation of distressed areas of the state with a Pennsylvania industrial development authority; (3) establishment of an urban redevelopment program; (4) expansion of the welfare services in the field of mental health, with the appointment of the first mental health director in the state's history and a \$42,000,000 program for mental health, and the building of three 1,000-bed hospitals for retarded children; (5) provision for the largest single school construction program in the history of the nation (\$500,000,000) and for the training and guidance of physically and mentally handicapped children; (6) provision of a new system of penalties to decrease highway fatalities in the state; (7) inauguration of a new concept in meeting the problems of juvenile delinquency by providing, among other things, mobile forestry camps for juvenile delinquents.

The state's chief elective officials in 1956 were: George M. Leader (Dem.), governor; Roy E. Furman (Dem.), lieutenant governor; Genevieve Blatt (Dem.), secretary of internal affairs; Charles R. Barber (Rep.), auditor general; Weldon B. Heyburn (Rep.), state treasurer.

In the general election, Nov. 6, 1956, the Pennsylvania voters by a substantial majority gave the state's 32 electoral votes to Pres. Dwight D. Eisenhower. However, Joseph Sill Clark, Jr. (Dem.), former mayor of Philadelphia, defeated Sen. James Henderson Duff (Rep.) for a seat in the U.S. senate, by a small margin. The state fiscal offices were won by Republicans. For state treasurer (term beginning May 1957), Robert Kent defeated James Knox, and for auditor general, Charles Smith defeated Francis Smith.

Education.—Statistics for 1956-57 showed a net enrolment of 1,831,929 pupils, including 104,271 in kindergarten, 1,053,871 in the elementary division apart from kindergarten, and 673,787 in secondary school. During 1954-55 there were 1,488 kindergarten teachers, 32,322 elementary teachers and 26,200 secondary or high school teachers; 1,177 elementary principals, 944 secondary school principals, 634 supervising principals and 998 supervisors. The state administration estimated that 50.38% of its total 1955-57 biennial general fund budget, or \$623,462,352, would be expended upon public education. In 1956 Pennsylvania had 123 institutions of higher education; colleges and universities numbered 84.

Social Insurance and Assistance, Public Welfare and Related Programs.—In the first six months of 1956 expenditures by the department of public assistance reached \$61,059,000, including \$35,312,000 of state funds and \$25,747,000 of federal funds. The assistance rolls contained an average of 133,919 cases, including 53,067 cases of old-age assistance, 28,402 cases receiving aid to dependent children, 23,078 general assistance cases, 16,599 blind pensioners and 12,773 cases receiving aid for the permanently and totally disabled. An appropriation of \$15,400,000 was approved for the 1955-57 biennium. The budget of the mental rehabilitation program involving 22 institutions with approximately 49,000 mental patients and including general operations, salaries and expenses and monies for the Council for the Blind, totalled \$143,550,000.

Transportation.—Of the 100,695 mi. of highways in Pennsylvania in 1954, 41,080 mi. were in the state highway system under the supervision of the department of highways. Included in this total were 637 mi. in the cities of Pennsylvania and 2,370 mi. in the boroughs. The Pennsylvania Turnpike, by 1955 consisting of 360 mi. of highway operated by the Pennsylv-

vania Turnpike commission, now stretched from the Delaware river to the Ohio state line. There were 11,136.24 mi. of railroads in operation in Pennsylvania in 1953.

Banking and Finance.—As of Dec. 31, 1955, 304 banking institutions operated under state charters, with total resources of \$7,612,760,397.16. There were 804 insured commercial banks, of which 522 were national banks, 93 were state banks with membership in the federal reserve system and 189 were state banks not members of the federal reserve system. Seven insured mutual savings banks also functioned in the state. The total assets and liabilities of insured commercial banks in Pennsylvania on Dec. 31, 1955, were \$13,918,094,000. The number of depositors in all state banking institutions was 4,902,718. As of Dec. 31, 1955, 724 building and loan associations with assets of \$1,012,442,697.70 were operating in the commonwealth.

The total 1955-57 appropriations proposed by the state administration to the Pennsylvania general assembly from the general fund amounted to \$1,312,197,463. Appropriations and allocations from the motor licence fund from 1955-57 were estimated at \$494,165,656. The gross bonded debt of the commonwealth as of Sept. 1, 1954, stood at \$415,150,000.

Agriculture.—In 1955 the commonwealth had 128,887 farms. The farms of Pennsylvania covered 13,162,093 ac., 45.7% of the total land area. In 1955 Pennsylvania ranked 14th in total cash income from farm marketings,

Table I.—Principal Crops of Pennsylvania

Crop	Indicated 1956	1955	Average, 1945-54
Corn, bu.	68,692,000	61,364,000	61,501,000
Wheat, bu.	15,903,000	15,964,000	19,832,000
Oats, bu.	30,303,000	33,306,000	26,509,000
Barley, bu.	9,500,000	9,065,000	5,492,000
Rye, bu.	598,000	484,000	286,000
Soybeans, bu.	529,000	440,000	400,000
Alfalfa hay, tons	1,620,000	1,350,000	794,000
Clover and timothy hay, tons	1,997,000	1,790,000	2,513,000
All hay, tons	3,811,000	3,306,000	3,483,000
Potatoes, cwt.	8,275,000	8,410,000	9,898,000
Tobacco, lb.	50,150,000	45,725,000	49,660,000
Apples, commercial, bu.	4,370,000	6,500,000	5,945,000
Peaches, bu.	2,340,000	2,900,000	2,311,000
Pears, bu.	70,000	140,000	188,000
Cherries, sweet, tons	300	1,300	1,090
Cherries, sour, tons	6,500	13,000	7,260
Grapes, tons	26,200	24,000	17,900

Source: U.S. Department of Agriculture.

with \$734,513,000 in agricultural earnings. Thirty-three per cent was derived from dairy products, while 25% was obtained from poultry and eggs. The income from all livestock and poultry amounted to \$559,706,000, or 77% of the total farm cash income. The value of fruits and crops totalled \$174,807,000.

Table II.—Principal Industries of Pennsylvania

	All em- ployees, 1954	Salaries and wages, 1954 (in 000s)	Value added by manu- facture, 1954 (in 000s)	Value added by manu- facture, 1953 (in 000s)
Food and kindred products	113,852	\$418,747	\$826,260	\$ 687,657
Tobacco manufactures	16,363	38,993	76,305	84,528
Textile mill products	102,672	324,650	508,753	601,187
Apparel and related products	155,589	370,678	538,109	556,504
Furniture and fixtures	22,942	77,403	122,454	137,750
Print, paper and products	37,434	153,440	297,806	305,523
Printing and publishing industries	61,836	275,881	469,444	423,212
Chemicals and allied products	45,182	200,220	509,249	547,461
Petroleum and coal products	25,914	125,935	292,809	323,709
Metalliferous products	13,388	56,865	124,442	159,363
Leather and leather products	30,626	82,401	122,718	131,522
Stone, clay and glass products	64,729	260,853	497,471	509,080
Primary metal industries	240,485	1,077,368	1,781,373	2,303,385
Fabricated metal products	107,381	457,685	773,463	814,143
Machinery (except electrical)	134,618	609,478	1,086,898	1,029,488
Electrical machinery	102,680	428,844	885,341	1,064,844
Transportation equipment	64,219	312,111	501,335	583,636
Instruments and related products	25,492	107,659	181,961	202,125
Miscellaneous manufactures	45,387	168,903	284,373	248,943

Source: U.S. Department of Commerce, 1954 Census of Manufactures, preliminary report.

Table III.—Mineral Production of Pennsylvania

Mineral	1953 Quantity	Value	1954† Quantity	Value
Total		\$1,121,622,000		\$926,280,000‡
Cement (bbl.)	42,094,000	114,003,000	43,068,000	117,912,000
Clays	3,575,000	9,988,000	3,524,000	10,243,000
Coal, anthracite	30,949,000	299,140,000	29,083,000	247,870,000
Coal, bituminous	93,331,000	516,490,000	72,010,000	378,659,000
Coal, lb.	564,000	†	517,000	†
Coke*	23,383,000	324,003,000	15,998,000	238,080,000
Copper	3,000	1,737,000	3,000	1,929,000
Ferroalloys*	661,000	163,485,000	473,000	110,932,000
Iron ore	1,143,000	†	793,000	†
Lead, pig*	20,504,000	1,039,286,000	14,652,000	740,221,000
Lead	1,335,000	16,010,000	1,082,000	13,206,000
Natural gas (000 cu.ft.)	105,558	30,717,000	145,934	43,634,000
Natural gasoline (000 gal.)	†	†	5,000	320,000
Petroleum (bbl.)	10,649,000	45,680,000	9,107,000	31,150,000
Sand and gravel	14,715,000	20,692,000	14,218,000	20,596,000
Slate	202,000	4,420,000	194,000	4,419,000
Stone	26,193,000	48,094,000	40,522,000	61,193,000
Sulphuric acid*	336,000	6,005,000	293,000	5,577,000
Other minerals . . . . .	...	14,651,000	...	10,918,000

*Values for processed materials are not included in the totals.

†Value included with other minerals.

‡Preliminary.

§Total has been adjusted to eliminate duplication in the value of clays and stone.

Source: U.S. Bureau of Mines.

Manufacturing.—According to the records of the state department of labour and industry, the business and industrial establishments of the commonwealth covered by the Pennsylvania unemployment compensation law at the end of 1954 totalled 196,000 concerns, employing an average of 3,020,808 workers, earning \$11,066,855,000 in wages and salaries during that year. It was estimated that 20,100 manufacturing companies operated during 1954, with 1,470,343 workers engaged in manufacturing getting \$5,900,940,000 in earnings for these 12 months. By a 1953 estimate, Pennsylvania's industrial establishments produced \$24,600,421,000 worth of products for the U.S. market.

Mineral Production.—Table III shows the tonnage and value of those minerals produced in Pennsylvania in 1953 and 1954 whose value exceeded \$100,000. In 1954 Pennsylvania led in production and consumption of coke, was first in output of pig iron and steel and in crushed stone, was second in output of coal (the only state that produces anthracite coal), fire clay and slate, third in lime production and fourth in petroleum asphalt sales and in output of selenium. It ranked fourth among the states in value of its mineral output, with 6.21% of the U.S. total.

ENCYCLOPEDIA BRITANNICA FILMS.—*Northeastern States*, 2nd ed. (1955).

Pension, Old-Age: see SOCIAL SECURITY. See also under various states.

Pensions, Veterans': see VETERANS ADMINISTRATION (U.S.).

Performing Right Societies: see SOCIETIES AND ASSOCIATIONS, U.S.: *American Society of Composers, Authors and Publishers*.

Persia: see IRAN.

Persian Gulf States. The following are British-protected Arab sheikhdoms of the Persian gulf area. The headquarters of the British political resident, Persian gulf, is at Manama, Bahrein. Agent in 1956, Sir Bernard Burrows.

Bahrein.—This archipelago lies 20 mi. off the gulf coast of Saudi Arabia. Total area, 231 sq.mi.; pop. (1955 est.), 120,000 (about 50% Shia Moslems). Chief towns (pop., 1955 est.): Manama (cap.) 45,000; Muharrek 20,000. Sheikh, Sulman bin Hamad al-Khalifah; British political agent in 1956, C. A. Gault.

Katar (Qatar).—Area, 8,500 sq.mi.; pop. (1955 est.), 35,000. Cap., Doha (or Bida). Sheikh, Ali bin Abdullah al-Thani; British political agent in 1956, D. C. Carden.

Kuwait.—Area, 8,000 sq.mi.; pop. (1954 est.), 200,000. Cap., Kuwait, pop. (1953 est.), 25,000. Sheikh, Abdullah bin Salim as-Subah; British political agent in 1956, G. W. Bell.

Trucial Sheikhdoms (or Trucial Oman, Trucial Coast).—Abu Dhabi, Ajman, Dubai, Fujairah, Ras al-Khaiman, Sharjah and Kalba, and Umm al-Kawain sheikhdoms. Total area, 5,792 sq.mi.; total pop. (1955 est.), 80,000. Chief towns: Dubai (chief port and British political agent's headquarters); Sharjah; Abu Dhabi (port). British political agent in 1956, J. P. Tripp.

History.—The year 1956 was marked by the emergence of nationalism and democratic movements in the principalities of the Persian gulf. In Kuwait, despite the great wealth from oil and the rapid transformation of the country into a welfare state, the opposition to the autocratic and mediaeval character of the sheikh's government grew steadily.

In Bahrein there was an antigovernment and anti-British demonstration during the British foreign secretary's visit early in March. Subsequently the reformers were able to express their demands in a moderate movement called the Committee of National Union, and the sheikh formed an administrative council including civil servants. During the Suez crisis demonstrations in favour of Egypt took place in Kuwait, Bahrein and Katar, and as a result of the Anglo-French military action against Egypt, rioting broke out in Bahrein and the Katar oil pipeline was blown up.

(E. S. AH.)

Production.—Oil production in metric tons for recent years was as follows:

Area	1952	1953	1954	1955
Bahrein.	1,505,000	1,500,000	1,500,000	1,500,000
Katar	3,297,000	4,056,000	4,776,000	5,448,000
Kuwait*	37,637,000	43,284,000	48,575,000	56,018,400

*Including Kuwait neutral zone.

Finance and Trade.—*Muscat and Oman.*—Monetary units: Indian rupee (official) valued at 21 cents U.S.; Maria Theresa dollar (common medium of exchange) and (in Dhofur province) half dollar; in interior generally, copper baiza (200 baizas=1 Maria Theresa dollar=about Rs. 2.5) with nickel coins for multiples. Foreign trade (1954–55): £2,688,300, exports £1,348,250; imports from U.K. (1955) £328,088; re-exports from U.K. £2,393; exports to U.K. £21,725. Chief imports: cereals, tea, coffee, sugar, tobacco, cotton goods. Chief exports: dates (1955) £612,757, fish and fish products £382,747; pomegranates and limes £169,387.

Kuwait.—Monetary unit: Indian rupee. Foreign trade (1954): imports £30,000,000, exports £4,000,000. Imports from U.K. (1955) £8,099,303; exports to U.K. £125,604,753. Chief exports: petroleum and pearls.

Bahrain and Katar.—Monetary unit: Indian rupee. Foreign trade (including tracial Oman) (1954): Imports £13,400,000. Imports from U.K. (1955) £12,521,006; exports to U.K. (1955) £20,947,880. Chief exports: petroleum products, rice, pearls. Chief imports (Bahrain): textiles, machinery, motor vehicles, sugar.

Trucial Sheikhdoms.—Monetary unit: Indian rupee. Foreign trade (1954): imports Rs. 28,444,211; exports Rs. 4,638,066. Chief products and exports: pearls, dates, dried fish.

Peru. A republic situated on the west coast of South America and bounded on the north by Ecuador and Colombia, on the east by Brazil and Bolivia, on the south by Chile and on the west by the Pacific ocean, Peru has an area of 506,189 sq.mi. The population, 9,396,000 according to a 1955 official estimate, is composed approximately of 52% "white" and mestizo and 46% Indian; there are also some Negro and Asian elements to the extent of about 2%. Lima, the capital, has a population (1952 est.) of 926,400. The population estimates for other major cities are: Callao, 104,500; Arequipa, 100,900; Cuzco, 58,400; Trujillo, 49,600; Iquitos, 44,000; Chiclayo, 41,600; Huancayo, 36,500; Sullana, 28,470; Ica, 27,300; and Piura, 25,600. Language: Spanish, although Quechua is still spoken by some of the highland Indians. Religion: predominantly Roman Catholic. Presidents in 1956, Gen. Manuel Odría until July 28; thereafter Manuel Prado y Ugarteche.

History.—During 1956 Pres. Manuel Odría's administration continued its policy of order and progress. Occasionally prospects dimmed for a free and democratic election, but an honest presidential balloting was held as Odría promised. Although eight candidates entered the presidential race, five dropped out in May because they either lacked support, anticipated fraud or did not wish to divide the vote hopelessly. Among the three remaining candidates were independent Hernando de Lavallo, backed by the pro-Odría party; Fernando Belaúnde Terry, an independent; and former (1939–45) Pres. Manuel Prado y Ugarteche, backed by the Movimiento Democrático Pradista. More than 79% of the registered voters turned out to give Lavallo 233,000 votes, Belaúnde Terry about 458,000 votes and Prado more than 568,000 votes. Independent candidates were most successful in the chamber of deputies contests, and *pradistas* were strongest in the races for the senate.

Immediately following his July 28 inauguration, President Prado decreed general amnesty for political prisoners and exiles and restored the legal status of the outlawed party Alianza Popular Revolucionaria Americana. He abolished censorship, obligatory broadcasting of government releases and certain privileges of military officers. Investigations of the previous administration were begun, and various reforms were instituted.

Odría's last year in office was marked by a sound currency, a budgetary surplus, the building of many public works, renewed diplomatic relations with Ecuador, increased petroleum exploration and improved metals and ores exports. Problems which faced both Odría and his successor included a year's drought and severe spring frosts on the Altiplano. As much as 60% of some crops were ruined; pastures were in a very bad state. To avert famine U.S. surplus food was imported. Meanwhile, coastal cotton growers were distinctly unhappy about United States dumping of surplus cotton, and the sugar cane producers were angry at being allocated only 51,871 tons of the United States sugar market.

Inflation caused labour to demand wage increases. Postal and telegraph employees struck briefly during April in several cities. Textile workers were restless, and municipal railway workers in Lima struck in May. Settlement of the latter walkout resulted in increased fares, which precipitated a paralyzing and violent general strike late in June. It was joined by students who had been striking for some time to oust the director of San Marcos university and to obtain a greater voice in the university's administration. The general strike produced a 30-day suspension of civil rights which was not lifted until just before the inauguration of President Prado. The general strike was settled on July 2. The students ended their 73-day walkout on July 23.

(R. HN.)

Education.—In 1953 there were 10,421 public primary schools with 23,147 teachers and 908,936 pupils and 1,348 private schools with 4,214 teachers and 137,900 pupils. The 114 public secondary schools had 2,686 teachers and 47,873 students; 204 private secondary schools had 3,100 teachers and 35,471 students. University education was available at four public universities—Lima (8,771 students in 1952), Arequipa (890), Cuzco (791) and Trujillo (1,616)—and at the Catholic university of Lima (1,453).

Finance.—The monetary unit is the sol, valued at 5.26 cents U.S. currency, exchange certificate rate, and at 5.25 cents, free rate, on Nov. 24, 1956. The 1956 budget, including special accounts, was balanced at 3,885,473,412 soles. The public debt on Dec. 31, 1954, totalled 1,989,800,000 soles, of which 359,600,000 soles represented the external debt. Currency in circulation (June 30, 1956) totalled 1,767,000,000 soles; demand deposits, 2,420,000,000 soles. The U.S. department of commerce estimated U.S. direct private investments in 1955 at \$301,000,000, of which mining and smelting investments accounted for \$193,000,000. The cost-of-living index (Lima) stood at 119 in Aug. 1956 (1953=100). National income in 1954 was estimated at 18,690,000,000 soles.

Trade and Communications.—Exports in 1955 totalled 5,146,335,000 soles; imports, 5,764,114,000 soles. Leading exports were cotton (25%), sugar (14%), copper (11%), lead (10%) and petroleum and products (8%); leading imports, machinery and vehicles (34%), food, drink and tobacco (15%) and chemicals and drugs (10%). Leading customers were the U.S. (36%), Chile (13%), the U.K. (10%), Germany (7%) and Belgium (6%); leading suppliers, the U.S. (50%), Germany (9%), the U.K. (9%), Argentina (5%) and the Netherlands (3%).

Railroads (1951) totalled 2,800 mi.; highway mileage was 19,466, of which 7,894 mi. were hard-surfaced. On Jan. 1, 1955, there were 51,471 automobiles, 39,940 trucks and 4,940 buses. According to *Lloyd's Register of Shipping*, the merchant marine had 47 vessels (100 tons and over) aggregating 98,492 gross tons on June 30, 1955. Telephones (Jan. 1, 1955) numbered 60,300, 82.3% of which were automatic and 69% of which were located in Lima.

Agriculture.—Production estimates in 1955–56 (preliminary figures) included cotton (lint) 99,000 metric tons; sugar 690,000 tons; rice (rough) (1954–55) 227,000 tons; wheat 167,000 tons. In 1955, 85,160 tons of cotton and 497,239 tons of sugar and derivatives were exported. In Dec. 1954 there were 538,000 horses, 3,476,000 cattle, 16,821,000 sheep, 1,351,000 pigs; (1953) 2,283,000 goats; (1952) 3,380,900 alpacas and llamas. In 1955, 3,694 metric tons of wool were exported.

Minerals.—Production of the principal minerals in 1955 (preliminary figures) was as follows: copper (in ore) 48,142 short tons; lead 122,902 tons; zinc (in ore) 166,718 tons; silver 20,954,823 oz.; gold 160,310 oz.; antimony 1,055 tons; iron ore (metal content 60%) 1,940,500 tons. Petroleum production totalled 17,190,000 bbl.

(J. W. Mw.)
ENCYCLOPEDIA BRITANNICA FILMS.—*Land of the Incas* (1955); *Peru (People of the Mountains)* (1940).

Petroleum. In 1956 the interest of the petroleum world centered on the Suez canal crisis. An average of 1,500,000 bbl. of petroleum a day moves through the canal. The nationalization of the canal by Egypt raised not only the possibility of the cutting of this vital transport link, but the question of whether a wave of nationalization might sweep across the oil-rich countries of the middle east upon whose resources Europe, the far east and even the United States had become increasingly dependent.

World petroleum production for the first nine months of 1956 totalled 4,597,309,000 bbl., of which the United States accounted for 42.50%, a decline from the 44.56% for the full year 1955 and 60.04% for 1945. (Table I.) In 1956 the middle east contributed 24% of the world total compared with 10.1% in 1947.

However, the middle east had 70% of the world's crude oil reserves estimated at 153,000,000,000 bbl. The United States and Venezuela continued to produce more oil than the middle east, but they had not the comparable reserves, and the United States had become a net importer of crude oil, with 15% to 20% of its imports coming from the middle east.

Table I.—World Production of Crude Oil

Year	United States	Per cent	Rest of world	Per cent	Total world
(In 000 bbl.)					
1st 9 mo. 1956*	1,954,067	42.50	2,643,242	57.50	4,597,309
1st 9 mo. 1955*	1,838,254	44.94	2,252,624	55.06	4,090,878
1955†	2,484,521	44.56	3,090,989	55.44	5,575,510
1954†	2,314,988	46.40	2,674,576	53.60	4,989,564
1953	2,357,082	49.41	2,413,697	50.59	4,770,779
1952	2,289,836	50.78	2,219,120	49.22	4,508,956
1951	2,247,711	52.43	2,039,115	47.57	4,286,826
1950	1,973,574	51.90	1,829,421	48.10	3,802,995
1949	1,841,940	54.11	1,562,202	45.89	3,404,142
1948	2,020,185	58.84	1,413,049	41.16	3,433,234
1947	1,856,987	61.45	1,165,152	38.55	3,022,139
1946	1,733,939	63.16	1,011,491	36.84	2,745,430
1945	1,713,655	66.04	881,042	33.96	2,594,697
1940	1,353,214	62.94	796,607	37.06	2,149,821
1935	996,596	60.24	657,892	39.76	1,654,488
1930	898,011	63.60	513,893	36.40	1,411,904
1925	763,743	71.45	305,190	28.55	1,068,933

*Estimated. †Preliminary.
Source: U. S. Bureau of Mines.

Emergency steps taken to meet any oil crisis included programs to supply the free world, and particularly Europe, principally from the United States, which had an estimated shut-in production in excess of 2,000,000 bbl. per day, supplemented by Venezuelan and Canadian sources; the pooling of transport facilities; the ordering of new supertankers and the withdrawal of a number of large tankers from the United States mothball fleet. The transport plans were devised to meet the possible need of long hauls around the Cape of Good Hope and to anticipate any reduction or stoppage of flow of middle eastern oil through existing pipelines to the Mediterranean.

Fears that Egypt's surprise move might ignite a wave of nationalization in the middle east subsided after the first shock. Iraq and Saudi Arabia had the experience of Iran to look back upon as a sobering influence and were reported to have given assurances that they contemplated no such action. During the last few years, countries wishing to develop their oil resources had tended from, rather than toward, nationalization. With one or two exceptions, petroleum laws adopted had been phrased so as to invite foreign capital and participation. They had embraced a 50-50 profit-sharing principle between government and company and liberal depletion allowance during the exploration phase. As a result, a wave of wildcatting unprecedented in history swept over the world. Not only did the large "international" oil companies expand their operations in many countries, but companies formerly interested solely in domestic producing, with sufficient resources, went into foreign exploration and development. For instance, in 1956, a Tulsa independent company acquired 4,300,000 ac. in Cuba as its first move into foreign search. At the same time it acquired about 700,000 ac. in four areas in the Philippines.

United States.—United States liquid hydrocarbon reserves totalled 35,450,735,000 bbl., as of Dec. 31, 1955, an increase of 445,532,000 bbl. over 1954. Crude oil production in 1955 increased to 2,484,521,000 bbl. from 2,314,988,000 bbl. in 1954. (Table II.) The production of motor fuel continued to rise dur-

Table II.—U.S. Petroleum Production

Year	Crude oil (000 bbl.)	Natural gas liquids* (000 bbl.)	Total liquid petroleum (000 bbl.)	Natural gas cu.ft. gross
1st 7 mo. 1956*	1,523,976	165,548	1,689,524	†
1st 7 mo. 1955*	1,432,018	149,029	1,581,047	†
1955†	2,484,521	263,976	2,748,497	10,984,850
1954	2,314,988	252,133	2,567,121	10,645,798
1953	2,357,082	238,579	2,595,661	10,272,566
1952	2,289,836	223,897	2,513,733	9,689,372
1951	2,247,711	204,965	2,452,676	8,479,650
1950	1,973,574	182,119	2,155,693	7,546,825
1949	1,841,940	157,275	1,999,215	7,178,777
1948	2,020,185	147,079	2,167,264	6,733,230
1947	1,856,987	132,863	1,989,850	6,190,200
1946	1,733,939	117,809	1,851,748	5,902,180
1945	1,713,655	114,884	1,828,539	5,694,100
1940	1,353,214	58,867	1,412,081	2,498,005
1935	996,596	41,204	1,037,800	†
1930	898,011	55,320	953,331	†
1925	763,743	28,702	792,445	†

*Natural gasoline and benzol. †Estimated. ‡Not available.
Sources: U.S. Bureau of Mines; American Gas Association.

Table III.—U.S. Production of Motor Fuel

Year	Quantity	Year	Quantity
(In 000 bbl. of 42 gal.)			
1st 7 mo. 1956*	823,687	1948	919,723
1st 7 mo. 1955*	772,123	1947	841,667
1955†	1,361,323	1946	775,816
1954	1,261,304	1945	793,431
1953	1,266,376	1940	616,314
1952†	1,192,965	1935	469,571
1951	1,139,659	1930	444,327
1950	1,024,181	1925	268,668
1949	960,747		

*Estimated. †Preliminary. ‡Figures for 1952 and prior include some motor fuel used as jet fuel components.
Source: U. S. Bureau of Mines.

Table IV.—U.S. Production of Fuel Oil, Distillate Fuel and Residual Fuel Oil

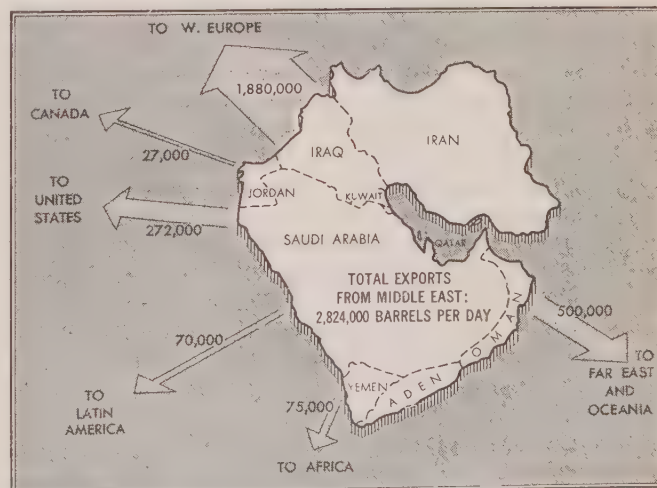
Year	Distillate	Residual fuel oil	Total fuel oil
(In 000 bbl. of 42 gal.)			
1st 7 mo. 1956*	381,751	252,072	633,823
1st 7 mo. 1955*	348,856	243,610	592,466
1955†	603,162	420,331	1,023,493
1954	542,278	416,757	959,035
1953	528,111	449,979	978,090
1952†	520,378	453,897	974,275
1951	475,801	469,377	945,178
1950	398,912	425,217	824,129
1949	340,825	424,909	765,734
1948	379,340	479,988	859,328
1947	312,173	447,795	759,968
1946	287,896	431,364	719,260
1945	249,224	469,492	718,716
1940	183,304	316,221	499,525
1935	100,235	259,826	360,061
1930			372,498
1925			364,991

*Estimated. †Preliminary. ‡Figures for 1952 and prior include some material used as jet fuel components. §Not available prior to 1932.
Source: U.S. Bureau of Mines.

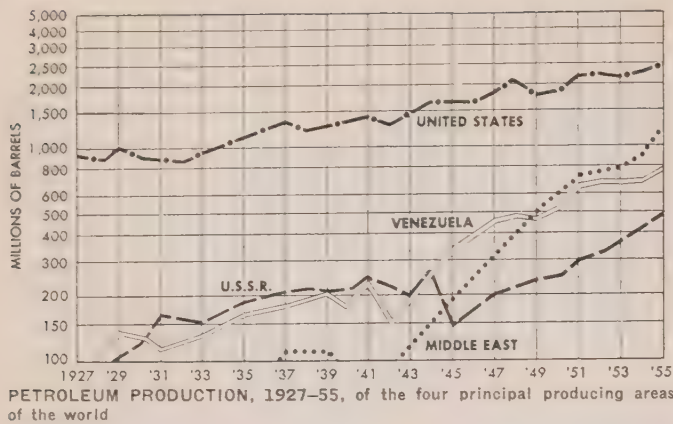
ing the first seven months of 1956, and in 1955, 1,361,323,000 bbl. were produced compared with 1,261,304,000 bbl. in 1954. (Table III.) Distillate and residual fuel oil production for 1955 was 1,023,493,000 bbl. against 959,035,000 bbl. in 1954. (Table IV.)

Canada.—Operations in Canada were at an all-time peak in 1956 with midyear production at about 415,000 bbl. daily. Inaccessibility rendered this source less immediate than Latin America, nevertheless authorities predicted pipeline outlets and markets for 550,000 bbl. daily by 1960 and 1,000,000 bbl. daily by 1970. Reserves estimated in 1956 at about 3,000,000,000 bbl. were expected to reach close to 11,000,000,000 bbl. by 1980. Prospects for Alberta's Pembina field continued to improve and in 1956 the field passed the 100,000 bbl. per day mark.

Europe.—Italy had under consideration in 1956 a petroleum bill which was considered an exception to the trend in that it ignored the usual 50-50 principle and imposed a number of restrictions on operations of foreign companies. Unfavourable leg-



MIDDLE EAST OIL EXPORTS, in number of barrels per day



isolation in 1955 drove one U.S. company from Italy after it had opened up promising Po valley prospects, and restrictions also caused interruption in developments in Sicily by a U.S. company.

Standard Oil (New Jersey), which opened up a new field in southern France in 1954, expanded its exploration there, as did British Petroleum and several other companies.

Asia.—A sensational strike was made at Qum, north central Iran—a rank wildcat 200 mi. from the nearest source of production, by the National Iranian Oil company. Reported to flow 80,000 bbl. daily, it caught fire but finally was controlled and shut down. In Israel late in 1956, eight wildcats in widely separated areas were drilling in an attempt to expand the country's 1955 initial production from its three-well field at Heletz. India's movement toward nationalization of oil slowed down in 1956 when the government accepted a broad compromise agreement with Assam Oil company, a subsidiary of Burmah Oil company, on the role each would play in a new industry developing around Upper Assam's growing Nahorkatiya field.

South America.—In Venezuela sometime before the Suez canal seizure, a boom was in progress, largely stimulated by Venezuela opening up new territory for bids for the first time since 1948. Eagerly sought, the concessions covered about 300,000 ac. of proved and semiproved oil lands for lease and brought the Venezuelan government nearly \$400,000,000. The early development of this new acreage promised a substantial increase in Venezuela's production of 2,200,000 bbl. a day.

Colombia, producing about 120,000 bbl. of petroleum a day and ranking second to Venezuela among South American countries, followed its neighbour's example in encouraging new exploration. New applications were asked for on 70 options covering more than 7,500,000 ac. Sixteen companies were engaged in exploratory activity in Peru, principally on the eastern side of the Andes.

In 1956 a new petroleum law in Chile was prepared, an early draft indicating that the most promising areas would be reserved for the government-owned company, which produces about 4,000 bbl. a day in the far south. In Argentina a projected concession to be given a U.S. company was vitiated by the fall of Juan Perón. The new regime announced itself in favour of foreign investment except in the oil and electric power fields.

Central America.—In Panama two independent U.S. companies were granted concessions or shares in concessions of 10,000,000 ac. and 2,240,000 ac. respectively. Two concessions in Honduras were granted to two Texas firms, one covering 10,300,000 ac. and the other an interest in 50,000,000 ac. A new petroleum law was before the legislators in Costa Rica in 1956. The country had granted a large concession to a U.S. company which had drilled five wells, one of which in 1956 gave promise of becoming Central America's first producer. Guatemala put a new petroleum law in effect in 1955, and in 1956 was in the process of allotting 7,500,000 ac. to 29 companies for exploration and

development.

(See also FOREIGN INVESTMENTS; GEOLOGY.) (L. M. F.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Conservation of Natural Resources* (1937); *Story of Petroleum* (1947).

Philadelphia. The estimated population of the city and county of Philadelphia, Pa., was 2,179,000 in 1956, an increase of nearly 108,000 over the 1950 national census count of 2,071,605. Public and parochial schools had in 1956 a combined enrolment of 366,490. Philadelphia is the third largest city in the United States and the largest in Pennsylvania. It covers 135 sq.mi., including 7.8 sq.mi. of water. Within its borders lie the 4,045 ac. of Fairmount park, the largest municipal park in the United States.

Commercial and industrial activity continued high during 1956. Employment in Philadelphia, and in the seven-county area, of which the city is the hub, showed a slight increase. Available estimates placed employment in manufacturing industries of this greater area at 575,000, while nonmanufacturing employment stood at 860,000, a rise of 23,000 over 1955. Of the total estimated labour force of 1,637,000, which included self-employed and agricultural workers, an estimated 56% were Philadelphia residents.

Philadelphia, whose fresh-water port located on the Delaware river is the largest of its kind in the world, was the nation's second biggest port in terms of total tonnage in 1955. Total exports and imports in 1955 amounted to 86,858,625 short tons, an increase of about 9% over 1954. Of this amount, 47,096,886 tons were moved in domestic coastal traffic. Foreign water-borne tonnage included 3,610,961 tons of exports (up 39%) valued at \$324,076,600, and 36,150,777 tons of imports (up 20%) valued at \$799,653,100. This volume of foreign import tonnage represented 25% of the nation's total. Philadelphia's department of commerce estimated unofficially that foreign water-borne commerce would reach at least 40,000,000 short tons in 1956.

Retail sales in the city reached \$2,854,760,000 in 1955 and bank clearings totalled \$59,962,000,000.

The city's assessed real estate value for 1956 was \$3,732,301,325 and Philadelphia's realty tax was \$3.025 per \$100. The city's funded indebtedness consisted on Sept. 1, 1956, of \$568,197,800 of issued bonds, of which \$205,438,138 were self-supporting and not charged against the city's borrowing limit. Operating budget appropriations for 1956 were \$202,215,411; appropriations in 1955 were \$192,051,609.

Of slightly more than \$42,000,000 in public works contracts let by the city during the first nine months of 1956, water and sewer improvements accounted for \$24,340,000; street paving and repair, \$6,447,000; street lighting, \$2,733,000; transit facilities, \$991,000; recreation facilities, \$1,578,000; and other building improvement and repairs \$5,982,000.

Passenger traffic at International airport increased 18% in 1956, and the city commenced work on a parallel instrument runway to accommodate the largest jet planes. In the field of city planning, private enterprise joined with the municipal government in launching a program to redevelop and rehabilitate the centre of the city at an estimated cost over the next 15 years of \$250,000,000. The program contemplated activity in residential, commercial and light industrial areas. In 1956, the city also undertook a vast port improvement program, which would culminate in the construction of a five-berth marine terminal with the most advanced cargo-loading equipment. Following the opening of a new 22-block section of the Market street subway, the city in 1956 removed the archaic elevated structure which had previously carried the high-speed trains. Work was completed on the rehabilitation of the city's commercial exhibition buildings, after which they were combined with Convention hall into a trade and convention centre.

At Penn Center, west of city hall, two more buildings—a transportation centre and the city's first new hotel in 25 years—became part of the Philadelphia sky line.

In the 1955 municipal elections, the Democratic party retained control of the administration with a virtual sweep of city offices. Richardson Dilworth defeated W. Thacher Longstreth by 132,000 plurality and succeeded Joseph S. Clark, Jr., as mayor. (RN. D.)

Philanthropy: see DONATIONS AND BEQUESTS.

Philately. The fifth International Philatelic exhibition was held in the Coliseum in New York city. April 28 to May 6, 1956. The stamp show drew a total of 65,000 admissions the first day.

From the point of view of sales, 1956 was said to be one of the most remarkable in the entire history of philately. Sales from the estate of Alfred H. Caspary, New York broker, realized \$1,240,697 in six sessions. Sales from this estate were to continue through 1958, and were expected to bring more than \$3,000,000, the largest sum ever realized in stamp auctions from a single owner. The Philatelic agency, established by the U.S. post office department in Washington, D.C., for the sale of unused United States stamps to and for collectors, grossed \$1,894,854 in the year ending June 30, 1956. This brought the total sales by the agency to collectors in 35 years to \$46,256,175.

A third development in the philatelic world was the interest in stamps by the president of the United States as a means of establishing good will. Of the philatelic items released during 1956, two were selected for White House ceremonies. The first was in the nature of a preview when Pres. Dwight D. Eisenhower presided over ceremonies relating to the three-cent Labor day commemorative on Sunday, Sept. 2. The stamp itself was released in Camden, N.J., on Sept. 3. The second occasion was the issuance of the three-cent children's friendship stamp, which went on sale Dec. 15. An impressive group of youth leaders were invited to the White House, Dec. 20, for special ceremonies.

Another milestone was the appearance in late October of part I of the *Minkus New World Wide Stamp Catalog*. So long as the average collector and professional could recall, there had been only the Scott catalogs to consider. The Minkus catalog was produced in collaboration with a large number of American authorities.

There were 22 philatelic items released in the United States during 1956. All the remaining values of the so-called "liberty series" were issued. These individual stamps were: Jan. 10, Woodrow Wilson stamp, Staunton, Va.; Feb. 22, 1½-cent Mount Vernon; March 19, \$5 Alexander Hamilton; April 13, 20-cent Monticello; June 14, 9-cent "Alamo"; and July 4, 10-cent Independence hall.

Other special stamps released during 1956 were: the 300th anniversary of the birth of Benjamin Franklin, Jan. 17 at Philadelphia; and the 100th anniversary of the birth of Booker T. Washington, at the Booker T. Washington birthplace (Va.), April 5.

For the fifth International Philatelic exhibition the post office department authorized four items. They were the 11-cent souvenir sheet, embracing the 3- and 8-cent "liberty" values (April 28); a special 3-cent stamp with a view of the Coliseum (April 30); a 16-cent airmail envelope (May 2); and a 2-cent postal card (May 4).

Other special stamps included the wild turkey (May 5), pronghorn antelope (June 22) and king salmon (Nov. 13) conservation stamps; the three-cent Pure Food and Drug acts golden jubilee; three-cent "wheatland" commemorative of Aug. 5; the Labor day stamp of Sept. 3; the odd black on orange Princeton hall stamp



U.S. STAMP ISSUE of May 5, 1956, the first of three designed to emphasize the importance of wildlife conservation

of Sept. 22; the three-cent Devil's Tower monument stamp of Nov. 9; and the deferred and bandied three-cent children's friendship adhesive which finally appeared Dec. 15.

The final emissions of 1956 were the four-cent international postal card and the eight-cent (four-cent plus four-cent) international reply postal card, released Nov. 16 at New York city during the eighth annual American Stamp Dealers' association show.

Scheduled for 1957 release were the Alexander Hamilton bi-centennial; coast and geodetic survey 150th anniversary; Oklahoma state golden jubilee; American teachers; and a fourth wildlife conservation stamp.

The United Nations Postal administration was faced with an unexpected demand for its postal issues. Long before the final special adhesives of 1956 were released, stocks of the older emissions were being sold out. At the end of the year the only stamps available were the Human Rights day adhesives issued Dec. 10, 1956. In all, eight stamps were released by the United Nations during 1956—ITU, WHO, UN day and Human Rights day sets of three- and eight-cent values.

In foreign emissions, commemoratives and special issues were the rule. Several nations committed themselves to the release of stamps honouring Benjamin Franklin. Nations interested and participating were the United States, France, Argentina, Cuba, Turkey and the U.S.S.R.

The most popular field was emissions pertaining to the Olympic games at Melbourne, Austr. (F. R. B.)

Philippines, Republic of the. The Philippines is a republic situated in the western Pacific ocean east of Indochina and consisting of an archipelago of 7,100 islands, totalling 115,707 sq.mi. The 1948 census tabulated 19,234,182 persons (1956 est. 22,265,000). The chief city is Manila, whose metropolitan area contains about 1,450,000 persons. Other cities (pop. 1954 est.) are Cebu 182,000, Iloilo 121,000 and Bacolod (1952) 126,200. Statistics listed Davao at 128,000, Basilan at 127,000 and Zamboanga at 120,000 on July 1, 1956, but the cities are far smaller, since all three politically include large rural areas and populations. The official capital is Quezon City, whose 125,000 persons are included in the figure for metropolitan Manila, but most government offices remain in Manila. In 1956 there were 28 chartered cities. Official statistics list 5,512 Americans, 4,212 other occidentals and 132,000 Chinese resident in the islands, but the totals in each group are believed to be much larger.

Most Filipinos are Roman Catholic or native Aglipayan Catholic in religion, the total estimated at more than 19,500,000. In the southern islands live an estimated 850,000 Moslems, whereas 475,000 Protestants and 700,000 pagans are widely scattered. President in 1956: Ramón Magsaysay.

History.—The Nov. 1955 elections gave President Magsaysay's Nacionalista party a clear majority in congress. This reflected the popularity of the president and the approval by the voters of his domestic program of land reform, improving efficiency in government and developing a program of industrialization, and his foreign policy of friendship to the United States and participation in programs of the free nations of the world. In the congress, however, delaying tactics and opposition to the president continued to hinder reform and efficiency measures. The regular session of congress adjourned without completing legislation on many measures requested by the president, as did the special session also. Opposition seized the issue of alleged perpetual United States control over military bases in the Philippines, in an attempt to create popular opposition to the president. United States announcement that no perpetual control was desired dissolved the opposition without creating a crisis.

In general the year was uneventful in the islands in respect to major happenings, but there was steady implementation of irrigation and power projects, land settlement projects, reorganization of government services and other steps in the president's program. The industrial development program for the future was significantly aided by legislative approval of most of the president's 1956-57 fiscal year budget, which involved significant borrowing and allocation of a very marked share of the total funds to basic development programs.

Education.—The national budget for the year 1956-57 authorized an expenditure of \$120,300,000 upon all forms of public education. Including private schools, for which no expense data were obtainable, there were, in June 1955, 26,576 elementary schools having 4,156,000 pupils and 88,514 teachers, 1,620 secondary schools having 647,000 pupils and 21,579 teachers, and 377 collegiate institutions with an enrolment of 182,450 students taught by 4,034 professors. Total enrolment was 4,985,450.

Finance.—The basic monetary unit is the peso, divided into 100 centavos, with exchange selling and buying rates held very close to the par value of 2 pesos to the U.S. dollar by government action. In July 1956 the internal purchasing power of the peso stood at 0.3305, against a 1941 base of 1, with the cost of living standing at 302.6 against a 1941 base of 100. On June 30, 1956, there were 75 banks in operation, and total bank resources were \$892,600,000. Currency in circulation increased slightly to \$337,500,000 as of June 30, 1956. Foreign exchange reserves dropped slightly during the year to \$233,800,000. The national debt rose somewhat to \$757,480,000.

The national expense budget for 1956-57 was passed by congress at \$615,000,000.

With government revenues estimated at \$479,000,000, an expanded pattern of deficit financing was required to provide for the basic development programs in agriculture, power, transport and communications which were a key element in the president's program. National income for the calendar year 1955 was estimated at \$3,902,000,000, the highest figure yet attained and a modest increase from the 1954 total.

Communications.—Railroad mileage operative in early 1956 was 690, freight carried was 1,352,000 tons for the year 1955, and passengers carried numbered 8,464,000 for the year. Highways totalled 19,550 mi. at the end of 1955, with 118,000 licensed motor vehicles, about equally divided between cars and trucks-buses. There were 56,300 telephones at the end of 1955 and 18,000 mi. of wire lines along 4,880 mi. of pole lines in the telegraph system. Forty-six radio broadcasting stations were listened to through an estimated 415,000 radio sets.

Trade.—The total export trade of the islands in the calendar year 1955 totalled \$419,255,000. The ranking items comprised copra \$120,960,000, sugar \$103,900,000, minerals and metals \$49,340,000, logs, lumber and timber \$44,000,000, abacá \$27,770,000, coconut oil \$16,100,000, desiccated coconut \$12,050,000, embroideries \$10,900,000, pineapple \$5,500,000, copra meal and cake \$4,240,000, the above categories amounting to almost 95% of the total export value. The import trade totalled \$536,340,000, resulting in another unfavourable balance. The ranking items were textiles \$135,320,000, petroleum products \$53,830,000, machinery \$52,170,000, electrical products \$42,845,000, metal manufactures \$39,140,000, transport equipment \$38,050,000, grains and products \$35,110,000, dairy products \$27,180,000, paper and products \$33,630,000, chemicals and drugs \$22,380,000, the above categories amounting to 87% of the total import volume. During the year the United States took 59.6% of Philippine exports and supplied 65% of its imports. Japan took 15.2% of the exports and supplied 7.9% of the imports.

Agriculture.—Land cropped during the 1955-56 crop year amounted to 16,000,000 ac. Rice harvested totalled only 6,560,000 ac., significantly less than during the previous year, partly because of poor weather conditions. Maize totalled 3,450,000 ac., coconuts 2,445,000 ac., fruits and nuts 833,000 ac., root crops 675,000 ac., sugar cane 662,000 ac. and abacá 538,000 ac. The index of agricultural production reached 126 against a 1952 base of 100. Livestock figures on Dec. 31, 1955, indicated water buffalo 3,109,000, cattle 824,000, goats 423,000, horses 233,000, sheep 22,400, pigs 5,700,000 and chickens 47,577,000. An estimate indicated 5,900,000 persons directly employed in agriculture, producing \$1,638,000,000 in national income.

Manufacturing.—The manufacturing index increased to 143 against a 1952 base of 100. Total "factories" were 11,800, but detailed data were

unobtainable, though an estimate indicated 2,507,000 workmen were employed in all phases of manufacturing, and other data indicated \$1,482,000,000 in national income from all types of manufacturing.

Mining.—The index of mining production stood at 149.1 for 1955 against a 1949 base of 100. Data for the calendar year 1955 showed production of gold at 419,000 oz., silver 502,000 oz., copper 17,461 metric tons, manganese 11,912 metric tons, chromite 595,000 metric tons, iron ore 1,432,000 metric tons, coal 130,200 metric tons and lead 2,318 metric tons. (J. E. Sp.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*The Philippines* (1955).

Philology: see ARCHAEOLOGY.

Philosophy. The trends that had characterized philosophy activity since World War II continued throughout 1956 without important interruption or alteration. In the face of a continuing resurgence of metaphysical writing, there was the same strong positivistic inclination of those who tend to identify knowledge with *scientific* knowledge, whose distrust of metaphysics and speculation has given contemporary thought much of its distinctive quality. There was the same interest, nevertheless, in the re-examination of the foundations of moral philosophy in the hope of discovering some escape from the value relativism that denies the possibility of moral absolutes and insists that there can be no science of ethics. In particular, much attention was given to the nature of the moral judgment and its analysis from the standpoint of emotive language. There was the same increasing interest in religion as a personal, social and cultural phenomenon, while the subject matter of religion, its history and literature and the critical examination of its basic ideas had obviously achieved a secure academic acceptance in institutions of higher learning.

Existentialism, the European-born philosophy that takes its stand on the hard facts of the human predicament, if not still increasing in general popularity, was in 1956 quite certainly enjoying its newly achieved academic respectability and was exerting extensive influences on the intellectual life especially of western nations. The major work of the French existentialist Jean Paul Sartre was published in English translation by Hazel E. Barnes as *Being and Nothingness: an Essay on Phenomenological Ontology*. Partly as a result of the impact of existentialism, the year saw a continued increase in philosophical research and writing relating to psychoanalysis and depth psychology.

The perennial problem of the nature of time was treated from the standpoint of physical or "real" time in a posthumous publication of the German-American logician and philosopher of science Hans Reichenbach, *The Direction of Time*. Reichenbach's work was oriented in terms of recent developments in mechanics, thermodynamics, quantum theory and macrostatistics. A leading philosopher of science, the Harvard physicist P. W. Bridgman, added to his already impressive fund of philosophical stimulants his *Reflections of a Physicist*, a volume of essays concerned with such diverse themes as operational analysis, freedom, time, cosmic inquiry and the social responsibility of scientists. P. J. Chaudhury published *The Philosophy of Science* in Calcutta, India, which promised to be of special interest to occidentals as a leading eastern treatment of fundamental scientific concepts. A volume of essays by the Polish-American mathematician and logician Alfred Tarski was edited by J. H. Woodger with the title *Logic, Semantics, Mathematics: Papers from 1923 to 1938*. *Intuitionism* by A. Heyting of Amsterdam, Neth., dealt with intuitive proof in mathematics.

In the philosophy of religion, an outstanding event was the publication of the British philosopher H. J. Paton's Gifford lectures, *The Modern Predicament*, which were delivered earlier at the University of St. Andrews, Scot. Paton described the modern predicament as the need to reconcile religious belief and empirical knowledge. The German-American philosophical theologian Paul Tillich, who has through his existentialist theology

contributed greatly to the intellectual foundations of the current resurgence of biblical religion, published an extensive essay on *Biblical Religion and the Search for Ultimate Reality*. A source of considerable controversy, ethical and political as well as religious, was *Secularism Is the Will of God* by Horace M. Kallen, who has over many years been a vigorous and effective advocate of pragmatic humanism, both as an opponent of traditional theism and as a foundation for a democratic society. *Reinhold Niebuhr, His Religious, Social, and Political Thought*, edited by Charles W. Kegley and Robert W. Bretall, was an important document in contemporary philosophy, being a critical examination, by various authors, of the theology and social philosophy of an influential Protestant theologian and religious leader.

A major event in moral philosophy was the publication of the 1954 Woodbridge lectures by the celebrated American philosopher C. I. Lewis under the title *The Ground and Nature of the Right*. *Christian Ethics and Moral Philosophy* by George F. Thomas was a detailed analysis of the philosophical, theological and anthropological bases of the Christian concepts of virtue and moral right and duty. Herbert W. Schneider's *Three Dimensions of Public Morality* dealt with the interdependence of liberty, equality and fraternity.

The philosophy of history, given new life in recent decades by the work of Oswald Spengler and Arnold Toynbee, continued to arouse the interest of scholars and laymen, both in speculation on the nature and implications of large-scale historical processes and in critical analysis of the assumptions and methodological principles of historians themselves. The Gifford lectures of the German theologian Rudolf Bultmann, published as *History and Eschatology*, analyzed European thought on the nature of history from the viewpoint of fundamental Christian concepts. In England Geoffrey Barraclough's *History in a Changing World* was a critical commentary on the usual assumptions and methods in the treatment of history. The Dutch historian Pieter Geyl analyzed the historical perspectives of the present in his *Use and Abuse of History*.

Of quite special interest to those interested in fundamental, social and cultural issues was a report by Richard McKeon of the University of Chicago, published by *The Journal of Philosophy* in January, of round-table discussions conducted on the subject of "Human Relations and International Obligations." The discussions were held under the auspices of UNESCO (the United Nations Educational, Scientific and Cultural organization) in 1954 in India and in 1955 in the United States.

Among important works in metaphysics, concerned with the theory of reality and the analysis of the most fundamental assumptions in thought, was *The Structure of Metaphysics* by Morris Lazerowitz. In opposition to the general trend toward fragmentation in the treatment of philosophic problems, as well as to the multiplication of specialized movements, was Morton White's *Toward Reunion in Philosophy*, treating metaphysical, ethical and logical issues. Analytical philosophy, which has for several decades flourished especially in Great Britain, was given a generous expression in *Essays in Conceptual Analysis*, edited

Antony Flew. Indicative of a growing concern for the aims of education, the *Harvard Educational Review* published a symposium on the philosophy of education which presented the views of a large number of leading U.S. philosophers on current fundamental issues in educational theory and practice.

An important contribution to the literature of the history of philosophy was *The Philosophy of Jonathan Edwards*, edited by Harvey G. Townsend, which presented important and previously unpublished material from the notebooks of the greatest of America's colonial philosophers. Marking the centennial anniversary of America's foremost metaphysician, Josiah Royce, *The Journal of Philosophy* published a memorial issue of several ana-

lytical essays on Royce's philosophy. A major contribution to intellectual history was *Faith, Trinity, Incarnation*, vol. i of *The Philosophy of the Church Fathers* by the distinguished Harvard scholar, Harry A. Wolfson, dealing with the early philosophers of the Christian church and the relevance to their thought of Aristotelian, Stoic, Neoplatonic and Gnostic ideas. Vol. v of the monumental *History of Indian Philosophy* by the Hindu philosopher S. Dasgupta dealt with the schools of Saivism of southern India. *Plato's Philosophy of Mathematics* by Anders Wedberg made its appearance in Stockholm, Sweden.

Of interest especially to scholars was the announcement by the International Institute of Philosophy of an international *Bibliography of Philosophy*, a quarterly bulletin to be published in Paris with its content beginning Jan. 1954. *The Bibliographia Philosophica 1934-1945*, edited in two volumes by G. A. DeBrie, was published in Utrecht, Neth., under a grant from UNESCO, presenting an exhaustive bibliography for the history of philosophy and philosophical literature in all its branches. The first 4 volumes of a projected monumental philosophical anthology of 15 volumes had been published in Milan, It., under the editorship of Carlo Margorati, with the general title *Grande antologia filosofica*.

Among new philosophical publications were *Zeitschrift für Mathematische Logik und Grundlagen der Mathematik*, an international journal of mathematical logic.

The fourth Inter-American Congress of Philosophy and the first Congress of the Inter-American Federation of Philosophical Societies were held in July in Santiago, Chile, the sessions being directed to the theme, "Philosophy in the Contemporary World." The third International Congress of Aesthetics convened in Venice, It., in September. (S. M. Mc.)

Phosphates: see MINERAL AND METAL PRODUCTION AND PRICES.

Photography. Photography continued its steady progress through 1956 with important refinements in products and processes. There were no basic innovations, but many improvements and production of the basic products kept the industry and photographers active.

All the major manufacturers reported increased 1956 sales over the previous year, ranging from about 3% to 12%. The Eastman Kodak company's sales total of \$325,110,431 during the first half of 1956 represented a 2.9% increase over the same period in 1955. The Polaroid corporation reported a 12% gain in sales for 1955 over 1954, with a sales figure of \$26,420,723. The photographic sales increase during the first half of 1956 averaged close to a 7% gain over the same 1955 period in the United States.

Germany and Japan were the principal producers of photographic products outside the United States. Japan produced 1,071,600 still picture cameras in 1955, an increase of 9.2% over 1954. Approximately 40% of all Japanese photographic production was exported; 57.5% of this was sold to the U.S. military forces and foreign travellers in Japan; 21.1%, valued at \$2,090,015 in 1955, went directly to the United States, 2.8% to Canada and the balance scattered to other countries. During the first nine months of 1955 west Germany produced 2,425,886 still cameras, about 10% more than during the comparable period of the previous year, and exported 1,861,109 still picture cameras during the first 11 months of 1955, or an increase of 8.2% over the same 1954 period.

The west German photographic industry accounted for 69% of the U.S. photographic imports in dollar volume during 1955. A total of 1,274,591 still cameras valued at more than \$37,337,000 were imported into the U.S. from all sources during 1955.

Still picture photographic goods amounted to \$41,831,922 in exports from the United States during 1955, more than 15% higher than 1954. A survey showed that the 35-mm. camera was far ahead as the best seller in retail stores in the U.S.; approximately 60% of all colour film sales were for 35-mm. cameras.

Sensitized Products.—Films continued to appear in various forms and sensitivities. Eastman Kodak company produced improved emulsions for their Panatomic-X and Plus-X films that were claimed to be faster and finer-grained. There was a better dispersion of silver in the emulsions, and as a result less scattering of light by the silver grains to give more sharply defined shadow and high-light areas. The new Panatomic-X emulsion with an ASA daylight rating of 25 gives extremely fine grain and greater exposure latitude. The 35-mm. Plus-X film has an ASA daylight rating of 80.

Film manufacturers in 1956 made special efforts to cater to the users of miniature cameras. There was a continued demand for the finest-grained films, such as Adox and Panatomic-X, to the ultra-speed emulsions such as Tri-X. In line with the demand for high speeds, du Pont SX Pan roll film was available in 35-mm. and 70-mm. and other professional roll sizes. It had an exposure index of 320 daylight, relatively fine grain and a panchromatic emulsion with high red sensitivity. Effective exposure indexes of 1,000 and greater were possible with extended development to make this film ideal for existing-light photography.

Toward the end of the year du Pont Superior 4 Panchromatic motion-picture film was available in 16 mm. and 35 mm. with an exposure index of 320 daylight and 250 artificial light. This film was recommended for use in situations calling for a minimum of illumination, as in recording data from instrument dials in jet and rocket propulsion testing. This new film has good resolution and minimum grain for a fast emulsion.

Du Pont 834 TV recording film for 16-mm. and 35-mm. kinescope recording and also for economical reversal duplicating uses was available in Sept. 1956. Its speed permitted sharper TV recordings through a reduction of kinescope tube intensity. An orthochromatic Kodak Gravure Copy film was introduced for making continuous-tone copy negatives.

Kodak Royal Ortho film was an important introduction for the fields of industrial, portrait and commercial photography. With a daylight exposure index of 200, this film was intended to widen the possibilities of an orthochromatic film with high speed. Kodak Verichrome Pan was another new film, replacing the well-

known orthochromatic Verichrome film that was first introduced in 1931. The new Verichrome Pan has the advantage of being panchromatic and faster, thus extending the range of picture-taking possibilities for the former users of Verichrome. Verichrome Pan has a daylight exposure index of 80.

Polaroid Land Projection film, with an exposure index rating of 1,000, opened the way for many new photographic uses. With the Land 60-second camera, finished pictures on transparent film could be made ready for projection in one minute. The extremely fast emulsion permits exposures in poorly illuminated places without additional booster lights. Still another advantage was the possibility of using the smallest apertures in the camera shutter to get a maximum depth of field and sharpness in the picture. This is of special importance when projected onto a large screen.

Eastman Television Recording Safety film, available in 16 mm. and 35 mm., has greater definition and speed, improved gray scale and a spectral characteristic suitable for improved TV recording purposes.

Colour Photography.—Few really new products for colour photography appeared in 1956; most of the new materials which became available were additional types of basic processes which first appeared in 1955.

The new Ektachrome process E-2 film which was introduced in 1955 later became available in a variety of sizes and colour balance characteristics. Originally offered in 35-mm. size and daylight balance only, this film was recently offered in a new tungsten balance, type F, adjusted for a light quality of 3,800° K. corresponding to flash lamp illumination. Also made available were several roll film sizes in both daylight and type F sensitivity.

As a result of a consent decree signed by the Eastman Kodak company, the firm ceased to offer Kodachrome film with the cost of processing included in the purchase price. In addition, Kodak made available processing information and equipment so that independent firms could undertake to process Kodachrome film. The user was given the option of specifying either Kodak or independent processing when sending film to a dealer for processing.

Coincident with this change in processing, Kodachrome film was offered in 35-mm. miniature camera rolls in three types of sensitizing—daylight, type A (for 3,400° K. illumination) and type F (for 3,800° K. illumination). As 16-mm. and 8-mm. motion-picture films, it was available in daylight and type A sensitizing only.

A new Kodachrome Duplicating film for 16-mm. motion pictures was introduced in 1956. This type of film has unusual construction in that it carries a reversal colour image and a negative-positive sound track. Thus, unlike previous 16-mm. colour print films, in which the original image to be copied must be a positive both for picture and sound track, this film requires a positive picture and a negative sound track for printing. The final film contains a dye image in the picture area and a silver image sound track for optimum quality in each.

Anso, having made the first Anscochrome high-speed colour film available in 1955, added a variety of sizes and sensitivity types during 1956. This high-speed colour film was available in 35-mm. miniature film in daylight and flash type (for light of 3,800° K. quality). Both types were also offered in standard roll film sizes. Professional sheet films were available in daylight and tungsten (3,200° K.) balance, and 16-mm. motion-picture films in daylight and tungsten (3,400° K.) emulsions.

Colour Negative Films.—Several new colour negative films were introduced by Kodak during 1956. The new Kodacolor type CU appeared to be the first colour film available that was not specifically balanced for a single light source. The emulsion of this film has sufficient latitude to allow exposure by either day-



SHELL X-RAY PHOTOGRAPH of the chambered nautilus showing the detail of the inner structures, one of a series prepared by a student technician at the University of North Carolina Memorial hospital. The photographs were awarded first prize at a 1956 radiological conference

light or clear flash (3,800° K.) illumination without compensating filters. By control of printing conditions, the resulting negatives can be printed on Kodak Color Print Material type C, and results in correctly balanced images regardless of the original light source used.

Late in 1956 a sheet film colour negative was offered to supplement the former Ektacolor Professional Film type B. The new film, known as Ektacolor type S and balanced for daylight, was specifically intended for short exposure work ($\frac{1}{25}$ second and shorter), thus making it useful for electronic flash exposures as well. It has a fairly high emulsion speed, daylight exposure index 25 and built-in colour correction masks, similar to those in all Eastman colour negative films.

Another Eastman negative colour film introduced in 1956 was the Eastman Color Internegative film in motion-picture sizes of 16 mm. and 35 mm. It was specifically intended for making colour negatives from positive colour originals, especially those made on Kodachrome Commercial film. The resulting "dupe" negative can then be printed on Eastman Colour Print film in either the 16-mm. or 35-mm. size.

Eastman Kodak company announced to the television industry information about an embossed or lenticular film suitable for colour TV recording. By means of either colour filter separation or electrical and geometrical separation, light representing red, green and blue is passed through small embossings or lenticles on the base side. The subject is recorded as adjacent, but separate, images on a black-and-white film emulsion. Conventional black-and-white film processing is used, and by additive projection a composite colour image can be created on a screen or on the TV system. Equipment for using this lenticular film was made by the Radio Corporation of America and installed in the new National Broadcasting company plant in Burbank, Calif., during the fall of 1956.

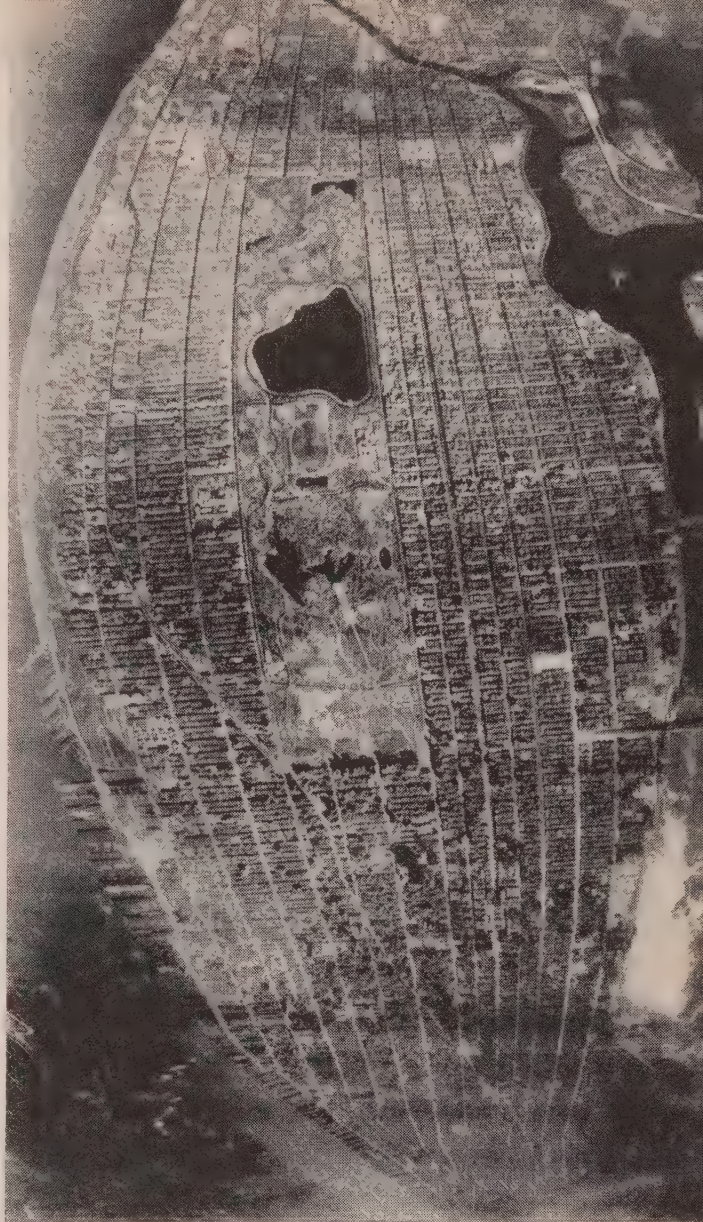
Lighting.—An improved peanut-size flash lamp, the Power-Mite M2, with a light output of 7,000 lumen seconds, was developed by General Electric; a new blue bulb of the same size was also available with 5,500 lumen seconds output.

Sylvania Electric Products Inc. developed a new light source, the RF lamp, powered by radio high-frequency energy. Originally developed to meet film printing problems, the new light also found applications in colour television, medical research and other uses where a concentrated light source is required.

General Electric introduced its new Low-Contour projection lamp to operate on its side for low-contour projectors. It operates at cooler temperatures and ensures a long projection life.

Motion-Picture Photography.—The Bell and Howell company introduced the first fully automatic movie camera, the model 200-EE 16-mm. magazine-loading camera. An electric eye automatically adjusts the lens iris to varying indoor or outdoor light conditions to maintain perfect exposure, even for pictures of an object moving from light into shadow. A warning flag in the view finder signals when the light is not sufficient for good movies. Current for the photoelectric cell and the motor that moves the iris is supplied by six tiny mercury cell batteries that have a life of one year or more. The 200-EE has a 20-mm. f/1.9 lens in a focusing mount, accessory telephoto and wide-angle lens attachments. All the photographer must do is focus and press the shutter release to start the camera operation.

Bell and Howell also produced the 16-mm. model 70-DR with a coupled view finder and lens turret. When rotating the lens turret each corresponding view finder objective is automatically repositioned, eliminating the possibility of a user's forgetting to rotate the view finder when changing lenses. This firm also introduced the 16-mm. model 200-S Auto Load camera with Sunomatic lens. The lens is set according to a written plate on the camera indicating the outdoor lighting such as: bright sun, hazy



MANHATTAN ISLAND seen from three miles up, a photograph taken from a U.S. military reconnaissance plane in 1956

sun, light shade, cloudy dull or very dull.

The Cine-Kodak K-100 Turret camera was introduced, featuring three Kodak Ektar lenses together with matching view finder lenses on the same turret. As each lens is turned into position the appropriate view finder lens automatically moves into place. The camera can be loaded with 50- or 100-ft. rolls of 16-mm. film. A new line of Kodak 8-mm. Brownie movie cameras was available with various combinations of lenses.

A new model 16-mm. motion-picture projector, the Kodascope Analyst II, permits detailed study of films at speeds ranging from 5 to 24 frames per second. This projector facilitates specialized analysis of athletic films and enables industry to carry on more detailed motion and methods studies. Kodak also introduced a new Brownie 8-mm. movie projector with 500-watt lamp and improved 16-mm. Kodascope Pageant sound projectors.

Bell and Howell also had a number of new 8-mm. and 16-mm. motion-picture projectors. The Filmosound Specialist gave increased sound volume and distribution for large audiences. A 1,000-watt concentrated filament lamp is used. There was also the new 18-mm. Filmosound 385 with increased volume and a 1,000-watt projection lamp. The Filmosound 302 16-mm. optical-magnetic recording projector was of interest to amateur movie

makers, business, industry and schools for making low-cost sound movies by recording voice and music directly on the striped film as it is projected on the screen.

Bell and Howell developed a new fully automatic 2-by-2-inch slide projector known as the TDC-Robomatic. The projector, operated by remote control or manually either in forward or reverse, would show 30 slides at intervals ranging from 5 seconds to $1\frac{1}{2}$ minutes according to the setting.

(See also ELECTRONICS; MOTION PICTURES.) (W. D. MN.)

Physics. Further information was gained during 1956 about the antiproton, and confirmatory studies established the existence of the neutrino. There was continued effort and interest in the construction of the large accelerators with which particles may be carried to high energies.

The barrier between Soviet physicists and those of the western countries showed signs of disappearing. A conference on nuclear physics was held in Moscow in May, with many physicists from the United States and western Europe in attendance, and there was praise from western scientists for the high level of Soviet scientific work and equipment. A group of physicists from the U.S.S.R. participated in an international conference on high-energy accelerators at the University of Geneva, Switz., in June, and in April three Soviet nuclear physicists took part in the annual high-energy physics conference of the University of Rochester, N.Y.

Discussions continued on the effects on mankind of radioactive debris from nuclear explosions. A report issued in June by the National Academy of Sciences of the United States emphasized the damaging genetic effects of accumulated exposure to radiation, but stated that nuclear weapons tests had not yet created any world-wide radioactivity hazard. There were differences of opinion on the effects of nuclear explosions, since geneticists pointed out that any increase in radiation levels is genetically undesirable. The Federation of American Scientists, in June, urged the United States government "to declare publicly its support for a world-wide ban on further tests of nuclear weapons."

In the United States and in Great Britain there were insufficient physicists for the available openings in research and teaching. The number of secondary school teachers of physics was notably inadequate, and also in the United States many small liberal arts and teachers' colleges were not able to appoint adequately trained physics instructors to their staffs.

Antiproton and Neutrino.—Artificial production of antiprotons (particles of the same mass as the proton, but with a negative charge equal in magnitude to the positive charge of the proton) had been achieved in the previous year at the University of California, Berkeley. The California group consisting of O. Chamberlain, E. Segre, C. Wiegand and T. Ypsilantis produced antiprotons on interaction of a proton beam from the Berkeley bevatron with the atomic nuclei of a copper target. A minimum beam energy of 4,200,000,000 ev was required for production; antiprotons appeared in increased number as the bevatron beam energy was increased to 6,200,000,000 ev.

During the year the California workers extended their antiproton work, and succeeded in making a quantitative measurement of the interaction cross section of antiprotons with matter. Roughly, the cross section is the effective geometric area which the particle presents to other particles in an interaction. Antiprotons, passing through a target, may interact either by being annihilated or by being scattered by atomic nuclei of the target. Measurements of interaction were made with an antiproton beam and targets of copper and beryllium. For both materials the antiproton interaction cross section was found to be twice that of the interaction cross section of protons, with an estimated experimental error of about 15% in the measurements. This result

could mean either that the antiproton presents a radius twice as large as that of the proton, or that the forces involved are such that atomic nuclei are effectively twice as large for antiprotons as for protons.

In 1953 C. L. Cowan, Jr., and F. Reines of the Los Alamos Scientific laboratory, N.M., had found evidence for the existence of the neutrino by studying the presumed neutrino flux coming from the Hanford, Wash., nuclear reactor. Their results were not, however, as free from experimental uncertainties as would be desired, and during 1956 they successfully carried out a new series of observations. The existence of the neutrino, which is a particle that carries energy and momentum but is without charge and virtually without mass, had been indirectly inferred from several lines of physical evidence.

Reines and Cowan, joined by F. B. Harrison, H. W. Kruse and A. D. McGuire, carried out their new experiments at the reactor of the Savannah River plant of the U.S. Atomic Energy commission. As before, they detected the neutrino by observing the positrons and neutrons produced by the interaction of neutrinos with protons. Their results clearly indicated that neutrinos were produced in the nuclear processes of the reactor, and all attempts to show the neutrino effects to be spurious tended to confirm the presence of neutrinos. The measurements indicated that the cross section of a neutrino for the interaction with a proton is of the order of 6×10^{-44} cm². Since most nuclear reactions have cross sections which are about 10^{20} times larger, it is apparent why the neutrino is so relatively difficult to observe by means of an interaction.

Accelerators.—Work in high-energy physics continued to be perhaps the central theme of contemporary physics.

There was strong interest in pushing upward the energies of accelerators, so as to give greater possibilities for exploring the production and interaction properties of elementary particles. In the United States, plans were announced for a 3,000,000,000-v. proton accelerator at the Forrestal Research centre of Princeton university, and for a 6,000,000,000-v. electron accelerator to be constructed jointly by Harvard university and the Massachusetts Institute of Technology. These accelerators would compare in energy with the bevatron accelerator at the University of California and the cosmotron of the Brookhaven National laboratory, Upton, N.Y. An accelerator that would carry particles to 25,000,000,000 v. was under design at the Brookhaven laboratory. The Argonne National laboratory, Lemont, Ill., initiated planning for a 15,000,000,000-v. accelerator, and the Mid-West Universities Research association (M.U.R.A.) worked on problems associated with constructing an accelerator that would give particles of at least 25,000,000,000 ev of energy. In the U.S.S.R. a 10,000,000,000-v. accelerator was nearing completion, at a laboratory near Moscow, and plans were being made for an accelerator in the 50,000,000,000- to 60,000,000,000-v. range. The European Organization for Nuclear Research (C.E.R.N.) began construction of a 25,000,000,000-v. accelerator at Geneva, Switz.

The M.U.R.A. design group considered an interesting new possibility in their accelerator plans. Customarily, bombarding particles from an accelerator strike target material which is at rest in the laboratory. If, however, both the target nuclei and the bombarding nuclei could be accelerated and then be brought to collision from opposite directions, there would be a large gain in the interaction energy effective for the creation of new particles. Such a "head-on" collision of two beams of particles would require high beam intensities, and the number of interactions per unit of time would in any event be far less than when the bombarding beam strikes the dense concentration of nuclei in a target block of solid matter. The two beams might be produced in two distinct accelerators. But the novel proposal was also made that particles after being accelerated to their ter-

minal energy be "stored" momentarily by being placed in a magnetic field where they would move in a closed orbit without loss of energy; pulses of particles from a single accelerator could be stored in two magnetic fields, with motions in opposite senses in the two fields, and then be deflected into collision paths.

Controlled Fusion Reactions.—The hydrogen bomb involves the bringing together of nuclei of light atoms, as hydrogen, helium or lithium, with resultant formation of heavier atoms and immense energy release. Such a fusion reaction will occur only at extremely high temperatures, of many millions of degrees; in the hydrogen bomb an "ordinary" uranium fission bomb is used as a trigger that raises the hydrogen bomb temperature to the point where fusion ("thermonuclear") processes will begin.

The problem of setting up a controlled thermonuclear reaction which will give usable power is clearly a difficult one, since a reaction must be maintained at temperatures at which any ordinary chemical material will be completely destroyed. Two statements made during the year, and reported in the Sept. 1956 issue of the *Bulletin of Atomic Scientists*, described an approach to the problem that was being followed in the United States and in the Soviet Union. These statements were made by the U.S. physicist Edward Teller, at a Physical society meeting in Chicago in June, and by the Soviet physicist Igor Kurchatov, at Harwell, Eng., in May. The essential idea in the approach is to confine the very hot gas, in which fusion should occur, within a "magnetic bottle." At the temperature of fusion processes the atomic nuclei have been stripped of their electrons, and are therefore positively charged particles, moving very rapidly. Any charged particle moving through a magnetic field is deflected in a curved path, the degree of curvature being proportional to the strength of the field for a given particle velocity.

With an immensely strong field it might therefore be possible to confine the hot plasma, as the gas of charged particles is called, within a prescribed spatial region, with fusion reactions and energy releases occurring in that region.

Negative Temperatures.—During the past few years the concept of negative temperature had been developed. N. F. Ramsey of Harvard university, who took a leading part in the introduction of this concept, published a summary paper on it in the *Physical Review* for July 1, 1956.

The ordinary temperature scale of physics runs from absolute zero, at which temperature all molecular and atomic motion effectively ceases, to temperatures of unlimited magnitude. Roughly speaking, the more energy that is given to the atoms of a system the higher is the temperature of the system. There are some specialized systems, however, in which there is an upper limit to the energy which can be given to the elements of the system, and for these systems states of negative temperature may occur.

Physicists have long referred to the degree of order among the elements of a system in terms of the "entropy" of the system; high degree of order means low entropy, increasing disorder means increasing entropy. (Checkers in regular array on a board have relatively low entropy, checkers scattered at random on a board have relatively high entropy.) Increased energy put into a system usually increases the disorder, and hence the entropy, of the system.

Quantitatively, the energy increment multiplied by the temperature at which the energy is given to the system is the entropy increase.

Suppose now that a system has a maximum degree of order (and zero entropy) at a base temperature. With increase in energy, disorder and entropy would increase for most systems; but for those unusual systems for which there is an upper energy limit energy increase may eventually bring entropy decrease, until

at the upper energy limit the system again has maximum order and zero entropy. Since entropy change is temperature multiplied by energy increment, the system must be at a negative temperature when it is in a state such that addition of energy gives a decrease of entropy.

The atomic nuclei of a crystal may form a system which can go into negative temperature states. These nuclei interact among themselves, and they may take up various spatial positions with respect to an external magnetic field. If all the nuclei have the orientation which corresponds to minimum energy, with respect to an external magnetic field, the system of interacting nuclei is completely ordered and at zero entropy; if energy is then given to the system until all the nuclei take up the orientation which corresponds to maximum energy, there again is complete ordering and zero entropy. At some intermediate state of disorder the system had maximum entropy, and it proceeded from that state to the one of maximum energy and zero entropy by being in states of negative temperature.

Some novel properties were predicted for systems when physical equations were applied, with negative values for the temperature. Ramsey and his colleagues, R. V. Pound and E. M. Purcell, as well as workers at a few other laboratories, experimentally studied systems of interacting nuclei in crystals at negative temperatures, and observed the expected properties. If a system is at a negative temperature of, for example, -100° , heat will flow from it to a system at -200° . That is, the lower the negative temperature, the colder the body, since heat flows from hot to cold. But also, heat will flow from a system at negative temperatures to a system at any positive temperature. Negative temperatures therefore must be taken to be hotter than positive temperatures.

States of negative temperature are clearly impossible for most physical systems, but the existence of special systems for which such states do exist gives a significant addition to the temperature concept.

(See also ATOMIC ENERGY; ELECTRONICS; INTERNATIONAL GEOPHYSICAL YEAR, 1957-58; METEOROLOGY.) (Rt. Sl.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Atomic Energy* (1947); *Atomic Radiation* (1953); *Electrons* (1937); *Fundamentals of Acoustics*, 2nd ed. (1950); *Laws of Motion* (1952); *Sound Waves and Their Sources*, 2nd ed. (1950).

Physiology. Serotonin.—Certain biological effects that were later attributed to serotonin were first recognized in 1884. Subsequent work resulting in isolation of the material, its chemical identification and some suggestions as to its possible physiological role was completed in 1949. Following this period, intensive research, reaching a high level in 1956, demonstrated that this substance has an important physiological role, and disturbances in its metabolism (the manner in which the material is used or handled by the body) can result in serious disease.

Serotonin is normally found in many animal tissues, and is present in greatest amounts in intestinal mucosa, blood platelets and the brain. The substance is formed by the action of an enzyme, present in almost all cells, on a precursor (hydroxytryptophan). The cells of different tissues have the ability, to different degrees, of either binding free serotonin or releasing serotonin from its precursor.

The effects of serotonin, as observed on isolated organs and tissues and on the intact animal, are multiple. A rise or fall in blood pressure may be produced depending on the experimental circumstances; the smooth muscle of the intestine is strongly contracted; respiration is at first depressed and later increased. The effects are so numerous that the basic mode of action is not completely understood.

The physiological significance of this substance is likewise

not completely understood. Because of its action on the smooth muscle of blood vessels and of the intestine, the suggestion was that it is active in stopping haemorrhage from a wound or may play some part in the regulation of blood pressure. Likewise, the control or regulation of intestinal muscular activity may be another possible function. The common occurrence of serotonin in glands indicates a possible role in relation to glandular secretion. However, investigations carried out in 1954-56 suggested that one of serotonin's more important functions is that of a neuro-hormone; *i.e.*, a substance that is concerned in the functional activities of nerve cells.

This concept arose from the observations that a definite antagonism exists between serotonin and lysergic acid, that serotonin can block transmission of the nerve impulse across a ganglion and that it inhibits the activity of peripheral nerves.

The antagonism between lysergic acid and serotonin was a recent demonstration and was important because of its possible relationship to mental disease.

Lysergic acid is a material which is obtained from ergot; it may also be produced, possibly, at some sites in the living organism. When administered in extremely small doses to human beings it produces the symptoms of a psychosis that almost exactly resembles the common mental disease schizophrenia. The interest in this observation lies in the fact that lysergic acid and serotonin have similarities in their chemical structure and also that lysergic acid in small amounts will antagonize the effects of serotonin on a test tissue such as the rat uterus. Since serotonin is normally present in brain cells, it is assumed that it has some normal role in the metabolism of the brain cell. Since lysergic acid has some chemical similarities to serotonin, it was suggested, as a working theory, that it is taken into the cell by some part of an intracellular enzyme system. Then, because it is not exactly the same chemically as serotonin, it blocks the normal utilization of serotonin by the cell. Thus the normal function of the cell is disturbed. In the case of the brain this results in a psychosis. This theory may assume that in these psychotic states lysergic acid or a similar substance is produced somewhere in the body as the result of some abnormal metabolic process. As Gaddum stated, "It is possible that serotonin in our brains plays an essential part in keeping us sane and that the effect of lysergic acid is due to its inhibitory action on serotonin in the brain."

This point of view was strengthened by the current idea as to the mechanism of action of some of the tranquillizing drugs such as Reserpine. This new drug had had excellent success in the treatment of several mental diseases including schizophrenia. It was shown that Reserpine, when given to an animal, brings about a release of "bound" serotonin in all tissues. Such "bound" serotonin is not free to exert its normal physiological effect. It was postulated that lysergic acid or a similar chemical substance may act to bind serotonin and that Reserpine acts to free or liberate it and relieve the psychotic state.

It was stated above that serotonin might have a role in the regulation of blood pressure. Some investigators suggested that some forms of hypertension may be the result of an increased serotonin activity. They therefore prepared several compounds similar in chemical structure to serotonin but differing from it in some slight fashion. They hoped to find a compound which would compete with serotonin in the cells of the smooth muscle of the arteries as lysergic acid competes with serotonin in the brain. Several compounds were prepared. Some of these produced mental symptoms as did lysergic acid. However, one (1 benzyl-2,5 dimethylserotonin) prevented the blood pressure rise produced by serotonin but did not produce mental symptoms. A clinical trial of this substance in patients with high blood pressure was reported to have brought about a reduction in blood pressure.

Thus, another possible role of serotonin was suggested.

Regulation of Blood Cholesterol.—Cholesterol, although a normal constituent of the diet and of human tissues, is on occasion deposited in the inner lining of small blood vessels and thus slows or occludes the flow of blood through them. It is, therefore, concerned in high blood pressure, heart disease and probably some forms of kidney disease.

The nature of the diet has a definite influence on the metabolism of cholesterol. Thus in countries with high standards of living, where the diet includes much animal fats, butter, eggs, etc., the incidence of diseases involving the heart, blood vessels and kidneys is high. In population groups in which these more expensive dietary items have been absent, these diseases are relatively rare.

Since it is impossible to change the dietary habits of large groups of people, research was directed toward obtaining an understanding of cholesterol metabolism. Previous attempts to reduce high levels were low fat diets, thyroid hormone, vegetable sterols and large doses of female sex hormone. For various reasons these methods were not completely successful.

Recent human dietary experiments showed that the nature of the fat in the diet rather than total amount is the important factor resulting in high blood cholesterol levels and eventual deposition in vital tissues. Thus, a diet high in cholesterol and also in animal fat (containing mainly saturated fatty acids) caused elevation in blood cholesterol levels, whereas the same diet containing vegetable oils (mainly unsaturated fatty acids) did not cause such a rise.

This fact may also explain why those populations such as the Italians and Greeks, whose fat intake is largely of vegetable origin (olive oil), and the Japanese (fish oils) have low blood cholesterol and little cardiovascular disease.

Another recent observation pointed to a possible means of controlling the blood cholesterol in persons with elevated levels and thus preventing future artery disease. In a group of investigations an emulsion of fat was injected into veins of patients with high blood cholesterol levels (600 mg. %; normal 250 mg. %). The cholesterol fell during a seven-day period to a normal level. These results were unexpected and were being investigated further.

Another group of investigators was able to reduce significantly the blood cholesterol level in patients with elevated levels by giving large doses of nicotinic acid over a period of 12 weeks. Nicotinic acid is one of the B-complex vitamins normally needed to prevent pellagra. The amounts used in this investigation, however, were much in excess of the normal nutritional needs.

Synthesis of a Pituitary Hormone.—An important phase of physiology is the nature of regulation of bodily function by the secretion of the endocrine glands.

This area of knowledge is always greatly broadened when the secretion of an endocrine gland is precisely identified chemically and especially when it becomes possible to synthesize it.

Extracts of the posterior pituitary gland have yielded two active hormonal fractions. One, oxytocin, caused contraction of the smooth muscle of the uterus. The other, vasopressin, caused contraction of the smooth muscle of the small blood vessels. This fraction also has the ability to regulate, by reducing the volume, the output of urine by the kidney. The latter effect is the only established physiological function of the posterior pituitary hormones.

Oxytocin had been synthesized some time previously. Vasopressin was recently synthesized. Vasopressin, like oxytocin, consists of eight amino acids linked together in a series of ring structures. Six of the amino acids in oxytocin were identical with those in vasopressin. Vasopressin contained two different amino acids.

The synthetic hormone was found to be identical in its physiological effects to the natural hormone. (R. C. I.)

ENCYCLOPEDIA BRITANNICA FILMS—*Body Defenses Against Disease* (1937); *Digestion of Foods* (1938); *Ears and Hearing* (1950); *Eyes and Their Care* (1941); *Heart and Circulation* (1937); *The Human Brain* (1955).

Pickersgill, John Whitney (1905–), Canadian politician and federal cabinet minister, was born on June 23 at Wyecombe, Ont. He was educated at the University of Manitoba and at Oxford and Paris universities. He was a lecturer in history at Wesley college, Manitoba, 1929–37. In 1937 he became third secretary in the department of external affairs, Ottawa, but was almost immediately attached to the office of Prime Minister William Lyon Mackenzie King. He was appointed private secretary to the secretary of state for external affairs, 1942, special assistant to the prime minister, 1945, clerk of the privy council and secretary to the cabinet, 1952. He was appointed secretary of state in June 1953 and in August that year was elected member of parliament for Bonavista-Twillingate, Nfd. In 1954 he was appointed minister of citizenship and immigration.

In March 1956 Pickersgill delivered an important policy speech in Ottawa on the future of the Canadian Indians, pointing out that "today the Indian population of Canada without any immigration is increasing faster than the rest of the population with the very considerable addition resulting from immigration." "I do not believe that any Canadian should be fully satisfied with our Indian policy until the day comes when all the Indians . . . have been integrated with the rest of the population," he said, adding that Indians had been encouraged to seek enfranchisement.

Among important immigration activities he directed during 1956 were the liberalization of selection criteria applicable to immigrants, placing emphasis on suitability and adaptability of applicants rather than occupational skill; and the extension of the assisted passage loan scheme to dependents of immigrants, to foster movement of family units and to facilitate reunion of families with heads of families already in Canada.

(M. L. S.)

Pig Iron: see IRON AND STEEL.

Pigs: see LIVESTOCK.

Pineapples: see FRUIT.

Pipelines: see FEDERAL POWER COMMISSION.

Pittsburgh. Pittsburgh, Pa., voters approved the city's physical redevelopment program in 1956 by authorizing a \$30,000,000 bond issue as part of a \$43,000,000 program to assure rehabilitation of the city's water system, extensive street repaving and sewer reconstruction, extension of parks and recreation and other projects.

The eastern section of the Penn-Lincoln parkway was completed to within two miles of the Golden Triangle. With piers in place for a double-decked bridge over the Monongahela river, construction of a toll-free tunnel to carry Penn-Lincoln parkway traffic under Mt. Washington to the completed western section of the route was due to start early in 1957.

In Gateway Center, the Bell Telephone company began construction of an administration building, a state office building neared completion, construction of a \$15,000,000 Hilton hotel was assured and plans for a 750-car underground parking garage were projected by Equitable Life Assurance society.

Redevelopment of the populous Hill district, east of the central business district, was begun. The Urban Redevelopment authority began acquisition of 92 ac. and razing of 1,300 buildings to permit major street relocations and erection of a \$14,000,000

municipal auditorium, scheduled for completion in 1959. Construction advanced on an \$80,000,000 sewage disposal system.

The University of Pittsburgh purchased the contiguous 200-room Schenley Park hotel and the 238-family Schenley apartments for use as dormitories and as a student centre.

Manufacturing employment in the Pittsburgh district averaged less than 1% lower during the first eight months of 1956 than in the same period a year earlier and 2% lower than in the same period of 1954. Estimated total employment in the district was less than 1% above 1955 and 2% below 1954.

The Bureau of Business Research of the University of Pittsburgh estimated the value added by manufacturing in 1956 in the four-county Pittsburgh area to be about \$2,100,000,000 and the total value of products manufactured in the area to be about \$4,800,000,000.

Population (1950 census) was 676,806; area, 55.49 sq.mi. Local government total budgets: city, \$48,417,564; Pittsburgh school district, \$26,236,158; Allegheny county, \$39,499,983. City real estate tax rates were: land, 34 mills; buildings, 17 mills. The school tax rate was 13½ mills on all real estate; county, 9½. Assessed taxable real estate valuation in the city was \$1,115,996,148 and in Allegheny county, \$2,733,532,972. Bonded indebtedness as of Jan. 1, 1956, was: city, \$47,292,300; school district, \$12,106,000; Allegheny county, \$100,390,000. Enrolment in public schools was 75,624; in Catholic parochial schools, 47,388. David L. Lawrence served his 11th successive year as mayor of Pittsburgh.

(C. F. Ls.)

Pius XII (1876–), the 262nd successor of St. Peter in the see of Rome, was elected by the cardinals in conclave on his 63rd birthday, March 2, 1939, and was crowned as pope on March 12. (See ENCYCLOPEDIA BRITANNICA.)

Happily recovered from the grave illness he had suffered during 1954, Pope Pius XII broadcast his Christmas message from the Vatican on Dec. 24, 1955. In recent years, the pope had repeatedly warned humanity of the dangers to which the armaments race could lead. In his Christmas message, the pope went further and indicated three measures that should be taken to avoid disaster. The three points, avowedly parallel to proposals made in the United Nations, were: cessation of atomic weapon experimentations, renunciation of the use of atomic weapons and general inspection and control of atomic energy. The "sum total" of these measures, said the pope, is "an obligation in conscience of nations and of their leaders."

On March 2, 1956, Pius XII celebrated his 80th birthday and the 17th anniversary of his election to the papacy. When the erect and vigorous figure of the pope appeared at a window of the Vatican palace to impart his blessing, he received the respectful and affectionate homage of the faithful kneeling by the thousands on the cobbles of St. Peter square. Two days later, in the course of an audience for the diplomats of the 45 nations accredited to the Holy See, the pope said that the real hope for peace lies in the recognition that "man is first of all a spirit created in the image of God" with the right of self-rule and the right of family, property, a livelihood and local and national security. He added that a spirit of self-sacrifice rather than of selfishness and a willingness to accept arbitration and compromise rather than to stand on unreasonably obstinate positions, are also necessary for men and nations if peace is to be achieved.

On April 1 in his Easter message given before the tens of thousands again massed in St. Peter square, Pius XII once more warned of the dangers toward which mankind is hurtling. He asked for light and strength from the risen Saviour of mankind "for those who control the destinies of nations."

The deep concern felt by the pope for the tragic events in eastern Europe and the dangerous situation prevailing in the

middle east found expression in three encyclicals issued within ten days. On Oct. 28 he called on the Catholic world to pray for peace "based on justice," to end "so much shedding of blood" in eastern Europe and especially in Hungary. On Nov. 1 he repeated his call to the nations to be cautious of venturing "onto the steep slope of violence." Then four days later Pope Pius XII, moved by the cruel repression taking place in Hungary, declared: "We who look in a fatherly spirit on all peoples, must solemnly state that every violence, every unjust bloodshed, from wherever it comes, is always illicit."

(See also ROMAN CATHOLIC CHURCH; VATICAN CITY STATE.)

(J. LAF.)

Planned Parenthood: see BIRTH CONTROL.

Plastics. Unrevised totals for 1954 and 1955 production of plastics and synthetic resins in the U.S. are given in the table.

Production of Plastics and Synthetic Resins in the U.S.

(in pounds)

	1955	1954
Cellulose plastics (all)*†	144,750,000	123,200,000
Phenolic and other tar acid resins * ‡	505,560,000	396,000,000
Urea and melamine‡	312,900,000	253,350,000
Styrene and styrene-derivative polymer and copolymer resins*	610,230,000	501,000,000
Vinyl resins	701,660,000	516,800,000
Polyester resins	55,040,000	||
Miscellaneous§	816,730,000	539,150,000

*Includes fillers, plasticizers and extenders.

†Includes sheets, rods, tubes and moulding and extrusion materials.

‡All dry resin except moulding material which includes filler.

§Includes polyethylene, acrylic, nylon, silicone and other resinous moulding materials (including fillers, plasticizers and extenders), as well as petroleum and coumarone-indene resins, miscellaneous protective-coating resins and resins for all other uses.

||Not reported for 1954.

Source: U.S. Tariff Commission.

New, improved plastics materials, especially those in the polyethylene field, continued to dominate developments in plastics in 1956, particularly in the research work done on "stereospecific" plastics. In contrast with conventional methods for producing plastics, the stereospecific method uses organochemical catalysts as the principal tools more or less to replace high pressure in the polymerizing process. With this technique, it was claimed that polymers could be arranged in a predetermined geometric form rather than in random fashion, and consequently plastics could be made to develop properties needed for a specific application. The low-pressure polyethylenes introduced in 1955 were examples of this type of plastic. In 1956 the introduction of polypropylene, which was claimed to have properties similar to those of polyethylene but with greater stiffness and heat-resistant properties (melting point was reported to be 320° F.), was the immediate result of the year's research into the stereospecifics.

Considerable potential was predicted for nylon-6, a new material based on caprolactam monomer and introduced into the U.S. from Europe in 1956. Nylon-6 is a softer material than the conventional nylon-6/6, and since it has a lower melting point and a broader working temperature range it was claimed to be more adaptable to the production of parts with large surface area and thick cross section. In Europe it had already been successfully moulded into large carrying cans, gears, helmets, etc., and extruded into pipe, tubing and film.

Polyester film continued to broaden its market areas in both industrial and consumer use. One particularly successful application in 1956 was a polyester film-polyethylene film lamination used for packaging frozen precooked foods. To prepare the food, the entire package is simply dropped into a pot of boiling water.

Foamed plastics advanced considerably in 1956. It was estimated that during the year, about 1,500,000 lb. of urethane foam was being used monthly for such applications as rug underlay, crash padding, furniture padding, deep cushioning, shoulder pads,



PLASTIC GROUND COVER, a gardening development of 1956. After ground has been spaded and prepared the plastic sheet is rolled as shown in large photograph. Slits are cut for individual plants (inset), the balance of the sheet serving to eliminate the growth of weeds and to conserve moisture in the soil

hospital padding and sponges. Foamed vinyl also was used more widely as foam upholstery, sponges, automobile sun visors, seating and fashion accessories. Styrene foam found its principal use as insulation in building and refrigerator design. One of the newer foamed plastics introduced in 1956 was an expandable polyethylene for electrical insulation, soundproofing and various other applications.

Activities also centred on composite plastics sandwich materials—a multilayered laminate formed by bonding reinforced plastics or styrene sheet facing to a thick, lightweight, foamed plastics core. One large outlet for the sandwich materials was in the fabrication of lightweight, insulating truck bodies; another was in the design of a new type of refrigerator formed by notching a plank of the sandwich material and then folding the plank like a cardboard carton at the notched V-joints around previously subassembled interior partitions.

(See also CHEMISTRY.)

(C. A. BN.)

Platinum: see MINERAL AND METAL PRODUCTION AND PRICES.

Plums: see FRUIT.

Plutonium: see ATOMIC ENERGY.

Pneumonia: see RESPIRATORY DISEASES.

Poetry: see AMERICAN LITERATURE; CANADIAN LITERATURE; ENGLISH LITERATURE; FRENCH LITERATURE; GERMAN LITERATURE; JEWISH LITERATURE; LATIN-AMERICAN LITERATURE; LITERARY PRIZES; RUSSIAN LITERATURE; SPANISH LITERATURE.

Poland. A people's republic of eastern Europe, Poland is bounded east by the U.S.S.R., south by Czechoslovakia, west by Germany and north by the Baltic sea. Area:

120,442 sq.mi. Pop.: (1950 census) 24,976,926; (1956 est.) 27,680,000; national minorities (Germans, Jews, Byelorussians, Ukrainians, Lithuanians, Slovaks and Czechs) about 500,000. Language: Polish. Religion: Roman Catholic. Chief towns (pop., 1955 est.): Warsaw 965,000; Lodz 670,000; Wroclaw 490,000; Cracow 430,000; Poznan 370,000; Szczecin 300,000; Gdansk 280,000; Katowice 200,000; Bydgoszcz (1954 est.) 177,000; and 10 other towns with a population of more than 100,000. First secretaries of the Polish United Workers' (Communist) party in 1956: Boleslaw Bierut, Edward Ochab (from March 20) and Wladyslaw Gomulka (from Oct. 21). Chairman of the council of state, Aleksander Zawadzki. Chairman of the council of ministers, Jozef Cyrankiewicz.

History.—The year 1956 was one of great upheaval which some described as a victorious, bloodless revolution. What really happened could be summarized thus: Poland remained a people's democracy with the Communist party in control and was still an ally of the U.S.S.R., but the new rulers were Poles first and Communists second while the Russians or their Polish instruments were no longer in command in the administration, armed forces or national economy. The so-called democratization in the countries of the "camp of Socialism" had originally consisted in replacing one-man rule by that of a collective leadership by men willing to comply with orders from the Soviet Union. The failure of this process in Poland was explained first by the indomitable character of the Polish people and, second, by the fact that the "secret" speech delivered by N. S. Khrushchev to the 20th congress of the Communist party of the Soviet Union (Feb. 25, 1956) preceded by only two weeks the death of Bierut, the chief Polish Stalinist.

Bierut's death left the party leadership deeply divided. On March 20 the party's plenary session of the central committee unanimously elected Edward Ochab as its first secretary. It was believed that he was the candidate of Khrushchev, who arrived in Warsaw as head of a Soviet delegation to attend Bierut's funeral. Nevertheless, Ochab refused to be a Muscovite pawn and began carefully to prepare the return of Gomulka to the party leadership. On May 6 it was announced that Jakub Berman, a member of the Politburo and deputy premier, had resigned from both posts. With Bierut dead and Berman dismissed, of the original Communist triumvirate only Hilary Minc remained in the Politburo. But the influence of Cyrankiewicz, the premier, was growing and so was his closer partnership with Ochab.

The Poznan Revolt.—On June 28, 1956, an event of historic significance broke down the pretense of popular support for the Communist regime. Industrial workers of Poznan staged a general strike and a procession of 50,000 persons demanded bread, freedom, free elections and the departure of the Russians. Riots followed, a security police officer was lynched and order was restored the following day only by the army's use of tanks. According to official reports, 53 people were killed and 200 wounded.

Addressing the seventh plenary session of the central committee (July 18), Ochab admitted that the "soullessness of authorities" rather than the machinations of "imperialist agents" was a chief cause of the revolt. But N. A. Bulganin, the Soviet premier, alleged in Warsaw on July 21 that "foreign imperialist circles" were still trying to weaken the Socialist countries and detach them one from another, making use of certain political and economic difficulties in Poland. Such difficulties, he claimed, were only growing pains. It would be an error, nevertheless, not to see that the struggle against the personality cult was being exploited not only by "hostile and opportunist elements" but also by "wavering people in the Socialist ranks."

Three Groups in the Central Committee.—This lecturing was badly received by both the Polish public and the party rank

and file. The July plenary session of the central committee became a contest during which three trends became apparent, led by the Natolin group, the Realists and the Young Secretaries. The Natolin group, deriving its name from a country house near Warsaw where the Polish Communist élite offered hospitality to prominent foreign comrades, was represented by Zenon Nowak, Franciszek Mazur and Franciszek Jozwiak. They recommended strict censorship of the press and the curtailment of "democratization." The Natolin group was opposed by the younger generation of Communist leaders headed by Jerzy Albrect, Wladyslaw Matwin and Jerzy Morawski. They wanted "democratization" to continue. Between these two groups there were the Realists, led by Cyrankiewicz, Ochab and Zawadzki. They too were supporters of change, but desired to achieve it more slowly. But the only man who could restore party unity and authority and count on wider support was Gomulka. All three groups desired his return to the Politburo although it was clear that the Natolin group wanted him only as a figurehead. Such a role, however, did not appeal to Gomulka. He wanted to assume the party leadership, but he insisted on the dismissal of all Stalinists from key positions. Ochab continued to negotiate with Gomulka who on Aug. 5 was officially rehabilitated and restored as a party member. On Oct. 9 it was announced that Minc had resigned from the Politburo and his office of deputy premier. Agreement was reached between Gomulka, Ochab and Cyrankiewicz as to the composition of the new Politburo.

Three Critical Days.—On Oct. 19 when the party's central committee had assembled to elect a new Politburo, quite unexpectedly Khrushchev, V. M. Molotov, L. M. Kaganovich and A. I. Mikoyan arrived in Warsaw. At the same time Marshal Ivan S. Koniev, commander in chief of the unified armed forces of the Warsaw treaty powers, arrived in the capital, accompanied by other Soviet generals. It was learned that Soviet divisions stationed in southwestern Poland with headquarters at Legnica were moving toward Warsaw, while a Soviet naval squadron appeared before Danzig.

The meeting of the central committee, after co-opting Gomulka as its new member, decided that the old Politburo including Gomulka would discuss Polish-Soviet relations with the Soviet guests. This meeting, which took place in the Belweder palace, was stormy. The original intention of Khrushchev and his colleagues was to oppose the election of the proposed new Polish Politburo, agreeing only to the co-option of Gomulka and one or two of his supporters. Brave words were pronounced at this meeting by Ochab and Gomulka and, on the night of Oct. 19–20, the Polish leaders succeeded in explaining to the Soviet visitors that the Polish people's democracy must be an equal, independent and sovereign state bringing its own creative contribution to the development of the "camp of Socialism."

Meanwhile, Polish workers and university students, aroused by the Soviet intervention, demonstrated vociferously, through meetings and processions, their protest against foreign pressure and their support for Gomulka. Khrushchev and his colleagues understood that by supporting the Natolin group they were risking bloodshed. They accordingly retreated and on Oct. 20 returned to Moscow. When the Polish central committee reassembled angry questions were asked about the movements of Soviet troops in Poland. Marshal K. K. Rokossovsky, minister of national defense and commander in chief, explained that they were no more than "autumn manoeuvres."

Immediately after this declaration Gomulka presented his program and the next day his speech was broadcast to the nation. Without belittling the achievements of the six-year plan (1950–55), Gomulka criticized many of its results. He said that to represent the Poznan tragedy as the work of "imperialist agents" was politically naïve. Without the confidence of the working



POLISH SOLDIERS AND A TANK guarding bank at Poznan, Pol., during anti-communist riots in June 1956

class no government was possible. To produce more, cheaper and better goods it was imperative to tell the workers the whole truth about the country's difficult position and to ask them to be patient in their just demands. Structural changes in planning and in the management of industry were necessary; so was the development of handicrafts. Agricultural policy also called for serious correction. The basically sound co-operative farms should be assisted in the form of repayable credits and all state grants should be abolished; unsound co-operatives should be left free to dissolve themselves. Gomulka reiterated his belief that there were many roads to Socialism. The constant essential element in Socialism, he said, was the abolition of the exploitation of man by man. Polish-Soviet relations based on the principles of equality and independence would create among the people such a profound feeling of friendship for the Soviet Union that no attempt to sow distrust of the U.S.S.R. would find a response.

On Oct. 21 the plenary session elected the new nine-member Politburo. In a secret ballot, Gomulka obtained 74 votes, the maximum possible being 75, while Rokossovsky secured only 23 votes. No member of the Natolin group remained in the new key body of the party. On the evening of Oct. 22 Khrushchev informed Gomulka by telephone that, having read his speech, he agreed with it except for a few details. He also undertook that the Soviet military units would stop their "autumn manoeuvres" and would be ordered back to their regular bases.

In quick succession a series of army changes was announced. The most important was the replacement on Nov. 13 of Marshal Rokossovsky as minister of defense by Gen. Marian Spychalski, a friend of Gomulka. Rokossovsky returned to Moscow and on Nov. 15 was appointed deputy minister of defense of the U.S.S.R. During the first week of November, 32 Russian officers in the high command of the Polish armed forces were dismissed and replaced by Poles.

Return of Cardinal Wyszyński.—On Oct. 28 Stefan Cardinal Wyszyński, primate of Poland and archbishop of Warsaw and Gniezno, released from three years' internment, returned to Warsaw as head of the Polish hierarchy. Five other bishops and all imprisoned priests were released from confinement.

Gomulka's Visit to Moscow.—Between Nov. 15 and 18 Gomulka, Cyrankiewicz, Zawadzki and Stefan Jedrychowski discussed the future of Polish-Soviet relations with Khrushchev, K. E. Voroshilov, Bulganin, Mikoyan and M. Z. Saburov. Both

sides agreed that the Soviet-Polish alliance was a reliable guarantee of their mutual security and that the alliance was the cardinal factor in strengthening the independence of the Polish people's republic and "the inviolability of its frontier on the Oder and the Neisse." The temporary presence of Soviet army units on the territory of Poland was still "desirable" but they should in no way infringe the sovereignty of Poland or interfere in its domestic affairs. In pursuance of this statement, D. T. Shepilov and Marshal G. K. Zhukov, respectively the Soviet foreign and defense ministers, and Adam Rapacki and Gen. Spychalski, respectively the Polish foreign and defense ministers, signed a treaty on Dec. 17, in Warsaw, on legal status of Soviet troops stationed in Poland. The location, strength and movements of Soviet army units in Poland were to be determined by special agreements between the two governments. As certain financial problems between Poland and the U.S.S.R. had been unadjusted for years, the two parties agreed to consider as settled, as from Nov. 1, 1956, Poland's indebtedness for the credits granted to it by the Soviet Union between 1949 and 1956 and amounting to 2,300,000,000 roubles or \$575,000,000. Poland on the other hand had delivered to the Soviet Union during 1946-53 about 50,000,000 metric tons of coal at a nominal price of \$1.25 per ton. Assuming that the average world market price of coal during the 1946-56 period had been \$16 per ton, the loss to Poland's economy was about \$737,500,000. The Soviet government was ready to supply Poland, on a credit basis, with 1,400,000 tons of grain in 1957 and also agreed to grant Poland a long-term credit of 700,000,000 roubles. Finally the Soviet government agreed to facilitate the further repatriation of Poles still detained in Soviet forced labour camps. Their numbers were estimated in Poland at about 600,000, but it was not known how many of them were still alive. (See also COMMUNISM.)

(K. SM.)

Education.—Schools (1954-55): primary 23,103, pupils 3,202,700, teachers about 100,000; special 288, pupils 30,100; secondary 792, pupils 195,100, teachers about 5,000; vocational 2,236, pupils 455,000; teachers' training colleges 149, pupils 44,000; adult education courses 1,944, pupils 69,000; workers' high schools 150, pupils 41,900; institutions of higher education 84 (including 7 state universities and 1 Catholic university), students 143,300 (including 1,815 at the Catholic university). National minorities schools: primary 242, pupils 15,340; secondary 7, pupils 805.

Finance.—Monetary unit: zloty with official exchange rate, high and fictitious, of 4 zlotys to the U.S. \$1. Budget (1955 est.; 1956 est. in parentheses): revenue 122,000,000,000 (141,300,000,000) zlotys; expenditure 114,900,000,000 (137,700,000,000) zlotys, including 60,800,000,000 (73,400,000,000) zlotys invested in the national economy.

Foreign Trade.—(U.N. Economic Commission for Europe's estimates, in U.S. dollars, 1954.) Trade turnover with all countries \$1,770,000,000 including \$1,220,000,000 with the countries of the Communist group. Polish official figures (1954): imports 3,615,200,000 zlotys, exports 3,475,200,000 zlotys.

Transport and Communications.—Highways (1954): 264,525 km., including 97,886 km. hard surfaced. Licensed motor vehicles (1955 est.): cars 30,000, commercial 57,000. Railways (1954): 26,999 km., including 3,909 km. of narrow-gauge track; passenger traffic 39,491,100,000 passenger-km.; freight traffic 62,460,900,000 ton-km.; freight carried 296,215,000 metric tons. Shipping (1954, ships of 100 tons and over): vessels 142, total tonnage 291,000 gross tons. Freight traffic in Polish ports (external trade, 1954): loaded and unloaded 15,873,000 metric tons, including Szczecin 6,280,000 tons, Gdynia 4,798,000 tons and Gdansk (Danzig) 4,795,000 tons. Air transport (1954): passengers carried 136,700 (53,300,000 passenger-km.). Telephones (1954) 301,000. Radio licences (April 1954) about 1,500,000.

Agriculture.—Main crops (metric tons, 1934-38 average within post-1945 boundaries; 1954 in parentheses): wheat 1,965,000 (2,001,900); rye 6,854,000 (5,843,700); barley 1,632,000 (1,085,500); oats 2,833,000 (2,073,300); potatoes 38,014,000 (35,661,700); sugar beets 5,962,000 (6,950,000). Livestock (1938, prewar territory; 1954 in parentheses): cattle 10,554,000 (7,686,500); pigs 7,525,000 (9,788,200); sheep 3,411,000 (4,170,400); horses 3,916,000 (2,649,500).

Industry.—Employment outside agriculture (1938; 1955 in parentheses): 2,730,000 (5,860,000). Production (metric tons, 1938, prewar territory; 1955 in parentheses): coal 38,104,000 (94,476,000); lignite 10,000 (6,000,000); coke 2,328,000 (10,036,000); crude petroleum 507,000 (180,000); electricity 3,977,000,000 (17,751,000,000) kw.hr.; pig iron 880,000 (3,112,000); steel 1,441,000 (4,426,000); zinc, metal 108,000 (156,200); aluminum (1955) 20,400; cement 1,719,000 (3,813,000); sulphuric acid 181,000 (450,000); sugar 562,100 (980,500); cotton fabrics 51,500 (114,000); woollen fabrics 20,900 (51,400); leather shoes, excluding handmade shoes 2,800,000 (24,600,000) pairs; motor cars (1955), passenger 4,016, commercial 12,480; merchant vessels, launched (1955) 110,300 dead weight tons.

Pole Vaulting: see TRACK AND FIELD SPORTS.

Police. United States police administrators in 1956 made determined efforts to increase the efficiency and effectiveness of their operations in order to reverse the rising crime trend. The year 1955 was the first since 1947 to experience a decrease in major crime (Part I offenses), although the decrease was slight (0.2%) and was followed by an appreciable upsurge in crime during the first half of 1956.

The 1955 decrease in major crime was enjoyed by only one population group of cities—those having more than 250,000 inhabitants. The decrease for this group of cities was 4.3%. The increase for all other cities, as a group, amounted to 2.9%. The upsurge of crime during the first half of 1956 brought an increase in major criminal offenses of 18.6% over the comparable 1955 figures for communities with populations of less than 250,000 as a group, in contrast to an increase of only 11.1% for the group of cities in the more than 250,000 population category.

In order to appraise the preventive effect of police operations on these large cities, consideration was restricted to three categories of crimes that were more reliably reported and recorded than the other classes as a group, and that were also more susceptible to prevention by effective patrol. These categories were robbery, burglary and auto theft. The crime record of one community was not complete and this city of approximately 800,000 inhabitants was excluded from consideration.

Analysis revealed that not all of the remaining 40 cities in the large city population group reduced their crime frequency; in some crime increased substantially. A selected group of 14 of these large cities enjoyed decreases in these three classes of crimes in contrast to the substantial increases experienced by the remaining 26 cities as a group.

In 1955 the 14 cities reduced their 1954 over-all crime figures in robbery, burglary and auto theft by 12.7% while the remaining 26 cities experienced an over-all increase in these crimes of 6.1%. During the first six months of 1956, as compared with the same period in 1955, the 26 cities suffered an increase in the frequency of each of these three classes of crimes while the 14 cities enjoyed a decrease in the number of robberies and burglaries. While auto thefts, during this time, increased in the 14 cities by 17.3%, they increased 44.9% in the remaining 26 cities. A detailed comparison of increases and decreases in the frequency of these three classes of crimes on these two groups of cities is shown in the following tabulation.

Percentage Increase or Decrease
1954-1955

First six months
1955 vs. 1956

	Robbery	Burglary	Auto theft	Robbery	Burglary	Auto theft
14 cities*, population 23,053,000	-22.3	-14.4	-1.9	-5.7	-3.2	+17.3
26 cities†, population 11,266,000	-1.0	+3.2	+12.9	+13.5	+4.0	+44.9

*New York city, Chicago (Ill.), Los Angeles (Calif.), Philadelphia (Pa.), Detroit (Mich.), Cleveland (O.), St. Louis (Mo.), Washington (D.C.), Milwaukee (Wis.), Minneapolis (Minn.), Cincinnati (O.), Kansas City (Mo.), Dallas (Tex.), and Oakland (Calif.).
†All other cities having a greater population than 250,000 in 1950 except one of 800,000 population whose crime statistics were not complete.

The leadership of the 14 police departments, on the whole, was recognized as aggressive and superior. This did not mean that all 14 departments followed a uniform pattern in their organizations and operating procedures. The superiority was apparent from the experiments and other efforts made by these police leaders, as a group, to reduce their crime rates, in contrast to the apparent willingness of the remaining 26, on the whole, to continue operations as they had in the past, on the assumption that their procedures could not be improved.

Nearly all police departments in the cities of more than 250,000 population group that had created formal planning and research units, had instituted continuing programs of internal inspections and had undertaken to increase the preventive-effectiveness of their patrols were found among the superior 14. For example, 57.0% of the 14 used one-man patrol cars on each shift as compared with 23.1% of the remaining 26. On the other hand, 38.5% of the 26 used no one-man patrol cars at any time as compared with 28.6% of the 14.

The 63rd annual conference of the International Association of Chiefs of Police was held in Chicago, Ill., in Sept. 1956. Its international character was established by representatives from Brazil, Canada, Ceylon, Cuba, Indonesia, Iran, Japan, Laos, Nicaragua, Philippines, Republic of China and Thailand. The program gave more than usual attention to staff activities in police departments; one session was devoted exclusively to police administrative matters.

(See also CRIME; FEDERAL BUREAU OF INVESTIGATION; SECRET SERVICE, U.S.)
(O. W. W.)

Poliomyelitis. In 1956 the value of the Salk poliomyelitis vaccine for the prevention of paralytic poliomyelitis was clearly demonstrated throughout the world.

In the United States alone the incidence of paralytic polio was cut by one-half, the result of what was undoubtedly the largest voluntary immunization program on record. By the fall of 1955 about 7,000,000 U.S. school children had received one or more injections of Salk vaccine. Before the end of the polio season of 1956 more than 40,000,000 persons—mostly under 15 years of age but including a great number of pregnant women—had received one injection; 20,000,000, two injections; and 7,000,000, three injections.

Vaccination Progress in the U.S.—The most serious unanswered question about polio vaccination programs at the beginning of 1956 was whether the six U.S. manufacturers licensed to produce Salk poliomyelitis vaccine could produce it in large enough quantity fast enough to meet the demand and need for the product and thus assure the vaccination of a large proportion of susceptible children and young adults before the 1956 polio season.

Serious technical problems of manufacture were involved, plus the fact that the safety-testing program for the vaccine, established by the U.S. public health service in 1955, was probably the most rigid and time-consuming ever put into effect. The time required for manufacture and testing of each lot of polio vaccine is 120 days. The safety of the Salk polio vaccine was reconfirmed in 1956. After more than 50,000,000 injections had been given before the end of the polio season, there was not

a single case of polio that could be attributed to the use of the vaccine.

A poliomyelitis surveillance unit had been established in 1955 as part of the communicable disease control centre of the U.S. public health service especially to watch out for such a possibility. It found no cases of polio caused by vaccine. However, the surveillance unit helped uncover a considerable number of "poliolike" diseases, notably aseptic meningitis, that might formerly have been diagnosed as polio. The laboratory diagnosis of polio, from blood and faecal samples in tissue culture, greatly improved the positive diagnosis of polio when it actually occurred.

Between April 1955, when polio vaccine was first licensed, and Sept. 1956 the U.S. pharmaceutical industry produced and the U.S. public health service released 100,000,000 c.c. of polio vaccine. The vaccine supply became adequate in July 1956, and strictly enforced priorities on its use were soon lifted. Vaccine became available through normal drug distribution channels to anyone in the U.S. who wished to take it. It was recommended that this protection be given to everyone up to about age 40. While the incidence of paralytic polio in the higher age groups is comparatively low, the severity of the disease, should it strike, is often great and damaging.

Approximately 25% of cases of paralytic polio in the U.S. occur after age 20, but the number after age 40 is almost negligible.

Effectiveness of Polio Vaccine Program.—In Oct. 1956 the U.S. public health service reviewed polio season reports from 14 states where the disease was most prevalent in 1956. This review showed: (1) Among children who received one or more injections of Salk vaccine, only 1 in 12,500 contracted polio. The rate among the unvaccinated was five times as high. In other words, even one injection was 80% effective. (2) Among 1,500,000 children fully immunized against paralytic polio, with three injections properly spaced only seven cases of paralytic polio occurred. Their risk was therefore only one-fortieth that of the unvaccinated children. (3) In some states more than 90% of the cases of polio reported were among unvaccinated children.

The year 1956 was the lightest "polio year" experienced in the U.S. since 1947. Approximately half of all reported cases of polio are paralytic. Somewhat more than 15,000 cases of polio were reported in 1956.

In June the most serious outbreak of paralytic poliomyelitis of 1956 occurred in Chicago, centred largely in tenement sections. An emergency mass immunization program was promptly put into operation. Vaccine centres were set up in physicians' offices, in schools and even on street corners. By the first week in August the threatening epidemic was halted. Of slightly more than 1,000 cases occurring up to the end of September, not one case of paralytic polio was reported in a person who had received full immunization with vaccine.

The vaccine dosage schedule recommended (by Jonas Salk) and used in 1956 was two 1-c.c. injections, spaced two (preferably four) to six weeks apart, followed by a 1-c.c. booster injection at least seven months later.

Studies on the duration of immunity achieved by the vaccine continued in 1956. It became clear that immunity was reasonably long-lasting following full immunization and that annual booster shots are not needed.

Salk vaccine, with slight modifications of the U.S. and Canadian manufacturing formulas, was used throughout the world during 1956. Among the countries that actively developed vaccination programs were Denmark, Sweden, Norway, western Germany, England, Australia, the Union of South Africa, France, Argentina (which was struck by a serious polio epidemic in 1956)

and Brazil.

Virus Research.—Research on polio and other viruses was vigorously prosecuted in 1956, much of it under grants from the National Foundation for Infantile Paralysis. Attention was given to the possibility of finding or cultivating harmless, modified strains of polio virus, types 1, 2 and 3, so that a safe "live virus" vaccine might eventually be made. Considerable research proceeded in the attempt to find stable strains of normal cells on which virus could be made to grow under test-tube conditions (tissue culture).

The inner nature and spacing of the virus particle itself was more fully explored and its chemistry more completely worked out. The difficulty of such research is apparent when it is realized that these particles may be no more than a millionth of an inch in diameter.

Much research in 1956 focused on nucleic acid, which is at the heart of a virus and apparently has most to do with its ability to multiply and cause damage in the host cell. This research raised hopes of solving problems still posed by other major diseases, notably cancer, and of developing vaccines against other virus diseases, such as measles and infectious hepatitis.

(H. E. V. R.)

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Political Parties, U.S. During 1956, in an election in which ticket splitting seemed to be the rule, Republicans gained another four-year term in the White House and Democrats retained numerical control of both houses of congress. The country had grown accustomed in two previous years to divided party responsibility for government, but it was the first year since 1848 that a president had swept to election without carrying his party along to control at least one of the houses.

In his landslide victory over Democrat Adlai E. Stevenson, Pres. Dwight D. Eisenhower rolled up a record of about 35,500,000 votes, which was about 9,500,000 more than Stevenson's total. But these 35,500,000 votes reached far beyond the normal strength of the Republican party, as such. Stevenson's total failed to measure up to the strength of the Democratic party displayed in holding its 49-to-47 edge over the Republicans in the senate, increasing its margin to 234 to 201¹ Republicans in the house and gaining a net of two governorships.

On the basis of the November election returns, Republicans could claim that they had gained followers in the large industrial states of the east and midwest, where once the Democrats were strong. Those areas made a major contribution to Eisenhower's vote increase over 1952.

Democrats made most of their gains in congressional seats and governors' races in the farm areas west of the Mississippi and in the far west. Despite the fact that Eisenhower carried each of them, Arizona, Colorado, Oregon and Washington all elected Democratic governors and Democratic senators. The same thing happened in Florida, as Eisenhower made fresh inroads in the south beyond his 1952 victories in that area. Eisenhower took Kansas, Iowa, Minnesota and Michigan, but Democratic governors were elected in each of those states. In Kansas and Iowa the election of G.O.P. governors had been almost traditional.

In the farm states Eisenhower's margin over Stevenson was

¹One Republican seat from Maine contested.

less than that of 1952. In Iowa, for example, the president's share of the two-party vote dropped off 5% from 1952 to 1956. But he still got nearly 58% in 1956, which was accepted by politicians as indicating that while there might have been a farm revolt against his flexible price support policies, it was not sufficient to endanger his general popularity.

Farther west, the Republicans felt some increased opposition to the Eisenhower administration's "partnership" power policies and its handling of the nation's natural resources. Democrats evidently made some headway with their charges that the administration was engaged in a "give-away" of resources. Eisenhower's margin over Stevenson declined in the Pacific coast states, although the president still won them handily.

The presidential campaign tended to reveal the differences in philosophy between the two major parties. In a reversal of the 1952 campaign, the Democrats were on the offensive and the Republicans on the defensive. This led Stevenson into a series of attacks on the Eisenhower administration, Vice-Pres. Richard M. Nixon and, in the final phases of the electioneering, on the president himself. Stevenson began by saying that he would not make an issue of Eisenhower's health, despite the president's heart attack on Sept. 24, 1955, and his abdominal operation on June 9, 1956. Stevenson wound up by saying that in his opinion Eisenhower "never had the inclination and now lacks the energy for full-time work at the world's toughest job." In the same speech the Democratic candidate predicted that Nixon would be president before four years had elapsed.

The Democratic attack on Nixon seemed gauged to meet the possibility that the vice-president might succeed to the presidency and thus become the certain 1960 G.O.P. presidential nominee. Stevenson called Nixon a "man of many masks" who was "shifty" as well as "rash and inexperienced." Nixon's principal criticism of Stevenson was that all the Democratic nominee had offered to the people in the campaign was "an appallingly naïve suggestion for stopping our H-bomb tests when the Russians are stepping up theirs and what appears to be a politically inspired suggestion for ending the draft." Eisenhower said that there had been "many futile and foolish attempts to belittle the character" of Nixon, attempts which the president said ought to be squashed.

Eisenhower's defense of Nixon fitted in with the president's expressed determination to make over the Republican party into an organization that would be "modern" in its philosophy and appeal to the younger voters. The president said after the election that he would work incessantly and industriously to give his party such a modern look. What he had in mind, the president said, was "a type of political philosophy which recognizes clearly the responsibility of the federal government to take the lead in making certain that the productivity of our great economic machine is distributed so that no one will suffer disaster, privation, through no fault of his own."

With Stevenson a defeated candidate, none spoke up after the election to outline the future Democratic philosophy. But Sen. Estes Kefauver of Tennessee, the Democratic vice-presidential candidate, seemed to have put it most simply of all in the campaign cacophony. He said that the Democrats were more interested in individuals and their problems than the Republicans ever would be.

The election results indicated passage of the Democratic leadership to the congressional branch of the party. This meant that Sen. Lyndon B. Johnson of Texas, the senate Democratic leader, and Speaker of the House Sam Rayburn (also of Texas) would be in a commanding position to write the record on which party members would run in the 1958 midterm elections and to lay the groundwork for the Democratic campaign for the presidency in 1960. Johnson's explanation of the November results



"THE TERM IS 'UNINSTRUCTED,' DEAR! . . . Stop telling everyone that I'm going to the national convention as an 'uninformed' delegate! . . ." a cartoon of 1956 by Lichty of the Chicago Sun-Times Syndicate

was that the people had rallied around the president, in a time of crisis in the middle east, but had preferred a Democratic congress because of the record the party had made in the 84th, which it controlled.

Stevenson's struggle toward the presidential nomination was a rough one. Kefauver won the early primaries, and that brought on some tough exchanges between them before Stevenson defeated his rival in the Oregon, Florida and California primaries to get a firm hold on the nomination. At the party convention, former Pres. Harry S. Truman tried unsuccessfully to advance the candidacy of Gov. Averell Harriman of New York, but Stevenson won on the first ballot. In the "open convention" choice of a vice-presidential nominee, Sen. John F. Kennedy of Massachusetts came close to the nomination, but Kefauver finally won it.

Primarily, Stevenson's drive was aimed toward winning back Democrats who had voted for Eisenhower in 1952, an objective Democrats would seem likely to place first on their agenda for 1958 and 1960.

Stevenson bid for the farm vote, for the support of those who were social-security minded, for labour backing and for the votes of those who felt the Eisenhower administration was not keeping abreast of world developments. He spent a great deal of time talking about Eisenhower as a part-time president and implying that Nixon was in a position to take over domination of the Republican party.

On the Republican side, Eisenhower said he would not barnstorm or make whistle-stop speeches. Republican National Chairman Leonard W. Hall called on Nixon for the strongest efforts in the campaign, resigned to the idea that Eisenhower would make only a half-dozen appearances for nationally televised addresses.

Hall's slogan for the campaign, which was promptly adopted by Eisenhower and Nixon as well as most of the local G.O.P. candidates, was "peace, prosperity and progress." There were few to deny that prosperity marched on the Republican side,

despite some isolated areas of unemployment and some economic distress among the farmers and small businessmen. Until the last few days of the campaign, when Great Britain, France and Israel struck at Egypt, the Republican cry of "Everything's booming but the guns" had few challengers. When war broke out in the middle east, the voters rallied to Eisenhower rather than to Stevenson, who had been at pains to make a case that the Republicans had bungled their way into a situation that invited such a result.

In retrospect, the campaign for the Republican nomination consisted primarily of party members' interpretations of medical bulletins and Eisenhower's statements on the state of his health. There was never any doubt that if he himself chose to run, Eisenhower could have the nomination again. The indecision began in January when the president left some doubts at his first news conference in five months that he felt well enough to run again. Eisenhower's continued indecision in subsequent conferences convinced Sen. William Knowland of California, the senate Republican leader, that he ought to enter some primaries. Knowland did, but when the president let his name stay on the ballot, was said to be in good health by his doctors, and then announced on Feb. 29 that he was running again, the contest was all over.

From Jan. 25 until April 26 Eisenhower left open the question of his running mate. But after a conference on the latter day, Nixon came out of the White House to say he would be honoured to run with Eisenhower. The press secretary to the president, James C. Hagerty, said that Eisenhower was delighted with Nixon's decision.

This seemed to have settled matters until Harold E. Stassen, special assistant to the president, on July 23 started a campaign to replace Nixon with Gov. Christian Herter of Massachusetts. Hall and Sherman Adams, assistant to the president, then got Herter to agree to nominate Nixon for second place on the ticket at the G.O.P. convention in San Francisco. Stassen gave up his campaign only after he had conferred with Eisenhower at San Francisco and had finally become convinced that the president wanted Nixon. About the only result of Stassen's drive was the "Joe Smith" incident at the G.O.P. convention, where Terry Carpenter, a delegate from Nebraska, a former Democrat, tried to offer in nomination "Joe Smith," a nonexistent person, for vice-president as a gesture toward an open convention.

As the campaign got under way, Eisenhower's concern with success for other G.O.P. candidates led him to expand his speaking plans. Before he finished his campaign in Philadelphia a few days before the election, Eisenhower had travelled 13,614 mi., mostly by air, to visit 13 states. They were Pennsylvania, Iowa, Illinois, Ohio, Kentucky, Minnesota, Washington, Oregon, California, Colorado, New York, Florida and Virginia. He won all of them, along with 28 other states he did not visit, but he was not so successful in electing other Republicans.

Eisenhower carried the Republican banner farther into the south than he had in 1952. In addition to Texas, Florida, Tennessee and Virginia, which he had won four years previously, he won Louisiana. In the border states, he added Kentucky and West Virginia to his previous conquest of Oklahoma. But he suffered a reverse in Missouri, which Stevenson could not carry in 1952 but did in 1956.

Part of Eisenhower's new-found strength in the south was attributed to a movement of Negro voters toward the Republican party. Negro voters were credited with putting in Eisenhower's column Montgomery, Ala., where 10,000 persons turned out in February for a rally put on by the segregationist Citizens' council, opposing the supreme court's school desegregation ruling. Similarly, Negroes gave Eisenhower support a Republican candidate was unaccustomed to in New York city and in many

industrial big cities. Stevenson and Eisenhower took about the same position on the court's decision—that it was the law of the land and eventually would become reality. But a southern manifesto signed by 19 southern senators and more than 80 southern house members, plus the actions of southern Democratic-controlled state legislatures in moving to offset the court's opinion, seemed to have influenced Negro voters toward support of Eisenhower.

After the election the Democrats faced the necessity of raising about \$1,000,000 to meet their campaign deficit. The amount spent in the campaign by the major party organizations, subsidiary committees, individual candidates and citizens who contributed independently was a matter of conjecture. About the only solid figures were reported by the senate subcommittee on privileges and elections. This group said that between Sept. 1 and Oct. 21 Republicans got \$10,531,000 in campaign contributions, Democrats \$3,872,000, plus \$577,000 that went to organized labour groups. With expenditures of about \$2,000,000 on television for each party, Republicans were reported to have ended the campaign with money in the bank and Democrats with their \$1,000,000 deficit.

(See also ELECTIONS, U.S.; SOCIALISM; UNITED STATES.)

(J. L. BE.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*The Congress* (1954); *Political Parties* (1952); *Presidential Elections* (1952).

Political Science. During 1956 the main focus in the field of political science appeared to have been on methodology and theory, particularly in those nations where political science was newest and had advanced most rapidly since World War II. Great intellectual vigour had developed in some countries where a few years earlier political science was virtually unknown, and national differences with reference to assumptions, methods and emphases were being replaced by a subject with common classifications and methods. In India, for example, a new journal, the *Indian Journal of Political Science*, had been started and a large percentage of the articles dealt with scope and method. India, like many other countries, was taking the best from several scholarly traditions and combining them with its own. One author, writing on "Aristotle's Methodology of Political Science," observed, with obvious reference to certain tendencies in the west, that when "scientism," or scientific method, becomes equated with the desire to create a value-free social science, there is danger that political science will become a mere science of means and techniques for the preservation of power—a new Machiavellianism—whereas what is needed is a study of means for the realization of the good of all living things. Another Indian political scientist, on the other hand, writing in the same journal, concluded that a scientific methodology is possible, not because there are inherently unbiased ideas, theories and evaluation, but because these can be made bias-free through the purification of the scientist's subjectivism. Next to their preoccupation with methodology and theory, the main concentration of Indian political scientists during 1956 was on public administration, planning, intergovernmental relations and the relation between government and the economy. This generalization may be safely applied to most countries which are in the midst of a rapid economic development.

British political scientists had also started a professional journal after the conclusion of World War II, called *Political Studies*. An analysis of its content indicated that there was a tendency for political science in Britain and the United States to find a common ground. This was not true a few years earlier because the British approach was almost entirely historical, the American analytical. During 1956, however, British political scientists gave much attention to "behavioral" studies centring

around the political process; voting behaviour is one of these, public opinion polling another. Also, pushing the parallel further, British studies had begun to use psychology and quantitative methods associated with it, whereas a short time before there was almost none of this.

There were new stirrings in German political science, with the main concentration being on international relations and the internal problems of the German Federal Republic. This was significant because, for 75 years prior to the advent of Hitler, German political science had occupied a high reputation, and no country had devoted so much attention to systematic theory. It was still too early to predict what form the recrudescence would take; the indications were that less attention would be given to the abstract qualities of the state and relatively more to international relations, comparative government and public administration.

In the U.S.S.R. and its satellites, the main concentration seemed to have been on international law and relations, accompanied by certain practical problems that grew out of this complex, such as the treatment of minorities, the concept of sovereignty and comparative legal systems. Political scientists from these countries attended the Stockholm congress of the International Political Science association in the fall of 1955.

Political scientists in the United States continued to emphasize the "newer research technology," which is empirical, "realistic" and scientific in the sense of attempting to verify hypotheses and predict future behaviour. A characteristic of this approach was that it had been consciously nonlegal, non-historical and nonphilosophical, which was the direct opposite of traditional emphases in many other countries, and especially on the continent. Where U.S. political scientists had formerly turned their attention chiefly to the domestic scene to study purely American institutions and processes, by 1955 a main focus had shifted to the study of comparative governments, where the method had heretofore been purely descriptive. This represented

a significant development, not only for the United States but on a wider stage. At the same time, the field of international law and international relations showed signs of becoming the next major area where the newer research technologies were likely to be applied.

In short, to return to a world view, the year 1956 was characterized by a new vigour in new quarters, plus a tendency to find new and common grounds for professional advance.

(M. E. Dk.)

Polo. The Brandywine club of Kennett Square, Pa., carried off the national open title by defeating the Aurora quartet of Buffalo, N.Y., 11-10, in the final of the United States Polo association's 1956 tournament. Riding for the victors were R. Williams, R. Harrington, Jr., Clarence C. Combs and William A. Mayer. The Oak Brook Polo club at Hinsdale, Ill., played host to the open competitors and also was host for the national intercircuit, 12-goal and Butler handicap title events, giving the club a crowded calendar from Sept. 2 to Sept. 30. The Midland riders of Lamesa, Tex., Barry Beal, Carlton Beal, Gus White, Jr. and Carlton Beal, Jr., won the intercircuit prize by downing the Tulsa (Okla.) Polo and Hunt club, 9-8. The Oak Brook-Solo cup (Chicago, Ill.) quartet of Jack Murphy, Hugo Dalmar, Stanley Taylor and Leo J. Hulseman routed Healy Farms, 9-1, for national 12-goal honours. The Butler handicap competition was won by the Selma (Ala.) side of A. D. Beveridge, Robert Beveridge, George Oliver and Harold Barry when it halted the Circle F quartet of Dallas, Tex., 11-8. The United States 20-goal championship was played at the Milwaukee (Wis.) Polo club, Aug. 14-26, and honours went to Solo cup-Brandywine with a 12-8 victory over the Boca Raton four of Delray Beach, Fla. James Kraml, Jr., Harrington, Mayer and Taylor rode for the champions.

Squadron A armory in New York city was the scene of the major championship tourneys during the indoor season. The team of P. H. Brady, A. G. Pennell and Vincent Rizzo won senior honours by downing the New York Athletic club, 14-13. A penalty shot by Pennell after 10 seconds of sudden-death overtime play decided the contest. The Huntington (L.I.) club representatives H. F. Rice, Jr., Vincent Rizzo and Zenas C. Colt, topped Joy Farms of Milwaukee, 9-8, for the 12-goal crown. Another Huntington trio of Abe Wagner, Raymond Koch and Rizzo won the Sherman memorial prize by routing the Long Island Hurricanes, 16-6, in the ultimate round. Cornell turned back Yale, 20-6, in the last-round battle for the national collegiate championship.

Camilo Saenz, H. F. Rice, Jr., and Alberto Santa Maria comprised the winning team.

(T. V. H.)

Popular Music: see MUSIC.

Population, Movements of: see REFUGEES.

Populations of the Countries of the World: see AREAS AND POPULATIONS OF THE COUNTRIES OF THE WORLD.

Population Statistics: see CENSUS DATA, U.S.

Pork: see MEAT.

Porto Rico: see PUERTO RICO.

Portugal. A republic of southeastern Europe, forming part of the Iberian peninsula. Portugal is bounded east and north by Spain. Area: 35,529 sq.mi., including Azores (890 sq.mi.) and Madeira (308 sq.mi.). Pop.: (1950 census) 8,510,240, including Azores (318,558) and Madeira (269,769); (1956 est.) 8,843,000. Language: Portuguese. Religion: Roman Catholic. Chief towns (pop., 1950 census): Lisbon (cap.) 783,226; Oporto 281,406; Setubal 44,235; Coimbra 41,977; Funchal (Madeira) 37,035. President of the republic in 1956, Gen. Fran-



"DON'T LAUGH, I'M SERIOUS!" a 1956 cartoon by Dobbins of the Boston Post (Mass.)

cisco Higino Craveiro Lopes; prime minister, Antonio de Oliveira Salazar.

History.—The precision of the country's budgetary system was illustrated by the accounts for the financial year 1955 (in escudos): revenue 7,334,500,000; expenditure 7,303,700,000; surplus 30,800,000. Presenting the accounts in June 1956, the finance minister, Pinto Barbosa, said that the expansionist tendency of the national economy had persisted throughout the year despite a decline in prices for both home agricultural production and the raw materials of the overseas territories. In certain cases, insufficiencies of raw materials threatened the rhythm of the country's economic activities. The financial steps taken by the government to avert this resulted in some reduction in the favourable balance of payments and an increase in the volume of credit. Investments in 1955 under the first six-year development plan (1953–58), which totalled 1,086,000,000 escudos, included 537,000,000 escudos for hydroelectric undertakings, 205,000,000 escudos for port facilities and 175,000,000 escudos for railways.

The second six-year plan (1959–64), according to Marcelo Caetano, minister of the presidency, visualized the establishment of a national development bank which it was considered would be of great assistance in the financing of industrial schemes at home and in the overseas territories. Development of nuclear energy, it was stated, would become a factor of great importance in the future of the economy. In October in New York, Portugal was one of the signatories of the statute of the International Atomic Energy agency. The Portuguese representative, Vasco Vieira Garin, declared that under the terms of a bilateral agreement with the United States the first nuclear reactor would shortly be installed in Lisbon, where the building of an appropriate laboratory was about to begin.

A law for the general organization of the nation in time of war was approved by the national assembly in June. Gen. Julio Carlos Botelho Moniz, the chief of staff of the armed forces, on a visit to Washington, D.C., declared that Portugal could be counted upon with complete confidence to meet its obligations as a member of NATO (North Atlantic Treaty organization). In a reference to Spain's defensive agreements with the United States and Portugal, which, he declared, assured Spain's inclusion in the western system of defense, he characterized as "nonsense" that country's absence from NATO. A military mission visited Madrid in July for conversations with similar missions representing Spain and the United States, and there were reciprocal meetings in Lisbon later in the year "for the study of high problems of defense of the Iberian peninsula." Also in July it was announced by the minister of national defense, Fernando Costa, that the Portuguese airfields at Espinho and Montijo were to be rapidly expanded and placed at the disposal of the United States and other members of NATO.

In August Portugal, represented by Paulo Cunha, the foreign minister, took part in the Suez canal conference in London and subsequently joined the resulting Suez Canal Users' association. In November it was among the countries that abstained from voting in the UN general assembly on the U.S. motion calling for the withdrawal of Anglo-French forces engaged against Egypt in the Suez canal zone. (F. B. H.)

Education.—Schools (1953–54): primary 14,943, pupils 1,075,707, teachers (state only) 19,032; secondary 354, pupils 58,721, teachers (state only) 1,293; vocational 196, pupils 42,216, teachers (state only) 2,247; teacher training 15, students 2,462. Universities 3, students 14,563, teaching staff 777.

Finance and Banking.—Monetary unit: escudo, with an official selling rate of 28.75 escudos to the U.S. dollar. Budget: (1955 actual) revenue 7,361,000,000 escudos, expenditure 7,330,000,000 escudos; (1956 est.) revenue 7,679,500,000 escudos, expenditure 7,671,000,000 escudos. Internal debt (Dec. 1954) 10,958,700,000 escudos; external debt 692,800,000 escudos. Currency circulation: (Dec. 1954) 9,870,000,000 escudos, (Dec. 1955) 10,400,000,000 escudos. Deposit money: (Dec. 1954) 11,330,000,000 escudos, (Dec. 1955) 12,020,000,000 escudos. Gold and foreign ex-

change, central bank: (Dec. 1954) U.S.\$656,000,000, (Dec. 1955) U.S.\$672,000,000.

Foreign Trade.—(1955) Imports 11,445,000,000 escudos; exports 8,144,000,000 escudos. Main sources of imports: dependencies 16%; continental E.P.U. (European Payments Union) countries 43%; U.K. 14%; U.S. and Canada 10%. Main destinations of exports: continental E.P.U. dependencies 25%; continental E.P.U. 29%; U.K. 16%; U.S. and Canada 11%. Main exports: cork 21%; fish 11%; wine 8%.

Transport and Communications.—Roads (1954): continent 29,440 km.; islands 1,709 km. Motor vehicles in use (1954): passenger 89,766, commercial (incl. buses) 37,792. Railways (1954): 3,614 km.; 1,628,000,000 passenger-km.; freight (1955) 723,600,000 ton-km. Shipping: merchant vessels of 100 gross tons and over (July 1955) 323; total tonnage 563,417. Telephones (Jan. 1955) 231,373. Radio receiving sets (1954) 443,000.

Agriculture.—Production (metric tons, 1955; 1954 in parentheses): wheat 394,000 (748,000); barley 69,000 (104,000); oats 71,000 (126,000); maize 342,000 (386,000); rye 131,000 (190,000); rice 180,000 (154,000); potatoes 1,034,000 (1,073,000); broad beans 43,000 (49,000); meat 84,000 (90,000); wine 9,820,000 hectolitres. Livestock (Dec. 1952): cattle 973,000; sheep 3,948,000; pigs 1,253,000; horses 85,000; mules 123,000; asses 245,000; goats 1,244,000. Timber production (1954, metric tons) 4,922; raw cork (1952) 150,000. Fish landed (including Azores and Madeira, 1954) 307,300 metric tons.

Industry.—Fuel and power (1955): coal 412,800 metric tons; lignite 89,160 metric tons; electricity 1,884,000,000 kw.hr.; manufactured gas 57,600,000 cu.m. Production (metric tons, 1955): tin concentrates (metal content) 1,400; cement 781,200; cotton yarn 41,160; woven cotton fabrics 31,440; superphosphates (1954) 387,000. Ore production (metric tons, metal content, 1954): tungsten 2,508; manganese 4,000; pyrites 583,000; gold (1953) 462 kg.

ENCYCLOPÆDIA BRITANNICA FILMS.—*Iberian Peninsula* (1948); *Portugal* (1955).

Portuguese Overseas Territories. Under this heading are grouped the Portuguese possessions in Africa and Asia. Their total area is approximately 803,835 sq.mi. and the total population (1950 census) 11,863,548; (1955 est.) 12,446,000. Areas, populations, capital towns and governors of the territories are given in the table.

History.—Gen. Francisco Higino Craveiro Lopes, the president of the republic, paid an extended visit to the province of Mozambique between Aug. 2 and Sept. 9, 1956, spending a short time, on the return journey, in Angola and São Tomé. Later, he extended his tour to pay official visits to Salisbury, capital of the Federation of Rhodesia and Nyasaland, and to Johannesburg and Pretoria in the Union of South Africa.

Nothing more was heard of Communist China's ominous claim to Macao in Oct. 1955. In the Indian enclaves, too, there was relative calm. Aug. 15, Indian independence day, passed without repetition of the so-called "peaceful demonstrations" on the borders of Gôa and the other territories. Following the bloodshed of Aug. 1955, the Indian government had announced that Satyagraha (passive resistance) was no longer desirable as a means of "liberating" Gôa. That declaration might have influenced the situation. Another factor, however, was probably Portugal's recourse, in Feb. 1956, to the International Court of Justice. An action was filed in that court by the Portuguese government alleging India's refusal to allow right of passage through Indian territory to the two small enclaves of Dadrá and Nagar Aveli which had been isolated from Portuguese Damão and occupied since July 1954 by what was described as "armed and irresponsible bands." It was further alleged that while India had never invoked, and was in no way entitled to invoke, any rights of sovereignty over the enclaves concerned, it had nevertheless repeatedly and emphatically asserted its firm purpose not to allow the passage of officials and private citizens of Portugal to those territories. (See also INDIA.)

In response to a United Nations inquiry, a memorandum was sent to the secretary-general on the subject of labour conditions in the overseas territories. The document declared that the Portuguese penal code, in force in all territories and embracing all peoples under Portuguese sovereignty, did not impose forced labour as a penalty, not even in the form of re-educational or corrective measures. It further stated that all penalties imposed by Portuguese tribunals were in harmony with the law, that every person accused of crime had the right to defense

Portuguese Overseas Territories

Country	Area (sq.mi.)	Population (1955 est.)	Capital (pop., 1950 census)	Governor
AFRICA				
Angola	481,351	4,313,000	Luanda 141,647	*Capt. José Agapito da Silva Carvalho
Cape Verde Is.	1,557	172,000	Praia 9,980	Manuel Marques Abrantes Amaral
Guinea	13,948	541,000	Bissau 18,309	Silva Tavares
São Tomé and Príncipe Is.	372	58,000	São Tomé 7,817	Lieut. Col. António Pires Barata
Mozambique	297,731	6,040,000	Lourenço Marques 93,303	*Comdr. Gabriel Mauricio Teixeira
ASIA				
India†	1,538	644,000	Nova Gôa (Pangim) 31,950	*Brig. Gen. Paulo Bénard Guedes
Macao	6	200,000	Macao 166,544	Adm. Joaquim Marques Esparteiro
Timor	7,332	478,000	Dili 43,589	Capt. Cesar Maria de Serpa Rosa

*Governor general. †Comprises Gôa (1,390 sq.mi.); Damão (134 sq.mi.); and Diu (14 sq.mi.).

counsel and that all trials were absolutely public. It added that in the overseas provinces the system of legal processes was simpler than that normally adopted for the trial of Europeans, that justice must be subordinated to the mentality and the social state of the native and that it must be recognized that the judge had authority to require that an accused should speak only the truth.

On Sept. 7, in the presence of the president of the republic, the first consignment of Angolan oil (4,300 tons) was shipped from Luanda for the Lisbon refinery. Developments in the Angolan oil industry included the initiation of construction work on two storage tanks in Luanda, each of 15,000 cu.m. capacity, and the placing of a contract for a 12-in. pipeline from the Benfica storage depot to the quayside. (F. B. H.)

Angola.—Schools (1954): primary (including rudimentary) 1,165, pupils 50,320, teachers (1953) 1,598; secondary 22, pupils 2,830, teachers (1953) 189; vocational 144, pupils 5,115, teachers (1953) 1,185; teacher training 2, students 166. Principal products (metric tons, 1954): sugar (tel quel) 52,000; coffee 60,000; broad beans (exports, 1953) 20,159; sisal (exports, 1953) 30,579; palm kernels (exports) 9,200; cottonseed (1955) 13,000; cotton lint (1955) 6,000; palm oil (1955) 30,000; diamonds (1954) 721,600 metric carats; maize (1951) 135,000 metric tons. Foreign trade (1955): imports 2,687,000,000 escudos; exports 2,805,000,000 escudos. Roads (1954): 35,489 km.; motor vehicles in use 23,802. Railways (1954): 2,470 km. Shipping (metric tons, 1954): cargo loaded 113,465, unloaded 836,263. Budget (1955 est.): ordinary revenue 1,324,530,626 escudos, extraordinary revenue, 397,500 escudos; ordinary expenditure 1,125,750,626 escudos, extraordinary expenditure 596,380,000 escudos. Monetary unit: angolar, at par with the escudo. (Escudo valued at 3.5 cents U.S.)

Cape Verde Islands.—Schools (1954): primary 157, pupils 7,535, teachers (1953) 149; secondary 1, pupils 629, teachers (1953) 20; vocational 27, pupils 493. Principal products: castor oil, coffee, mustard, brandy, oranges and hides. Foreign trade (1954): imports 427,550,000 escudos, exports 426,486,000 escudos. Shipping (metric tons, 1954): cargo loaded 95,088, unloaded 718,330. Roads (1954) 545 km. Budget (1955 est.): balanced at 40,692,290 escudos (ordinary), and 21,600,000 escudos (extraordinary).

Guinea.—Schools (1954): primary including rural 122, pupils 6,811; secondary 1, pupils 148; vocational 4, pupils 118. Principal products (metric tons, 1953): palm kernels 13,000; peanuts (exports) 2,600. Foreign trade (1952): imports 217,295,000 escudos, exports 188,122,000 escudos. Shipping (1953): vessels entered 83; gross tonnage 186,483. Budget (1955 est.): balanced at 97,004,310 escudos (ordinary) and 7,350,000 escudos (extraordinary).

São Tomé and Príncipe Islands.—Schools (1954): primary 18, pupils 171; secondary 1, pupils 46; vocational 1, pupils 93. Principal products (exports, metric tons, 1954): palm kernels 4,200; cocoa beans 7,700; copra 4,932. Foreign trade (1954): imports 125,255,000 escudos, exports 48,291,000 escudos. Shipping (1952): vessels entered 2,098; net tonnage 8,734. Budget (1955 est.): balanced at 50,308,671 escudos (ordinary) and 35,500,000 escudos (extraordinary).

Mozambique.—Schools (1954): primary (including rudimentary) 1,782, pupils 231,998, teachers (1953) 2,008; secondary 14, pupils 2,096, teachers (1953) 100; vocational 63, pupils 5,179, teachers (1952) 185; teachers' training colleges 4, students 398. Principal products (metric tons, 1954): copra and coconut oil equivalent (exports) 43,100; sugar (tel quel) 113,000; cotton, lint (1955) 30,000; cottonseed (1955) 60,000; bananas (1954) 19,000. Budget (1954): revenue 2,449,844,000 escudos; expenditure 2,227,280,000 escudos. Foreign trade (1955): imports 2,623,449,000 escudos, exports 1,527,952,000 escudos. Shipping (metric tons, 1954): cargo loaded 3,057,186, unloaded 2,429,664. Roads (1954) 37,168 km. Motor vehicles in use (1954) 22,229. Railways (1954) 2,210 km.

India.—Schools (1954): primary 446, pupils 33,333, teachers (in the 46 state schools) 264; secondary 69, pupils 13,296; vocational 14, pupils 23; teachers' training college 1, students 36. University college (1954) students 157. Copra production (1953) 2,000 metric tons. Foreign trade (1952): imports 545,188,000 escudos, exports 241,471,000 escudos. Shipping (metric tons, 1954): cargo loaded 1,435,597, unloaded 204,961.

Roads (1954) 728 km. Motor vehicles in use (1954) 4,133. Budget (1955 est.): ordinary revenue 149,075,222 escudos, extraordinary revenue 76,345,250 escudos; extraordinary expenditure 76,345,250 escudos. Monetary unit: rupee=5.97 escudos.

Macao.—Schools (1954): rudimentary 96, pupils 20,553; primary 11, pupils 2,469; secondary 5, pupils 499; vocational 2, pupils 248. Foreign trade (1950): imports 171,900,000 patacas, exports 13,100,000 patacas; imports (1951) 344,300,000 patacas. Roads (1954) 26,268 km. Shipping (1950): vessels entered 13,679; net tonnage 4,922,437. Budget (1955 est.): balanced at 93,191,354 escudos (ordinary) and 22,000,000 escudos (extraordinary). Monetary unit: pataca=5.70 escudos.

Timor.—Schools (1954): primary 75, pupils 6,441, teachers (1953) 208; secondary 3, pupils 180, teachers (1953) 10. Foreign trade (1954): imports 63,187,000 escudos; exports 39,008,000 escudos. Budget (1952) revenue 7,813,000 patacas, expenditure 9,871,400 patacas. Roads (1954) 2,134 km. Shipping (metric tons, 1954): cargo loaded 9,358; unloaded 4,779. Principal products (exports, metric tons, 1953): copra 1,191; coffee 1,381.

Post Office. **United States.**—Revenues of the post office department for the fiscal year ended June 30, 1956, amounted to \$2,419,354,000 and expenditures to \$2,883,305,000, resulting in a gross operating deficit of \$463,951,000. Efforts of the postmaster general to obtain from congress postal rate increases on first-, second- and third-class mail died in the senate committee when the 84th congress adjourned. In asking for these increases Pres. Dwight D. Eisenhower pointed out that he had signed into law the postal field service, which represented the greatest forward step for the country's postal employees in more than a century. This act raised by an average of 8.1% the salaries of the 500,000 postal employees, including 15,000 in the Washington area. The annual increases provided in the law averaged about \$320.

On June 30, 1956, U.S. Treasury savings stamps were on sale at approximately 17,000 post offices. Sales from July 1, 1955, to June 30, 1956, amounted to \$19,179,914. During the year U.S. savings bonds with an estimated sale value of \$47,818,400 were sold in behalf of the treasury department. At the close of the fiscal year 1956, bonds were on sale at 2,914 post offices.

Through the 37,515 post offices, the 4,439 postal stations conducted under contract agreement and the 2,652 classified stations and branches, 56,441,200,000 pieces of mail matter were received for domestic mails and foreign destinations, transported and delivered during the fiscal year ended June 30, 1956. This mail had a total weight of 10,928,900,000 lb., representing an increase of 1,207,600,000 pieces and 84,500,000 lb. from the preceding year.

On June 30, 1956, there were 236,560 mi. of domestic air-mail routes in the United States. Following intensive traffic and cost studies, the post office department initiated in 1953 air service on a space available basis for three-cent first-class mail between New York, Washington and Chicago. This proved so successful that the experimental program by 1956 provided direct service through 24 major and local service air lines to about 205 U.S. cities in 31 states.

During the 1956 fiscal year rural route service was available to more patrons than ever before. Approximately 34,900,000 persons were served each weekday by 31,888 rural free delivery routes covering approximately 1,582,000 mi. These figures represented a reduction of 188 in the number of rural routes from the preceding year but an increase of about 38,000 in route mileage.

At the close of the fiscal year ended June 30, 1956, there were 2,482,426 depositors in the postal savings system, as compared with 2,711,110 on June 30, 1955, a decrease of 228,684

or 8.4%. The outstanding principal to the credit of depositors at the close of the year was \$1,765,469.846, a decrease of \$242,546.612 or 12.1%. In addition there were accrued interest obligations amounting to \$92,837,509.99, making a total liability to depositors of \$1,858,307.355.99.

On June 30, 1956, 15 regional headquarters offices had been established at Cincinnati, O.; Chicago, Ill.; Dallas, Tex.; Portland, Ore.; Minneapolis, Minn.; St. Louis, Mo.; Washington, D.C.; Philadelphia, Pa.; San Francisco, Calif.; Boston, Mass.; New York, N.Y.; Atlanta, Ga.; Denver, Colo.; Memphis, Tenn.; and Wichita, Kan.

The post office department transported 1,173,249,000 lb. of parcel post packages during the fiscal year 1956, with postal revenues amounting to \$589,921,000. For the previous fiscal year there were 1,135,550,000 lb. of parcel post carried with revenues of \$586,248,000. Only zone rate parcels were embraced in these figures. They do not include books, catalogues, etc.

The post office department operated 3,175 buildings during the 1956 fiscal year. (I. Gc.)

Canada.—The gross postal revenue from 11,996 post offices reached an all-time high of \$158,286,321 for the fiscal year ending March 31, 1956, an increase of \$6,603,900 over the previous fiscal year. Total expenditures were \$148,293,474.12, an increase of \$4,280,195.07 for the period.

The number of post office money orders sold reached a total of 49,081,082 for a value of \$725,930,732. This represented a 4.6% gain in the number of money orders and a 5.1% increase in their monetary value. The post office savings bank handled 296,424 accounts and had deposits for a total of \$36,164,460.

Air service for parcel post and articles other than letters and post cards was extended to 19 additional countries of the western hemisphere and to six additional countries in Europe. Parcel post

agreements were signed with Japan and Switzerland.

The expenditure for mail transportation was as follows: air mail service \$11,052,000, land mail service \$11,219,545, railway mail service \$14,255,304, for a total of \$36,526,849.

Letter carrier service was inaugurated at four additional centres during the year and 184 new letter carrier walks were established serving 112,239 families. At the end of the fiscal year 2,349,975 homes and business places were receiving letter carrier delivery service.

During the year 25 new postal buildings were completed, 53 were under construction and more than 300 were in the planning stage. (See also PHILATELY.) (W. TL.)

Potash: see MINERAL AND METAL PRODUCTION AND PRICES.

Potatoes. Total U.S. 1956 production was 244,150,000 cwt., 11% more than the 227,046,000 cwt. of 1955 or the average for 1949-54. The crop for the earlier part of the season was not only smaller than that of 1955 but also delayed in coming to market. Total acreage for harvest was 1,401,500 ac., less than 1% below 1955 but moderately below the 1949-54 average of 1,525,000 ac. A wet, late spring delayed planting and growth, but abundant precipitation in most important late producing areas resulted in an average yield for the late crop of 189.8 cwt. per acre, as compared with 168.8 cwt. in 1955 and an average for 1949-54 of 162.6 cwt.

U.S. Potato Production by Leading States
(In thousand hundredweight)

State	Indicated 1956	1955	Average, 1949-54
Fall crop			
Maine	40,600	35,814	33,856
Idaho	33,115	33,043	26,598
New York	14,420	14,675	14,113
North Dakota	12,150	7,830	10,284
Minnesota	10,400	7,600	8,219
Colorado	7,438	7,095	8,334
Pennsylvania	7,425	7,569	9,051
Michigan	7,200	4,896	7,066
Oregon	6,240	5,500	5,562
Wisconsin	4,960	4,297	5,043
Washington	4,131	4,845	2,804
Summer Crop:			
Washington	6,125	4,788	3,984
New York (L.I.)	4,100	3,780	4,649
Virginia	3,724	4,048	3,958
New Jersey	3,528	3,718	4,481
California	3,300	3,575	3,428
Wisconsin	2,465	2,255	2,514
Colorado	2,415	2,025	2,218
Oregon	2,220	2,145	1,895
Idaho	1,890	1,843	1,914
Spring crop			
California	22,762	22,536	18,238
Florida	5,539	6,080	4,483
Alabama	2,095	891	2,598
North Carolina	1,845	2,194	2,828
Arizona	1,032	1,352	994
South Carolina	605	585	978
Arkansas	576	660	788

Early season prices were favourable to producers, reaching \$5.19 per hundredweight in July and more than ten cents per pound at retail, a record high level. By October prices to producers had declined to \$1.34 per hundredweight as compared with a distress level of \$1.10 per hundredweight a year earlier. Distress calls were again in evidence, and wives of potato producers from the Long Island area picketed the White House in September.

As with the 1955 crop, of which about 12,000,000 bu. of low-grade potatoes and nearly 7,000,000 bu. of culls were diverted, the U.S. department of agriculture activated a diversion program for the 1956 crop, under which growers in areas with marketing plans might receive supplementary payments for potatoes diverted to starch, flour or feed, the payment declining from 50 cents per hundredweight through December to 30 cents after March.

About 1,000 tons of California potatoes exported under re-



THE "STAMPMASTER," an automatic stamp dispenser introduced by the U.S. post office in 1956 which, in addition to making change and delivering stamps, was equipped with a speaker to thank the purchaser. Two of the six replies made by the machine were: "Thank you. Thank the purchaser"; "Thank you. Now buy some more and save a trip"



FARMERS' WIVES picketing outside of the U.S. department of agriculture, Washington, D.C., in Sept. 1956. They were seeking higher support for potato prices.

irrigation to New Zealand in July were reported as arriving in good condition and well received by consumers. Exports of 50,610,000 lb. to Spain under public law 480 retailed at 2.9 to 3.5 cents per pound and were well received. Curbs on imports from Canada were reimposed in October on nonseed stock.

Trading in potato futures reached an all time high in 1956; new limits were set on maximum individual holdings and some demand was heard for a ban on trading unless practices were reorganized to better serve growers and dealers. A bladeless, rotating-rod potato digging machine was reported as demonstrating superior efficiency.

Europe experienced a potato shortage in the spring of 1956 as old supplies were reduced and new crop potatoes were delayed by the late winter freeze in the Mediterranean area. The important European potato crop for 1956 was indicated as a bumper one, as much as one-fifth larger than that of 1955 and above average. Higher yields on approximately the same planted acreage in 1955 accounted for most of the increase. Quality was reduced in some areas by the uncommonly cool, damp summer with associated blight damage, water logged soils, etc.

Sweet Potatoes.—The 1956 crop of 16,634,000 cwt. was 22% less than the 20,946,000 cwt. of 1955 and 19% below the 1949–54 average. About two-thirds of the decrease was accounted for by a cut in 1956 acreage, a result of low prices received for the 1955 crop. The 287,000 ac. for harvest was only 84% of the 1955 acreage and far below the 1949–54 average of 378,000 ac. Yields of 58.0 cwt. per acre were down from 61.4 cwt. in 1955 but above the 1949–54 average of 52.8 cwt. Louisiana with 4,350,000 cwt., was the leading producer, followed by North Carolina (2,640,000 cwt.), Virginia (1,384,000 cwt.) and New Jersey (1,350,000 cwt.). Average price to producers in October was \$3.52 per hundredweight against \$2.74 a year earlier. Some increase in plantings was anticipated for 1957. (J. K. R.)

ENCYCLOPEDIA BRITANNICA FILMS.—*Story of Potatoes* (1952).

Poultry: see EGGS; LIVESTOCK; MEAT.

Precious Stones: see GEM STONES.

Presbyterian Church. The year 1956 marked the 250th anniversary of the organization of American Presbyterianism on the North American continent.

The general assembly of the Presbyterian Church in the United States of America, meeting in May 1956 in Philadelphia, Pa., represented 256 presbyteries (the organizational unit above the congregation) with 8,603 churches, 10,131 ministers and 2,736,241 communicant members, contributing \$180,802,586 to the work of the Presbyterian Church in the U.S.A.

Of other branches of the Presbyterian Church, the largest is the United Presbyterian Church of North America. Division brought into being another contemporary branch in the Presbyterian Church in the United States (the southern branch of the Civil War period). A threefold union movement of these branches was defeated in 1954–55 by the vote of the presbyteries of the Presbyterian Church, U.S. A twofold union movement between the United Presbyterian Church of North America and the Presbyterian Church, U.S.A., was approved by the assemblies of these churches in 1956. The culmination of this union awaited the vote of the presbyteries of each group.

A larger federated union had developed in the World Presbyterian alliance of which there is a North American area consisting of the Associate Reformed Presbyterian Church, the Evangelical and Reformed Church, Free Magyar Reformed Church, Presbyterian Church in Canada, Presbyterian Church in the United States, Presbyterian Church in the United States of America, Presbyterian Church of Jamaica, Reformed (Dutch) Church in America, United Church of Canada and the United Presbyterian Church. Their combined communicant membership was approximately 6,000,000. Seven other Presbyterian bodies that had not joined the alliance were: Associate Presbyterian Church of North America, Bible Presbyterian Church, Colored Cumberland Presbyterian Church, Cumberland Presbyterian Church, Orthodox Presbyterian Church, Reformed Presbyterian Church in North America (General Synod) and Reformed Presbyterian Church of North America (Old School).

The decision of the U.S. supreme court on Negro segregation brought the problem into the area of the Presbyterian Church's responsibility. Although names of Negroes had appeared on the membership rolls of white congregations, no uniformity of practice existed. The ruling particularly affected the Presbyterian Church, U.S., located in the heart of the area involved. The general assembly of that church affirmed "that enforced segregation of the races is discrimination which is out of harmony with Christian theology" and urged that in higher education the doors be opened to all races and that sessions of local churches admit persons "on the Scriptural basis of faith in the Lord Jesus Christ without reference to race." Other branches of the Presbyterian Church recommended to their congregations and members to work for desegregation in all walks of life.

(See also CHRISTIAN UNITY; CHURCH MEMBERSHIP.)

(G. S. K.)

Presidents, Sovereigns and Rulers. The following is a list of the names of those holding chief positions in their countries as of Dec. 31, 1956:

Country	Name and Office	Accession
Afghanistan . . .	Mohammed Zahir Shah, King	1933
	Mohammed Daud Khan, Prime Minister	1953
Albania	Haxhi Leshi, Chairman of the Presidium of the People's Assembly	1953
	Col.-Gen. Mehmet Shehu, Chairman of the Council of Ministers	1954
Argentina	Gen. Pedro Eugenio Aramburu, President	1955
Australia	Field Marshal Sir William Slim, Governor General	1953
	Robert Gordon Menzies, Prime Minister	1949
Austria	Theodor Körner, President	1951
	Julius Raab, Chancellor	1953
Belgium	Baudouin I, King	1951
	Achille van Acker, Prime Minister	1954
Bolivia	Hernán Siles Zuazo, President	1956
Brazil	Juscelino Kubitschek, President	1956
Bulgaria	Georgi Damjanov, Chairman of the Presidium	1950
	Anton Yugov, Chairman of the Council of Ministers	1956
Burma	Ba U, President	1952
	Ba Swe, Prime Minister	1956

Country	Name and Office	Accession	Country	Name and Office	Accession	
Cambodia	Norodom Suramarit, King	1955	Rhodesia and Nyasaland, Federation of	Lord Llewellyn, Governor General	1953	
Canada	Vincent Massey, Governor General	1952		Sir Roy Welensky, Prime Minister	1956	
	Louis Stephen St. Laurent, Prime Minister	1948	Rumania	Petru Groza, Chairman of the Presidium of the Grand National Assembly	1952	
Ceylon	Sir Oliver Goonetilleke, Governor General	1954		Chivu Stoica, Chairman of the Council of Ministers	1955	
	S. W. R. D. Bandaranaike, Prime Minister	1956	Salvador, El	Lieut. Col. José María Lemus, President	1956	
Chile	Carlos Ibáñez del Campo, President	1952	Saudi Arabia	Saud ibn Abdul Aziz al Saud, King	1953	
China	Chiang Kai-shek, President of the National Government	1943		Amir Faisal, Prime Minister	1934	
	O. K. Yui, Prime Minister	1954	South Africa	Ernest George Jansen, Governor General	1951	
China, People's Republic of	Mao Tse-tung, Chairman of the Central People's Government Council	1949		J. G. Strijdom, Prime Minister	1954	
	Chou En-lai, Chairman of the State Administrative Council	1949	Spain	Gen. Francisco Franco Bahamonde, Chief of State (President of the Council of Ministers)	1939	
Colombia	Lieut. Gen. Gustavo Rojas Pinilla, President	1953		Abdullah Khalil, Prime Minister	1956	
Costa Rica	José Figueres, President	1953	Sudan	Gustav VI Adolf, King	1950	
Cuba	Gen. Fulgencio Batista, President	1952	Sweden	Tage Erlander, Prime Minister	1946	
Czechoslovakia	Antonin Zapotocky, President	1953	Switzerland	Hans Struelli, President of the Confederation	1956	
	Vilem Siroky, Chairman of the Council of Ministers	1953		Thomas Holenstein, Vice-President of the Federal Council	1956	
Denmark	Frederick IX, King	1947	Syria	Shukri al-Kuwatli, President	1955	
	Hans Christian Svane Hansen, Prime Minister	1955		Sabri el Assali, Prime Minister	1956	
Dominican Rep.	Gen. Héctor Trujillo y Molina, President	1952	Thailand	Phumiphon Adunet, King	1946	
Ecuador	Camilo Ponce Enriquez, President	1956		Field Marshal Luang Pibul Songgram, Prime Minister	1948	
Egypt	Lieut. Col. Gamal Abdel Nasser, President	1956	Tunisia	Sidi Mohammed el-Amin, Bey	1943	
Ethiopia	Haile Selassie I, Emperor	1930		Habib Bourguiba, Prime Minister	1956	
	Bitwoded Makonnen Endalkatchou, Prime Minister	1944	Turkey	Celal Bayar, President	1950	
Finland	Urho Kekkonen, President	1956		Adnan Menderes, Prime Minister	1950	
	Karl August Fagerholm, Prime Minister	1956	Union of Soviet Socialist Republics	K. E. Voroshilov, Chairman of the Presidium of the Supreme Soviet	1953	
France	René Coty, President	1954		N. A. Bulganin, Chairman of the Council of Ministers	1955	
	Guy Mollet, Premier	1956	United States	Dwight D. Eisenhower, President	1953	
Germany (East)	Wilhelm Pieck, President	1949	Uruguay	Alberto F. Zubiria, Chairman of the Governing Council	1956	
German Democratic Rep.	Otto Grotewohl, Minister-President (Premier)	1949	Vatican City	Pius XII, Pope	1939	
(West) German Federal Rep.	Theodor Heuss, President	1949	Venezuela	Marcos Pérez Jiménez, President	1953	
	Konrad Adenauer, Chancellor	1949	Vietnam	National Republic Ngo Dinh Diem, President	1955	
Great Britain	Elizabeth II, Queen	1952		Democratic Republic	Ho Chi Minh, President	1954
	Sir Anthony Eden, Prime Minister	1955	Yemen	Ahmed ibn Yehya Hamid ed-Din, King	1948	
Greece	Paul I, King	1947	Yugoslavia	Marshal Tito (Josip Broz), President of the Republic and Chairman of the Federal Executive Council	1953	
	Konstantinos Karamanlis, Prime Minister	1955				
Guatemala	Col. Carlos Castillo Armas, President	1954				
Haiti	Paul E. Magloire, President (to Dec. 6, 1956)	1950				
Honduras	Three-man military junta	1956				
Hungary	Istvan Dobi, Chairman of the Presidium of the National Assembly	1952				
	Janos Kadar, Chairman of the Council of Ministers	1956				
Iceland	Asgeir Asgeirsson, President	1952				
	Hermann Jonasson, Prime Minister	1956				
India, Rep. of	Rajendra Prasad, President	1950				
	Jawaharlal Nehru, Prime Minister	1947				
Indonesia	Achmed Sukarno, President	1949				
	Ali Sastroamidjojo, Premier	1955				
Iran	Mohammed Riza Pahlavi, Shahanshah	1941				
	Hussein Ala, Prime Minister	1955				
Iraq	Faisal II, King	1939				
	Nuri es-Said, Premier	1954				
Ireland, Rep. of	Sean T. O'Kelly, President	1945				
	John A. Costello, Prime Minister	1954				
Israel	Isaac Ben-Zvi, President	1952				
	David Ben-Gurion, Premier	1955				
Italy	Giovanni Gronchi, President	1955				
	Antonio Segni, Prime Minister	1955				
Japan	Hirohito, Emperor	1926				
	Tanzan Ishibashi, Prime Minister	1956				
Jordan	Hussein I, King	1952				
	Suleiman Nabulsi, Prime Minister	1956				
Korea (South)	Syngman Rhee, President	1948				
Rep. of Korea (North) Democratic People's Rep. of Korea	Kim Du Bon, Chairman of the Presidium of the Supreme People's Assembly	1948				
	Kim Il Sung, Chairman of the Council of Ministers	1948				
Laos	Sisavang Vong, King	1945				
	Prince Savanna Phuma, Premier	1956				
Lebanon	Camille Shamun, President	1952				
	Sami es-Salh, Prime Minister	1956				
Liberia	William V. S. Tubman, President	1944				
Libya	Idris I, King	1951				
	Mustafa Ahmed ben Halim, Prime Minister	1954				
Liechtenstein	Franz Josef II, Sovereign Prince	1938				
	Alexander Frick, Minister-President	1945				
Luxembourg	Charlotte, Grand Duchess	1919				
	Joseph Bech, Premier	1953				
Mexico	Adolfo Ruiz Cortines, President	1952				
Monaco	Rainier III, Sovereign Prince	1949				
	Henri Soum, Minister of State	1953				
Mongolian People's Republic	Zh. Sambu, Chairman of the Presidium of the Great Khural	1954				
	Yumzhaghiyin Tsendenbal, Chairman of the Council of Ministers	1952				
Morocco	Mohammed V ben Yusuf, Sultan	1955				
	M'Barek ben Mustafa el-Bekai, Prime Minister	1955				
Muscat and Oman	Said bin Taimur, Sultan	1932				
Nepal	Mahendra Bir Bikram, King	1955				
	Tanka Prasad Achariya, Prime Minister	1956				
Netherlands	Juliana, Queen	1948				
	Willem Drees, Prime Minister	1948				
New Zealand	Lieut. Gen. Sir Willoughby Norrie, Governor General	1952				
	Sidney George Holland, Prime Minister	1949				
Nicaragua	Luis Somoza Debayle, President	1956				
Norway	Haakon VII, King	1905				
	Einar Gerhardsen, Prime Minister	1955				
Pakistan	Maj. Gen. Iskander Mirza, Acting President	1956				
	H. S. Suhrawardy, Prime Minister	1956				
Panamá	Ernesto de la Guardia, Jr., President	1956				
Paraguay	Gen. Alfredo Stroessner, President	1954				
Peru	Manuel Prado y Ugarteche, President	1956				
Philippines, Rep. of the	Ramón Magsaysay, President	1953				
Poland	Aleksander Zawadzki, Chairman of the Council of State	1952				
	Josef Cyrankiewicz, Chairman of the Council of Ministers	1954				
Portugal	Gen. Francisco Hignino Craveiro Lopes, President	1951				
	Antonio de Oliveira Salazar, President, Council of Ministers (Prime Minister)	1932				

Prices.

In 1956 the stability of prices which had characterized the economy of the United States since late 1952 appeared to have come to an end. In the course of the second and third quarter of 1956 both the consumer price index and the wholesale price index rose almost continually, and by Sept. 1956 the highest recorded price levels since the beginning of the Korean war were registered in the United States. The rise in prices, although affecting almost all commodities traded in the wholesale and retail field, remained, however, within relatively modest limits. Nevertheless, compared with the third quarter of 1955, consumer prices in the third quarter of 1956 were 2.1% higher and wholesale prices were 3.2% higher. Rises of such magnitude within the span of one year had not occurred in the United States economy since 1952.

These percentage differentials are larger than the annual data presented in Table I, since the averages for the first 10 months of 1956 include also the relatively unchanged prices of the first four months of the year.

Table I.—Wholesale and Consumers' Price Indexes, United States, Selected Years
(1947=49=100)

Year	Wholesale prices	Consumers' prices	Year	Wholesale prices	Consumers' prices
1929	61.9	73.3	1949	99.2	101.8
1933	42.8	55.3	1950	103.1	102.8
1939	50.1	59.4	1951	114.8	111.0
1941	56.8	62.9	1952	111.6	113.5
1943	67.0	74.0	1953	110.1	114.4
1945	68.8	76.9	1954	110.3	114.8
1947	96.4	95.5	1955	110.7	114.5
1948	104.4	102.8	1956 (Jan.-Oct.)	113.8	115.9

Source: U.S. Department of Labor, Bureau of Labor Statistics.

The rising prices were associated with a booming economy in which the growth of national income continued at an unabated rate. As in 1955, during which national income stood higher by more than \$25,000,000,000 or approximately 8% as compared with the preceding year, the national income of 1956 was expected to exceed the 1955 level by at least 6% and possibly by as much as 8%. However, whereas the excess in 1955 over 1954 occurred under a system of stable prices, the real increase in income in 1956 would be less since prices also had advanced.

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Table II—Wholesale Prices, by Groups of Commodities, United States

(Index numbers of the Bureau of Labor Statistics; 1947-49=100)

Other commodities

Year and month	All commodities	Farm products	Processed foods	Total	Textile products and apparel	Hides, skins and leather products	Fuel, power and lighting materials	Chemicals and allied products	Rubber and products	Lumber and wood products	Pulp, paper and allied products	Metals and metal products	Machinery and motive products	Furniture and other household durables	Non-metallic minerals—structural	Tobacco mfrs. and bottled beverages	Miscellaneous
1955																	
August	110.9	88.1	101.9	117.5	95.3	93.8	107.2	105.9	148.7	125.1	119.7	139.5	128.5	116.0	126.1	121.7	89.8
September	111.7	89.3	101.5	118.5	95.4	94.0	108.0	106.0	151.7	125.7	120.5	141.9	130.0	116.4	126.4	121.7	90.3
October	111.6	86.8	100.2	119.0	95.4	95.3	108.0	106.5	147.8	125.4	122.8	142.4	131.4	116.9	126.8	121.7	91.5
November	111.2	84.1	98.8	119.4	95.6	96.4	108.6	106.6	150.6	125.0	123.2	142.9	132.5	117.2	125.2	121.7	88.0
December	111.3	82.9	98.2	119.8	95.6	96.7	109.3	106.6	151.0	125.1	123.6	143.9	133.0	117.3	125.4	121.7	88.8
1956																	
January	111.9	84.1	98.3	120.4	95.7	96.7	111.0	106.3	148.4	126.3	124.8	145.1	133.3	118.0	127.0	121.7	89.6
February	112.4	86.0	99.0	120.6	96.0	97.1	111.2	106.4	147.1	126.7	125.4	145.1	133.9	118.2	127.1	121.7	88.7
March	112.8	86.6	99.2	121.0	95.9	97.7	110.9	106.5	146.2	128.0	126.8	146.5	134.7	118.1	127.9	121.7	88.2
April	113.6	88.0	100.4	121.6	95.1	100.6	110.6	106.9	145.0	128.5	127.4	147.7	135.7	118.0	128.6	121.7	92.1
May	114.4	90.9	102.4	121.7	94.9	100.0	110.8	106.9	143.5	128.0	127.3	146.8	136.5	118.0	128.6	121.6	96.1
June	114.2	91.2	102.3	121.5	94.9	100.2	110.5	107.1	142.8	127.3	127.4	145.8	136.8	118.1	128.9	121.6	92.9
July	114.0	90.0	102.2	121.4	94.9	100.1	110.7	107.3	143.3	126.6	127.7	144.9	136.9	118.3	130.6	121.7	91.3
August	114.7	89.1	102.6	122.4	94.8	100.0	110.6	107.3	146.5	125.4	127.9	150.1	137.7	119.1	130.8	121.7	91.1
September	115.3	89.3	101.5	122.5	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

Source: U.S. Department of Labor, Bureau of Labor Statistics.

The impetus to the rising price level in 1956 probably was given by the early advance of wholesale prices. The wholesale price index had already shown a rising tendency in the summer and early autumn of 1955, but during the late autumn and winter of 1955 wholesale prices had levelled off. By Feb. 1956 they again began to advance and, with the exception of a short break during June and July, continued to advance steadily throughout the year. Retail prices, which had shown a remarkable stability during all of 1954, 1955 and early 1956, began to rise in April 1956.

There were two principal reasons for the price rise in the wholesale field. One was the recovery of agricultural prices, in contrast to their decline in the previous year; the other was the rise of nonagricultural prices, especially of the prices of nonagricultural materials, which began in mid-1955 and continued throughout 1956. The rise of agricultural prices produced first an increase in prices of processed foods, and later in the retail price of food. The main immediate causes for the rise in consumer prices appeared to be the increase in food prices and in the price of services.

The rise in agricultural prices was to some extent related to governmental policies in support of agriculture, but was also in part caused by limited farm marketings of crops and livestock. Thus, since farmers supplied less, and since the Commodity Credit corporation (CCC) did not release sufficient complementary quantities of the principal crops which were subject to price support, total actual supplies outside the CCC were small and hence prices of these commodities firmed up.

While agricultural prices rose by approximately 6% between the winter of 1955-56 and the midsummer of 1956, prices of nonagricultural raw materials rose commensurately, but their primary period of price increase preceded that of agriculture. The United States department of commerce published in July 1956 a comparison of wholesale price differentials between May 1955 and May 1956. During this one-year period wholesale prices of all nonagricultural products had increased by 6%. But the price of steel and iron scrap had risen in the same period by 39.1%, the price of copper by 27.8%, the price of antimony by 15.8%, the price of ferromanganese by 13.1% and the price of aluminum by 11.6%. Next in importance to the price rise of raw metals was a rise in the price of forest products, which resulted in a price increase of paper by 5.7% and of paperboard products by 10.3%.

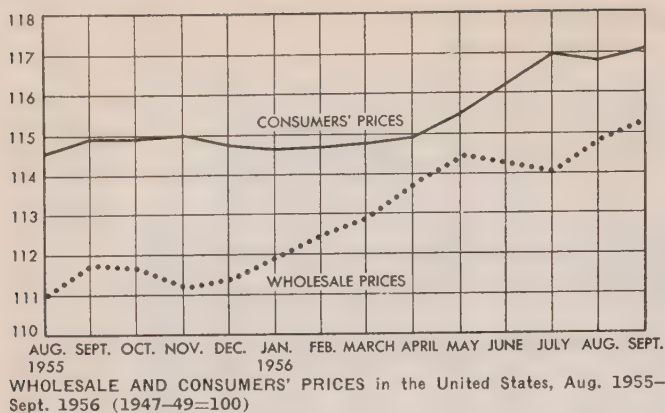
The net result of the price rise of these agricultural raw materials was an advance in the prices of those commodities which contain considerable amounts of metal or paper. This is shown in Table II. The most important increases in wholesale prices occurred in the following industry groups: metals and

metal products, machinery and motive products, lumber and wood products and paper and allied products. Compared with these industries, others such as textiles and apparel, chemicals, rubber and rubber products, tobacco manufactures and bottled beverages experienced a relatively high degree of price stability, or even a slight price decline. Industries which are intermediate between these two extremes are hides, skins and leather products, fuel power and lighting materials, nonmetallic mineral products and processed foods. It is important to bear in mind that the comparisons in raw material prices cited earlier were made in May 1956. But as can be seen from Table II, wholesale prices advanced even further after May, though at a decelerated rate.

The continued gradual increase of wholesale prices was reflected in rising consumer prices. As already pointed out, the two main consumer goods fields in which prices increased most steeply were food and services, particularly medical care and personal care. (See Table III.) There was also a rise in rents and in the costs of operating a household, notably in the cost



"THOSE HOTROD RACERS AGAIN," a cartoon of 1956 by Shanks of the Buffalo Evening News (N.Y.)



of fuel and utilities. The increase in the cost of living, and especially the differential price rise of food and services, had the effect of shifting somewhat the over-all pattern of consumer expenditures. For example, there was an absolute decline in retail sales in the durable goods class by approximately \$350,000,000 per month between the second half of 1955 and the first half of 1956, which was counteracted by an approximate increase of retail sales of nondurable consumers goods. In particular, the total sales of grocery stores and restaurants increased, and their sales in the first half of 1956 were approximately \$240,000,000 per month above the monthly average of the second half of 1955. Another item on which more was spent by consumers in 1956 was services. Whereas total personal consumption expenditures on services in 1955 amounted to \$92,100,000,000, by March 1956 this item of consumption was running at an annual rate of \$96,400,000,000, and later developments indicated that the 1956 total would be nearly \$100,000,000,000.

The increases in expenditures for food and services were due not only to their rising prices but also to the growth of population. Therefore, the increase in 1956 expenditures over 1955 expenditures in these fields could have been expected even if prices had remained stable. The significant fact was the decline in expenditures in durable goods during 1956. In the face of rising prices of automobiles, for example, the people of the United States curtailed their total expenditures on automobiles, and one of the chief reasons for the rather drastic changes in external appearances of most 1957 automobiles may have been this elasticity of demand in the face of higher prices. The same elasticity of demand did not appear in connection with sales of other durable commodities, and household appliances, furniture and lumber and hardware sales not only maintained their 1955 level but even exceeded it.

The main danger of a rising cost of living is its effect upon wages and through them upon a further rise in prices. One of the consequences of the rise in consumer prices in 1956 was the settling of the steel strike under conditions providing for a rise in wages, which would have repercussions on steel prices

by early 1957. Steel is a commodity of such wide use, and steel-making capacity is so fully employed, that any rise in steel prices is bound to lead to further price increases of commodities made from steel. Some estimates of the over-all effect of the prospective rise in steel prices suggested that it might lead during 1957 to an increase in the cost of living by 2% to 3%.

(See also CONSUMER CREDIT; FEDERAL RESERVE SYSTEM.)
(B. F. H.)

Great Britain.—The price situation in Britain was by no means unfavourable during 1956, at least until toward the close of the year. Industry was required to absorb, not only higher freight and labour costs following a round of wage increases early in the year, but also increases of 5% in steel prices in May

Table IV.—World Prices; British Commodity Prices*

	1955		1956	
	Aug.	Nov.	Feb. May	Aug.
World prices (average 1952=100)				
All items	95	94	95	92 93
Food	93	90	90	89 92
Fibres	81	78	83	83 81
Metals	98½	102	108	99 97
Other	113	111	104	101 103
British commodity prices				
Cocoa, London terminal, £ per ton	245½	251	207	197½ 225
Tea, Ceylon, London auction, d. per lb.	57.42	67.57	55.86	74.67 59.23
Rubber, R.S.S., spot, d. per lb.	39½	37¾	31¾	25¾ 30¾
Wool, tops, 64's, d. per lb.	118	108	111	119 128
Copper, electro, £ per ton	364	379¾	398½	347 304½
Lead, soft, £ per ton	105¾	107½	120½	111½ 117½
Zinc, g.o.b., £ per ton	89¾	92½	100½	95 95¾
Tin, cash, £ per ton	754½	785½	806½	750¾ 774

*World price index based on 17 price series (6 food, 4 fibres, 4 metals, 3 others).
Source: Economist (London) and United Nations Monthly Bulletin of Statistics.

and of 8% in pit-head prices of coal in June. That it did so with no more than modest increases in prices of manufactured products was the result of increased productivity, aided by a relative stability in prices of materials (except fuels) used in industry. By August the prices of basic industrial materials were little, if any, higher than a year before, and the same was true of the prices of imported materials and manufactures.

As in the two previous years, ex-factory prices of manufactures generally rose quite slowly in 1956. Such products as clothing and household textiles remained at much the same price level as in 1954–55 and, even when prices were rising rather faster (e.g., chemicals), the increase over 1954 was generally under 10%. Exports showed the same continued but moderate increase in prices. Against this, imports first increased and then (in midyear) declined in price. Consequently, the terms of trade, never much worse than the constant level of 1953–55, actually improved in the middle months of 1956.

Even so, the critical situation as regards the gold and dollar reserves and the balance of payments of the sterling area persisted into 1956. Toward the end of the year there was a loss of confidence in sterling following military action at Port Said. Most prices were then rising, not only those of imports but also of domestic manufactures. There remained doubts about the continued ability of British industry to absorb increased

costs with real possibility of further wage increases to come and to compete successfully with other industrial countries in export markets. Moreover the costs, direct and indirect, of the Suez crisis had not been fully counted by the end of the year.

Other Countries.—In 1954 and 1955 the movements of prices and costs had been less in countries such as the United States, Belgium, Switzerland

Table III.—Consumers' Price Index, United States Average, All Items and Commodity Groups
(Bureau of Labor Statistics index for city wage earner and clerical-worker families; 1947–49=100)

Year and month	All items	Foods	Housing	Apparel	Transportation	Medical care	Personal care	Reading and recreation	Other goods and services
1955—August	114.5	111.2	120.0	103.4	125.4	128.0	115.8	106.3	120.4
September	114.9	111.6	120.4	104.6	125.3	128.2	116.6	106.7	120.6
October	114.9	110.8	120.8	104.6	126.6	128.7	117.0	106.7	120.6
November	115.0	109.8	120.9	104.7	128.5	129.8	117.5	106.8	120.6
December	114.7	109.5	120.8	104.7	127.3	130.2	117.9	106.8	120.6
1956—January	114.6	109.2	120.6	104.1	126.8	130.7	118.5	107.3	120.8
February	114.6	108.8	120.7	104.6	126.9	130.9	118.9	107.5	120.9
March	114.7	109.0	120.7	104.8	126.7	131.4	119.2	107.7	121.2
April	114.9	109.6	120.8	104.8	126.4	131.6	119.5	108.2	121.4
May	115.4	110.0	120.9	104.8	127.1	131.9	119.6	108.2	121.5
June	116.2	113.2	121.4	104.8	126.8	132.0	119.9	107.6	121.8
July	117.0	114.8	121.8	105.3	127.7	132.7	120.1	107.7	122.2
August	116.8	113.1	122.2	105.5	128.5	133.3	120.3	107.9	122.1
September	117.1	113.1	122.5	106.5	128.6	134.0	120.5	108.4	122.7

Source: U.S. Department of Labor, Bureau of Labor Statistics.

Table V.—Import, Export and Wholesale Prices, U.K.

	1955		1956	
	Aug.	Nov.	May	Aug.
(Average 1954=100)				
Import and export prices*				
Imports, all items	102	104	105	106
Food, beverages, tobacco . .	97	100	100	103
Basic materials	105	104	105	105
Fuels	102	104	107	106
Manufactures	110	111	115	112
Exports, all items	102	103	105	106
Metals	103	107	110	111
Engineering Products	103	105	104	105
Textiles	99	98	100	99
Other manufacturers	102	104	105	105
Terms of trade	100	101	100	97
(Average 1954=100)				
Wholesale prices†				
Basic materials	109	107	108	109
Fuels used	114	115	115	116
Food manufactured products . .	103	104	104	105½
Nonfood manufactured products .	104	105	107	108
Iron and steel	108	108	108½	113
Chemical	101	104	105	106
Clothing and footwear	99	100	100	101
Other textile	97	95	96	97
Furniture	101	104	105	105
Electrical appliances	101	101	101	102
(June 1947=100)				
Retail prices and wages‡				
Retail prices, all items	149	154	153	157
Wage rates, men	151	152	156	163

*Board of trade index numbers calculated from selected headings in the monthly trade returns; terms of trade as ratio of import to export prices, a fall indicating a favourable movement.

†New series (monthly averages) of board of trade, switched to average 1954=100; basic materials were for use in nonfood manufacturing (excluding fuels).

‡Ministry of labour series; mid-month for retail prices, end-month for wage rates.

Source: Board of Trade Journal and Ministry of Labour Gazette.

Table VI.—Wholesale Prices in Certain Countries
(1953=100)

	1955			1956	
	June	Sept.	Dec.	March	June
United States					
Crude materials	97	96	91	94	96
All items	100	101	101	102	104
Europe					
Belgium	101	101	102	103	103
Denmark	102	104	106	107	108
France	96	99	100	101	102
German Federal Republic*	100	101	101	102	102
Italy	101	100	102	103	102
Netherlands	101	101	102	104	104
Norway	103	104	105	106	110
Sweden	103	105	107	109	110
Switzerland	101	101	101	102	104
United Kingdom:					
Basic materials	103	107	107	107	106
Manufactured products	103	105	106	108	108
Commonwealth					
Australia†	102	103	103	105	109
Canada	99	100	100	101	103
India	87	90	94	98	101
New Zealand	100	100	101	102	104
South Africa	103	105	105	105	105

*Industrial products. †Domestic products.

Source: United Nations Monthly Bulletin of Statistics.

and the German Federal Republic than elsewhere. The feature of 1956 was that the price increases were much more nearly uniform in the main industrial countries. The upturn in prices, for manufactured goods entering into international trade, is seen in the following index numbers calculated by the United Nations Statistical office:

	Export prices, 1953=100				1956	
	1955				1st	2nd
Quarter of year	1st	2nd	3rd	4th	1st	2nd
Manufactured exports: world . . .	98	98	99	101	102	000
All exports: U.S. and Canada . . .	99	100	100	101	103	000
Western Europe:						
U.K. and Ireland	99	100	101	102	103	000
Continental	97	98	98	100	101	000

No important industrial countries avoided a mildly inflationary movement (Table VI); everywhere there was pressure for higher wages under full-employment conditions. There was, perhaps, a rather more rapid rise in prices in Scandinavia than in the German Federal Republic, but scarcely more than can be explained by particular circumstances or by the varying construction of available index numbers.

(See also AGRICULTURE; BANKING; BUILDING AND CONSTRUCTION INDUSTRY; BUSINESS REVIEW; FOREIGN INVESTMENTS; INCOME AND PRODUCT, U.S.; INTERNATIONAL TRADE; STOCKS AND BONDS; WAGES AND HOURS.) (R. G. D. A.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Big Enterprise and the Competitive System* (1954); *Competition and Big Business* (1953); *Inflation* (1953).

Prince Edward Island. Canada's smallest province (2,184 sq.mi.), Prince Edward Island lies in the Gulf of St. Lawrence. It was established as a colony in 1769 and it joined confederation in 1873. Population: (1951 census) 98,429, (1956 est.) 108,000. Capital and only city, Charlottetown, pop. (1951 census) 15,887, (1956 est.) 16,446. There is one town, Summerside, pop. (1951 census) 6,547, (1956 est.) 7,115, and the following incorporated municipalities: Souris, pop. 1,183, Montague 1,068, Tignish 926, Kensington 811, Georgetown 762, Borden 690, Alberton 674, O'Leary 657.

History.—The outstanding events of 1955 were the provincial general election on May 25 which returned the Liberal government of Premier A. W. Matheson with the support of 27 of the 30 seats in the legislature, and the 100th anniversary of the incorporation of the city of Charlottetown. The latter event was marked by numerous ceremonies, celebrations, conventions and competitions, and attracted the largest influx of tourists in the history of the province. Production was normal during 1956 and no major economic changes occurred. Rural electrification was extended into many districts. The construction industry was very active: the new trans-Canada highway was completed from Borden to Charlottetown and a beginning was made on the second stage, from Charlottetown to Wood Islands. A large new federal building in Charlottetown and other new construction gave the building trades an unusually busy year.

Education.—There were 250 university students, 894 high school students and 19,716 elementary school pupils enrolled in all public and private institutions for the school year 1954-55. There were 800 teachers, and the total provincial government expenditure on education was \$2,306,006.39.

Public Health and Welfare.—For the year ending March 31, 1956, the federal government paid out \$2,616,640 in family allowances on behalf of 36,166 children in 13,276 families; and \$3,305,879 in old-age security pensions to 6,909 pensioners. The provincial government in the year ending March 31, 1956, paid out \$202,170 in old-age assistance payments to 601 recipients; \$43,039 in pensions to 102 blind persons; and \$115,992 in assistance to 310 disabled persons. In the same period mothers' allowances and assistance for 774 children under 16 years of age in 273 families totalled \$78,613. Total benefits for the year were \$6,362,333.

Transportation and Communications.—In 1956 there were 13,436 passenger cars and 6,142 trucks using the 3,194 mi. of provincial roads, of which 363 mi. were paved, 1,406 mi. were improved, 1,410 mi. were unpaved, and 15 mi. were national park roads. There were two airports, one at Charlottetown and one at Summerside. Two ferry systems connect the province with the mainland. The Canadian National railway serves the island with 286 mi. of track. The Maritime Central airways runs regular passenger and freight service. The Sydney Motor Transport company runs a regular bus service to the mainland. As of Sept. 30, 1956, there were 14,554 telephones in use.

Banking and Finance.—On March 1, 1956, there were 23 branches of chartered banks doing business in the province. Gross fund of debt of the province was \$19,300,000, less sinking funds of \$4,163,924. The net fund of debt was \$15,136,076; the unfund of debt \$5,124,935. Total liabilities amounted to \$20,251,011. At March 31, 1954, there were 57 credit unions with assets of \$1,187,656.

Agriculture.—During 1955 the farm cash income was \$25,489,000. The wheat crop was valued at \$128,700; oat crop \$2,826,250; barley \$75,600; potatoes \$5,912,500; hay \$4,940,500. In 1955 there were 125,000 cattle; 61,000 swine; 39,700 sheep and lambs; and 930,000 domestic fowl. The value of mixed grains was \$2,516,150; dairy products \$4,354,000.

Fisheries, Furs and Forestry.—During 1955 fisheries statistics indicated that 47,314,800 lb. of fish were landed at a value to the fisherman of \$3,278,952 and a market value of \$4,700,000. There were 11,382,400 lb. of Irish moss gathered with a value of \$142,404. Trapping resulted in \$72,000 worth of fur pelts. The value of forest products was \$367,000.

Manufacturing.—Latest available statistics were for 1954, when there were 1,798 employees in 224 plants earning \$22,954 in salaries and wages. Finished products were: butter and cheese \$3,793,000; fish processing \$3,220,589; prepared livestock and poultry feed \$1,238,344.

(F. MacK.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Maritime Provinces of Canada* (1943); *Prince Edward Island* (1955).

Principe: see PORTUGUESE OVERSEAS TERRITORIES.

Printing. Perhaps the most startling development in the graphic arts industry during 1956 was the actual entering into business of two companies¹ with equipment for

¹The Merrywell Systems, New York, N.Y.; Arrow Graphic Co., New York, N.Y.

producing telephone directories, price lists, other listings and certain types of catalogues by what is called "cold typesetting," photomechanical platemaking methods and offset printing. The evenly justified lines of type are composed on an electric typewriter,² called the recorder, in punched tape form. The tape is transferred to a reproducer machine in which the evenly justified lines are typed automatically on a strip of cardboard—one, two or three lines of type to the card. The strip is then passed through a die-cutting machine³ which automatically dies out the cards at 100 per minute to a size of $7\frac{3}{8}$ in. wide by $3\frac{1}{4}$ in. high by 0.007 in. thick, with the upper right-hand corner cut off diagonally. The one, two or three lines of typed copy or even some part of a design are contained on each card. The cards are passed through a coding machine⁴ where small slots are punched into them. These slots act as detectives for the sorting or collating machine so that they will be in proper order, not only for filing purposes for future use, but also for reproduction in an ultra-rapid automatic Listomatic camera. The oblong slots on the right side of the card indicate data for the job, alphabetical listing, etc. The slot or slots more nearly in the centre of each card "tell" the Listomatic camera how many lines of type are to be photographed in the film. The camera will photograph cards automatically on the sensitized film at the rate of 230 per minute. The camera can be adjusted to photograph type lines from the same size (12 point) down to 50% reduction. The resulting exposed film is developed and stripped into page form for offset or photoengraved printing plates.

Development of an impressionless printing press called an electronic reproducer, or "smoke printer," was announced.⁵ Its initial application was for producing business forms. The image of the copy to be reproduced is projected to a sheet of glass coated with a series of metals which have the ability to change light energy to electrical energy. This vertically positioned glass plate, in front of which the paper is continuously fed, contains a facsimile of the copy (either line or continuous tone) in the form of electrical charges rather than a visual light image. In a chamber facing the charged image, finely atomized pigment particles are sprayed through a high-voltage field where each particle is charged opposite in polarity to the electrical image on the glass plate. The difference in polarity causes the plate to attract the charged pigment particles. Because the paper web travels between plate and pigment particles, the flight of the particles is interrupted. The pigment particles become embedded in the paper to a depth dependent upon the amount of electrical charge. The rate of production of $8\frac{1}{2}$ in. by 11 in. printed sheets was 3,600 per. hour.

There was a definite trend toward the installation of small-size offset production presses⁶ as distinguished from the offset duplicating type of equipment. These are furnished in 14 in. by 20 in. size. The presses are built like larger offset production presses.

Expanding the versatility of the Scan-A-Graver, Fairchild Graphic Equipment, Inc., Jamaica, N.Y., developed an electronic device called the Variable Response unit for almost infinite control over the tonal qualities in the photographic copy from which halftone plastic printing plates are made. That is, by using the new unit, the operator can adjust it for partially correcting poor density values in original copy, type of ink and paper to be used and condition of the printing press, and in case the engravings are to be stereotyped great improvement in printing can be obtained. In the Variable Response unit, the electrical scanning information is converted to lighting information and

then reconverted to electrical information. This is done by means of a flying spot scanning tube very similar to a television tube. It was pointed out that local correction work in a photograph cannot be obtained with the unit. The same change in tonal value applies across the entire piece of copy. Thus the modification of tonal values in one section of the copy applies to equivalent densities in the remaining part of the copy.

One of the important improvements in ink drying was that of a quartz tube heating element.⁷ The elements resemble tubes, and the effective heating width is 25 in. These drying elements may be assembled in a conveyor, printing press or other machine to cover any width sheet or web speed. Besides the ink drying function, the elements can be used for treating and conditioning coatings on paper, fibre and textiles. The drier is especially effective with synthetic resins which react favourably under high flash heat, as well as with impregnating processes using lattices or impregnating compounds. The quartz drier elements come up to temperature quickly when the electricity is turned on. The quartz-enclosed elements cool off quickly when the machine is stopped, thus greatly reducing any fire hazard. One of the properties of the element is that the heat is permitted to pass through the quartz wall without the latter's getting hot.

Refinements in offset platemaking processes worthy of mention were as follows: Lithographic Technical foundation, Chicago, Ill., reported that the foundation had spread the difference between the water receptivity of the image area so far that it was now able to make plates without any grain at all. While not many plants were using ungrained plates, the general trend was toward finer and finer grains. A method for making a fourth or black plate for the short-run three-colour offset process was developed by Eastman Kodak Co., Rochester, N.Y. The black plate is made by a simple method from the three colour separations. (M. St.)

ENCYCLOPEDIA BRITANNICA FILMS.—*The Book* (1955); *Modern Lithographer* (1940); *Story of Printing* (48 minutes) (1950); *Printing Through the Ages* (13 minutes, short version) (1950).

Prisons. The year 1956 was one of comparative quiet and some notable progress in prisons of the United States. The destructive riots and group uprisings which first broke out in many of the state prisons across the country in 1952 subsided during 1956 with only a few sporadic incidents. In the Maine state prison, a group of prisoners set fire to several of the institution's shops in an attempt to fight their way to freedom, and in the Connecticut state prison a sit-down strike was staged by several hundred prisoners in protest against poor food, lack of recreation and harsh disciplinary treatment. Some prisoners of the Georgia prison system broke their legs with sledge hammers to avoid working in the prison rock quarry.

Many states, especially those which experienced serious prison riots in the past few years, undertook substantial improvements in their prison systems. Massachusetts, Ohio, Missouri, Minnesota, Florida and several others reorganized and strengthened their state prison systems under centralized state control. Connecticut had a new state prison in the blueprint stage and Delaware established for the first time a state correctional system. There were also the beginnings of an encouraging interest in the potential values of prison camps and similar "open-type" institutions for the younger and more reformable type of prisoner. This interest in the open-type institution was influenced to a large extent by the success of the California program and its institution at Chino, Calif., and by that of the Federal Correctional institution at Seagoville, Tex.

The prison population generally throughout the country continued its upward trend in 1956, but at a slower rate. At the end of 1955, there were 185,069 persons in state and federal

²Commercial Controls Corp., Rochester, N.Y.

³The Standard Register Co., Dayton, O.

⁴International Business Machines Corp., New York, N.Y.

⁵Huebner Company, Dayton, O.

⁶Harris-Seybold Co., Cleveland, O., and Miehle Printing Press & Mfg. Co., Chicago, Ill.

⁷The J. E. Doyle Co., Cleveland, O.

Sentenced Prisoners in U.S. Prisons and Reformatories

(Dec. 31 of each year)

Year	Federal Institutions	State Institutions	Total	Rate per 100,000 Population
1955	20,088	164,981	185,069	114.0
1954	20,003	162,048	182,051	114.4
1953	19,363	153,366	172,729	110.6
1952	18,014	149,360	167,374	109.2
1951	17,395	147,501	164,896	109.1
1950	17,134	148,662	165,796	110.4
1949	16,868	146,474	163,342	110.7
1948	16,328	138,764	155,092	106.8
1947	17,146	133,719	150,865	105.8
1946	17,622	121,813	139,435	100.8
1945	18,638	114,581	133,219	104.4

prisons and reformatories, an increase of slightly more than 3,000 over the previous year. However, the rate of increase during 1955 was only 1.7% as compared with a rate of 3.2% increase in 1953 and 5.4% in 1954. It was believed that this might represent the beginning of a levelling-off in the rapid increase in prison population during the past 10 years. For the first time since 1951, court commitments to state and federal institutions decreased; there were 77,503 new commitments during 1955 as compared with 79,946 in 1954, or a reduction of more than 3%.

While the federal prison system was free of any group disturbances or uprisings which had plagued so many of the state institutions, it was seriously affected by the growth in prison population. The federal prison system comprised 29 institutions located in 19 states and the District of Columbia. The total capacity of these institutions was about 19,000 prisoners, but the population of the federal institutions at the close of 1955 was 20,088. Nevertheless, the institutions were closely integrated and classified to provide appropriate custody, care and treatment for many types of offenders. The federal system included 6 penitentiaries, 5 reformatories, 7 correctional institutions, 6 camps, a medical centre, a detention or jail facility, a youth centre for adolescent offenders, a training school and a forestry

camp for juvenile delinquents.

For the fiscal year 1955-56, the federal bureau of prisons administered a total appropriation of \$30,092,000 for salaries, maintenance of plant and equipment, care of prisoners and for the operation of an extensive rehabilitation program. On a per capita basis, this amounted to \$4.07 per prisoner per day. The rehabilitation program included classification, casework services, medical and psychiatric treatment, religious counseling, education and vocational training and a wide program of employment and industrial production.

The latter program was operated by Federal Prison Industries, Inc., organized as a government corporation but administered as an integral part of the federal prison system. During the fiscal year, this industrial production program employed about 18% of the total prison population and produced goods for sale only to other government agencies, valued at \$20,810,656. Out of the earnings, the corporation paid to inmates employed in the shops \$1,247,842 in wages, which were sent to dependents or kept for the inmates in anticipation of their release, and also financed entirely the costs of the vocational training program. In addition, the corporation returned to the U.S. treasury \$4,000,000 for fiscal 1955-56, which brought to \$32,500,000 the total for the past 10 years. (See also CRIME.) (J. V. BE.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Inside Story* (1952).

Prizes and Awards of 1956: see LITERARY PRIZES; NOBEL PRIZES; PULITZER PRIZES. See also AMERICAN LIBRARY ASSOCIATION; ANTHROPOLOGY; GEOGRAPHY; MINERALOGY; MOTION PICTURES; RADIO AND TELEVISION; ROMAN CATHOLIC CHURCH; SOCIETIES AND ASSOCIATIONS, U.S.; etc.

Production, Industrial: see BUSINESS REVIEW.

Profits, Company: see BUSINESS REVIEW.

Protestant Episcopal Church. Statistics given by the *Episcopal Church Annual* at the beginning of 1956 showed moderate gains under all headings except ordinations and postulancy. The total number of baptized persons was 3,013,570, an increase of 106,249 over the previous year. The number of communicants, 1,865,915, represented an increase of 49,304. The decline in the number of parishes reported the previous year was reversed, the total number, 8,053, being an increase of 141. There were 7,573 ordained clergy at the beginning of 1956, an increase of 206 over the preceding year. The number of lay readers was 9,545, an increase of 919. The church schools had 696,028 pupils, an increase of 17,093, and 80,819 teachers, an increase of 4,958. Total receipts came to \$131,354,945.37, an increase of \$5,822,423.70.

The gain in infant baptisms was slight, the total of 98,595 being only 340 more than the previous year, but the record of adult baptisms was somewhat better, increasing by 1,344 to a total of 20,388. The number of confirmations was 113,443, an increase of 9,429. The ratio of clergy to communicants had risen slightly from 1 to 246.7 to 1 to 246.4, but the decline in ordinations and postulancy created the fear that this improvement might not continue in the future. A total of 415 persons were ordained to the diaconate, a decrease of 3, and 354 to the priesthood, a decrease of 34. There were 677 candidates for the ministry, a gain of 11, while the number of postulants (those preparing to become candidates) was 1,182, a decrease of 13.

Discussions of reunion were carried on with representatives of the Methodist Episcopal Church, but the proposals were still in the tentative stage. A delegation was sent to study the interesting experiment in Christian unity being made by the Church of South India. Reports from China indicated that the church there had survived the revolution in better shape than had been supposed.



"PRE-RELEASE" CENTRE installed at Missouri State penitentiary in Dec. 1955. Two weeks before being paroled, prisoners are permitted to spend their leisure hours watching television or playing games, a program designed to prepare them for normal life outside of prison

Liturgical developments included an increased use of the "westward position" (the priest facing the people) in the celebration of the Holy Communion, and the development of a family service, usually held between the early and late Sunday morning services, as a part of the program of religious education. This service might take the form of Holy Communion, morning prayer or a special service might be used.

(See also CHURCH MEMBERSHIP.)

(W. W. Ms.)

Prunes: see FRUIT.

Psychiatry. Psychiatry in 1956 commemorated the 50th anniversary of the birth of Sigmund Freud by reviewing and assaying the contributions of the founder of psychoanalysis. Although controversy among psychiatrists concerning the significance of Freudian theoretical concepts continued, integration of the left wings of both camps appeared to be taking place, particularly in the United States, under the compromise term "dynamic psychiatry." Some right-wing traditionalists still denied the existence of unconscious mental processes, and some right-wing psychoanalysts still quoted the hypotheses of Freud as if they were facts, but they were gradually becoming outnumbered by their younger colleagues who challenged many of Freud's formulations in the same spirit of free inquiry that made possible Freud's greatness.

Dynamic psychiatrists, however, continued to look beyond Freud in their exploration of the many facets of human behaviour. Isolated in past years to state hospitals or institutes of psychoanalysis, by 1956 psychiatric research was pursued extensively in medical schools and comprehensive training centres.

In 1956 a research team of psychiatrists, sociologists, anthropologists, psychiatric social workers and statisticians began to report the results of four years' exploration of the extent of mental health problems in a section of a large U.S. city. They found a higher degree of emotional distress than had been anticipated, differentially distributed among socioeconomic segments of the population in such a way that the groups needing the most psychiatric treatment were receiving the least.

A major problem was the shortage of psychiatrists in all fields—research, teaching and practice—in spite of efforts of governmental and private philanthropic organizations to assist and encourage physicians to enter the specialty of psychiatry. There were many reasons for the lag in recruitment; one major deterrent was the high cost and lengthy duration of a program which included psychoanalytic training. No short cuts in the training program had demonstrated their practicality.

The years since World War II had witnessed a struggle by psychiatrists to gain recognition for their specialty in undergraduate medical curriculums. For the most part, in the United States, this struggle had been successful, and departments of psychiatry were receiving recognition, budgetary support, teaching opportunities and departmental autonomy in most of the major medical schools. As the departments became securely established, many of them shared leadership in the development of plans for integrated teaching of comprehensive medicine, based on the realization of the importance to all physicians of comprehending the patient's total adaptation in all of its social and emotional as well as physical relationships. Such comprehensive medical programs were being developed and extended in many areas in 1956.

The search for chemical short cuts to treatment in psychiatry continued in 1956. The so-called tranquillizing drugs received enthusiastic support from some psychiatrists and equally strong condemnation from others. They appeared to have a definite place in the treatment of some agitated hospitalized psychotic patients, but their role in outpatient treatment of psychoneu-

rotic patients remained in question. The indiscriminate use of tranquillizing drugs, often without prescription, began to be a major public health problem. Educational measures had been invoked in an attempt to bring the sale and use of the tranquillizing drugs under safe control, but their efficacy was still in question.

Newer concepts of legal responsibility in criminal cases were supported by the United States court of appeals for the District of Columbia in the case of *Durham v. United States*. For more than a century the responsibility of a criminal had been determined primarily by the McNaghten rule—the test of the defendant's awareness of right and wrong—or in some areas by the irresistible impulse standard. Neither of these criteria remained satisfactory in the light of the development of psychiatry and of co-operation between psychiatry and the law. In *Durham's* case the court stated that "an accused is not criminally responsible if his unlawful action was the product of mental disease or mental defect." Psychiatrists generally welcomed this decision as a major step forward in facilitating their contribution to the understanding and disposition of defendants in criminal cases.

(See also PSYCHOLOGY; PSYCHOSOMATIC MEDICINE.)

(C. K. A.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Alcoholism* (1952); *Drug Addiction* (1952).

Psychology. Psychology in 1956 extended its international character with experimental and theoretical papers, monographs, and discussion conferences representing the work of United States, Australian, European, Indian, Japanese and South African scientists, with a few contributions from staff members of educational institutions of the near east. Techniques and points of view varied with the breadth of this field of science and not with national or continental boundaries, except for some differences in the relative influence of outstanding theoreticians and in facilities for specific kinds of experimentation. The majority of publications were in English, but there was a growing need in psychology for experts in other European and Asian languages.

General Experimental Psychology.—Psychologists generally, but especially those in Europe, were showing concern over the development of more comprehensive theoretical formulations to guide research. Jan Smedslund of Norway, in a monograph on *Multiple-Probability Learning*, parted company with both S-R learning theory and Gestalt theory without discarding the experimental data previously obtained in these contexts. The experiments which Smedslund reported were designed to provide data with sufficiently broad implications to permit generalization to real-life situations. The method required a more refined quantification of the frequency with which cues appeared in the environment and how they correlated with each other and with specific consequences of behaviour. The applicability of this theory substantiated the promise of E. Brunswik's formulation of perceptual learning. A person's knowledge of the physical world and the development of social behaviour were regarded as being dependent upon a multiple-probability learning process. Older theories of learning and cognition had been based on an oversimplified conception of stimulus. J. S. Bruner, J. J. Goodnow and G. A. Austin used a closely parallel approach to even more complex material in *A Study of Thinking*.

Comparative Psychology.—New strength appeared in a pure science area of psychology, the study of animal behaviour. Many more papers on the genetics of behaviour were being published and were being presented at meetings or research conferences. From England came a book by W. H. Thorpe, *Learning and Instinct in Animals*, in which the author co-ordinated his theories of innate factors and learning processes into the most comprehensive survey of the capacities of various animals for behav-

journal modification to appear in the last 20 years. Work of Thorpe and his collaborators, and of E. H. Hess in the United States, revealed that imprinting in animals shared more properties of other forms of behavioural modification than was originally thought. The early stages of imprinting showed generalization and a degree of reversibility. The earlier alleged all-or-none character of imprinting needed qualification in the light of new data.

Developmental Psychology.—Some research on children was oriented toward theory-testing, some toward fact finding, and much toward practical problems of education and adjustment. F. L. Goodenough and L. M. Rynkiewicz' *Exceptional Children* reported facts and practical procedures related to gifted children as well as the handicapped. In *Three Determinants of Attention-Seeking in Young Children*, a monograph of the Society for Research in Child Development, J. L. Gewirtz presented data from an experimental study which tested several hypotheses about the development of social motivation in children of pre-school age. This study was representative of a trend which had gained momentum gradually during the past decade, favouring studies of individual and group differences which were predicted from certain assumptions about the effects of growth and of child-rearing practices.

Personality and Social Psychology.—Problems in motivation, social and self perception, personality measurement and political behaviour were of primary concern to many research workers in 1956. One study demonstrated a direct relationship between perceptual sensitivity for faces (as opposed to familiar inanimate objects) and the affiliation motive. Quantitative methods were finding increasing acceptance and application in experiments where intuitive appraisals were formerly considered the only approach possible. Personal and social needs of individual members of university athletic teams or of representative members of certain interest groups were being specified in precise mathematical terms. A new quarterly, *Behavioral Science*, was founded in Jan. 1956 for the publication of articles on behaviour theory having implications for mental health.

Physiological Psychology.—In recent years psychologists had become increasingly active in clarifying concepts and discovering new facts about innate drives and the development of derived forms of motivation. Behavioural studies used both persons and animals for measuring the parameters of selective and energizing factors in activity. Physiological investigations contributed new information during 1956 on "centres" in the nervous system; techniques for implanting electrodes or small hypodermic tubes through the skulls of experimental animals were proving valuable. These methods made it possible to stimulate electrically or chemically and to record from discrete brain loci, to determine behavioural correlates of such stimulation and to then make accurate microscopic determinations of the region involved. One study published in May 1956 reported that local chemical stimulation of the "medial preoptic area" produced in male rats complete maternal behaviour sequences. Other work on "rewarding" effects of electrical brain stimulation showed that activation of certain midbrain, hypothalamic or primitive forebrain centres would induce animals to repeat whatever actions they had made just at the time the current was turned on. One effective technique led rats, cats or monkeys to press a bar that momentarily turned on the stimulus hundreds of times in an hour. Other locations were found whose stimulation caused animals to avoid repeating such acts.

Applications.—Industry, government, schools, hospitals and the armed services were employing increasing numbers of specialists, some of them occupied in research that was several steps removed from the solution of an immediate practical problem. Two 1956 books of particular interest to students of personnel

problems were Anne Roe's *The Psychology of Occupations* and Ross Stagner's *The Psychology of Industrial Conflict*.

Specialists in human engineering were being sought by industrial houses and by various technical branches of the armed services. The typical request was for men trained in basic sciences, experimental design and statistics, and the psychology of sensation, perception and motor skills.

Many workers were engaged in the improvement of educational, clinical and specialized aptitude tests whose practical usefulness was well recognized. An important research contribution to the field of psychological measurement appeared in *A Study of Adoptive Children* by J. R. Wittenborn and eight collaborators (Psychological Monographs, 1956). The attempt was made to evaluate both the children and their homes and to uncover the basic factors contributing to the child's development.

(See also PSYCHIATRY; PSYCHOSOMATIC MEDICINE.)

(A. H. R.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Emergence of Personality Series* (series of five films) (1948); *Mental Health* (keeping mentally fit) (1952); *Personality and Emotions* (1955); *Why Vandalism?* (1955); *Yale Clinic Child Development* (series of 11 films) (1934); *Your Children's Sleep* (1950).

Psychosomatic Medicine. In 1956 the field of psychosomatic medicine turned its attention to a study of basic concepts and methodology. The previous pattern of reporting specialized aspects of psychosomatic phenomena continued, but the significant trend was a re-examination of the basic methods of conducting a psychosomatic study.

Viewed historically, such a trend was much to have been expected. References to mind-body relationships appear in the literature of ancient Greek medicine, but psychosomatic medicine as a field for scientific investigation began only about the time of World War I. The work of Sigmund Freud in psychoanalysis and Walter B. Cannon in physiology gave rise to the initial investigations. In the ensuing four decades a considerable mass of material was accumulated demonstrating the role of psychological factors in various illnesses—high blood pressure, peptic ulcer, arthritis, etc. Physiology was likewise making significant advances. The psychological work was very often detailed in its field, the physiological in its field, but all too often there was not sufficient collaboration. There seemed to be a tacit assumption that psychosomatic was essentially equal to psychogenic—i.e., originating in a mental process. At one time it was thought that a specific psychological constellation (a personality type) would be discovered for specific psychosomatic illnesses; for example, it was thought that repressed rage was specific for high blood pressure, dependency for peptic ulcer, etc. These observations had validity in their own right but were not sufficiently broad to explain a psychosomatic occurrence.

Now the increased emphasis is on the role multiple factors play in producing a psychosomatic illness. The psychological and physiological aspects have been mentioned, but heredity and socioeconomic factors are also known to be important. These four factors—the psychological, the physiological, the hereditary and the social (or cultural)—were the main lines along which the major endeavour of psychosomatic research was proceeding during 1956. This means not that the points of vantage were limited to these four as a specific and irrevocable number but that they represented a convenient way for organizing thought.

This more comprehensive approach was often spoken of as the "field theory." This term was borrowed from physics to describe part-whole relationships. The essential components of this approach are the focusing on a "field" with observation of the various component parts. In order to derive adequate data, the observers usually must be trained in various scientific dis-

ciplines. A comparison might be drawn with the process of analyzing a photograph of a person in an outdoor setting. One observer, focusing on the person, can draw certain conclusions about that person from his facial expression, mode of dress, etc. Another observer, trained in another discipline, can say something about the geographical area in which the photograph was taken from observing the vegetation. Still another observer may be able to describe weather conditions at the time the picture was taken from observing clouds in the background, and so on. The conclusions are limited principally by the number, skill and variety of orientations of the observers.

There is yet another aspect of this picture which must be included if this is going to describe adequately a psychosomatic situation. This is the transaction of one part with another. For this type of observation a still photograph is not sufficient; a motion picture is necessary. For example, a transaction takes place if the clouds in the background bring rain and the person in the picture must adapt to this new circumstance. This idea of motion and transaction naturally makes the situation infinitely more complex, but this is true of life and psychosomatic situations.

Peptic ulcer may be selected as a specific illustration of the application of the "field" concept in psychosomatic medicine. (These premises had not been conclusively proved, but they were suggested by current work, particularly that of I. A. Mirsky.) It was found that there is a circulating hormone, pepsinogen, which tends to be present in greater than average quantities in patients with peptic ulcer. Pepsinogen levels vary considerably from person to person, and at different times in the life of a given person. Furthermore, infants shortly after birth vary in the quantity of circulating pepsinogen, presumably because of hereditary factors. The pepsinogen level is related directly to the secretory activity of the stomach, particularly the acid secretion, which is an important predisposition to peptic ulcer. Consider a particular infant who at birth has a higher than average level of pepsinogen, and assume that this means greater than average stomach activity and more complexity in his early feeding. The hereditary, or genetic, factor can be seen to be the predominant one at this point. Suppose that this infant is reared by a mother who is sufficiently adaptive and flexible to satisfy the feeding demands of an "ordinary" baby but who cannot adapt herself to this special child. Her activity, of course, is determined in this regard by past and present cultural factors of her own life, her own psychological make-up and the specific environmental situation (the presence of other children, etc.). As a result of his unsatisfied tensions the child, in turn, may react against the mother, creating further tension in her and thus in the long run creating a more than usually complex mother-child relationship. This, then, becomes important to the psychological development of the child as he grows into adulthood. Even this degree of complexity of factors is not sufficiently complex to lead to the development of a peptic ulcer. Assume, then, that a significant event takes place in the life of this person. It might, for example, be induction into the military services, where additional demands, changes in diet and feeding routine, etc., finally create sufficient stress to produce a clinical illness, a peptic ulcer. No one factor—heredity, early environment, cultural expectations, psychological make-up or current life situation—can be said to be the single cause of the peptic ulcer. Each has a validity and an importance in its own right.

Viewed in this manner, psychosomatic medicine emerges as a broad field, encompassing many disturbances of health, not just a few specific illnesses. It is impossible, of course, for any single investigator to be skilled in all fields of observation. Because of this there was considerable interest and emphasis on the

"team" approach. This means a collaboration of skills from varied areas—physiologist, biochemist, psychiatrist, social scientist—to study and understand not only particular points of view but the more important whole. A special area of development is the correlation of psychological processes and structural changes with the "in-between" processes which transmit this interaction. These researches lead particularly into the fields of endocrinology and neurophysiology. Paul MacLean was studying that part of the brain between the oldest part, the spinal cord, and the newest part, the cortex (the highest thinking centre). This area is called the "visceral brain" because it has an important regulatory function over the organs of the body (viscera) where psychosomatic disturbances take place. Basic research was seeking to determine the importance of the hormone epinephrine (adrenalin) in anxiety states. A hormone of more recent discovery, nor-epinephrine, was being studied for its possible role in aggressive feelings and high blood pressure.

These were a few of the advances in neurophysiology and endocrinology. Their importance was not in terms of isolated phenomena but in their role in the total processes. In 1956 the emphasis in psychosomatic medicine was the study of multiple factors in causation, by a team of experts, using the field approach. (See also PSYCHIATRY.)

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Public Assistance: see CHILD WELFARE; SOCIAL SECURITY.

Public Health Engineering. Growing interest in atmospheric pollution problems in the United States in 1956 was signified by further development of federal, state, municipal and industrial programs in pollution control. Increased attention was directed to public health problems associated with the peacetime use of nuclear energy. However, practicable means for disposal of high-level radioactive wastes, suitable for use by private industry, had not been developed. A basis for permanent, strengthened federal activity in water pollution control was provided in public law 660 enacted by the 84th congress.

Community Air Pollution.—The broadened national program in air pollution control was characterized by expanded epidemiological and toxicological studies of specific pollutants; and by establishment of a central research facility in Cincinnati, O., at the public health service's Robert A. Taft Sanitary Engineering centre. Legislative action was initiated in many additional states to provide for the definition and control of atmospheric pollution. Interest in automobile exhaust fumes as an important component of irritating smogs led the automobile industry to undertake intensified research for the control of these emissions. The Los Angeles (Calif.) Air Pollution Control district enlarged its study of the role of household refuse incinerators in that area's air pollution problem. A smog occurrence in southern England, suggestive of the 1952 episode which was believed to have killed 4,000 people, emphasized the need for the Clean Air bill recently enacted by the British government.

Radiological Health.—The need for developing practicable control measures for radiation hazards became increasingly urgent with expansion of interest in the peaceful uses of atomic energy. Methods for protection against such hazards represented an important part of the program of the first Nuclear Energy and Science congress, held in Cleveland, O. An important guide to understanding and evaluating radiological health problems was provided by the National Academy of Sciences in its report,

"The Biological Effects of Atomic Radiation." Continued research was devoted to the disposal of high-level radioactive wastes by permanent fixation of fission products on silicious materials before burial, and by disposal in the ocean.

Sewage and Waste Disposal.—Enactment of public law 660 gave the public health service responsibility for development of a permanent federal program in water-pollution control. New features of general interest included simplified procedures for enforcement of pollution abatement in interstate waters, and stimulation of sewage treatment works construction by grants to municipalities. Interest in waste stabilization ponds for inexpensive, complete sewage treatment increased as additional information on design criteria and performance was reported. Research on plastics as bio-oxidation surfaces drew attention to the possible advantages, over conventional biological treatment devices, of lightweight materials with large surface area to volume ratios and high porosities. Interest in the use of wet combustion processes to treat a variety of liquid wastes followed reports on the successful application of this method in treating waste sulphite liquor. Modification of sewage treatment process design to permit handling of industrial wastes indicated a growing trend toward industrial use of municipal facilities as an economical method of industrial waste disposal.

Water Supply.—Recommendations on federal policy in development of U.S. water resources were contained in the report of the President's Advisory Committee on Water Resources Policy. The committee recognized the need for integrating municipal and industrial water-supply planning and water-pollution control into the over-all water resources development plan. Emphasis was placed on the need for strengthening programs of collection and evaluation of basic data, with special attention directed to deficiencies in knowledge of the chemical and biological quality of the nation's waters. Increasing concern with the need to conserve surface and ground waters for essential uses became evident in expanded research in spreading of flood waters to charge underground reservoirs, in the use of recharge wells, in desalination and in evaporation control. The feasibility of reduction of evaporation from reservoirs by use of monomolecular films was under investigation by the Southwest Research institute in Texas and by the bureau of reclamation in Denver, Colo., and in Oklahoma City, Okla. Interest in the use of synthetic organic flocculating agents, polyelectrolytes, in municipal water treatment increased as their effectiveness was demonstrated in the precipitation of finely divided suspended solids in industrial wastes. An outbreak of 7,000 cases of infectious hepatitis in New Delhi, India, reported to have been water-borne, drew attention to the need for evaluating the reliability of conventional water treatment processes in removing viruses. A program of controlled shalldarking of plastic pipe was initiated by the National Sanitation foundation, school of public health, University of Michigan, Ann Arbor, following tests on the suitability of such pipe in plumbing systems.

Milk and Food.—Interest in the problem of wholesomeness of poultry led to the development of standards for use by states and municipalities, and to congressional hearings on several bills calling for mandatory federal poultry inspection. Application of ionizing radiation for food preservation was brought closer to commercial realization by progress toward pilot plant studies. The development of a new colorimetric assay for paralytic shellfish poisoning and the use of a new reference standard increased the reliability of public health control of clams and mussels. Increased use of dry milk solids pointed to the need for revised standards for the control of the sanitary quality of this milk product.

Industrial Hygiene.—The physiological effect of environmental heat exposures was the subject of intensive study by sev-

eral agencies. Interest in occupational health hazards of the agriculture industry led to pilot field studies conducted co-operatively by federal and state agencies and university departments. Research in control of industrial noise continued with progress being made in correlating hearing loss with noise exposures. The public health service's occupational health program initiated a series of training courses in evaluation and control of industrial noise exposures for supervisory and health personnel of industry.

Vector Control.—Goals of malaria control programs throughout the world were elevated as a result of awareness of the necessity for and feasibility of malaria eradication using DDT and dieldrin residual sprays. A large scale nation-wide malaria eradication program was initiated in Mexico with joint financing by the Mexican national government, the World Health organization and the United Nations Children's fund. The role of mosquitoes in virus propagation was emphasized by the isolation in a single year of 31 previously unknown viruses from seven different genera of mosquitoes by the Trinidad Regional Virus laboratory. Earlier laboratory indications that houseflies developed resistance to organophosphate insecticides were substantiated for the first time in the field in reports from Denmark.

Refuse Disposal.—An increasing number of U.S. communities were using improved methods of refuse disposal. Incineration and sanitary landfill remained the commonest practices in municipal refuse disposal, with more than 70% of the urban population of the U.S. being served by these methods. However, installation of garbage grinders became increasingly popular, leading to predictions that, within ten years, 50% of the urban population would be using this method of disposal. By Oct. 1956, regulations controlling the feeding of food wastes to swine had been adopted by 46 states containing 90% of the U.S. population.

(See also ACCIDENTS; EPIDEMIOLOGY; PUBLIC HEALTH SERVICE, U.S.; WORLD HEALTH ORGANIZATION.) (B. B. BR.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Cities—How They Grow*, 2nd ed. (1953); *City Water Supply* (1941); *The Baltimore Plan* (1953); *Defending the City's Health* (1941).

Public Health Service, U.S. The principal federal health agency, the public health service of the U.S. department of health, education and welfare, continued during 1956 its program of research, medical care for specially designated groups and technical assistance to state and local health agencies.

During the year, responsibility for several new programs or for the expansion of existing programs was vested in the public health service. Among the most important of these were the National Library of Medicine, a continuing national survey of sickness and disability in the United States, a three-year, \$90,000,000 research construction grant program, and a program of federal assistance for graduate training of more professional nurses and public health personnel and for vocational training of practical nurses.

The year saw a great increase in the use of the Salk poliomyelitis vaccine, in whose testing and release the public health service played a major role. Studies of the effectiveness of the vaccine were conducted in co-operation with the states and territories, and findings indicated that it would reduce the risk of polio by about 75%. There were about half as many cases of polio in 1956 as in 1955; totals at the end of the third quarter for the U.S. were 11,503 cases for 1956, compared with 21,751 cases for 1955. (See POLIOMYELITIS.)

The Nation's Health Record.—The general death rate in the United States in 1955 was 9.3 per 1,000 population. This was the eighth consecutive year that the death rate had been below 10 per 1,000.

The infant death rate was estimated at 26.5 per 1,000 live births, and the maternal death rate was estimated at 4.8 per 10,000. The tuberculosis death rate dropped from 10.2 per 100,000 population in 1954 to 9.1 in 1955. The principal diseases of childhood, scarlet fever and streptococcal sore throat, diphtheria, whooping cough and measles, which caused about 10 deaths per 100,000 population under 15 years of age in 1945, were responsible for about 2 deaths per 100,000 population in 1955.

Major heart and blood vessel diseases accounted for 54% of deaths in 1955, and cancer for 16%.

Decreases were reported in the number of cases of infectious hepatitis, infectious encephalitis, measles, poliomyelitis, scarlet fever and streptococcal sore throat, psittacosis, diphtheria and typhoid fever. Malaria continued to decline. Small increases were reported in the number of cases of whooping cough, bacillary dysentery and salmonella infections.

There were an estimated 4,041,000 births and 1,524,000 marriages in 1955. (See also BIRTH STATISTICS; DEATH STATISTICS; INFANT MORTALITY.)

Research.—Important among research events during the year was an 80% increase by congress in the appropriation for the National Institutes of Health, main research arm of the public health service, to \$184,400,000.

Research activities during the year included the expansion of the cancer chemotherapy program, the beginning of a new program of research in cerebral palsy and the co-ordination of several research programs in aging.

In 1956 final data were obtained on the pilot project in Memphis, Tenn., to determine the usefulness of a cell examination test for cancer of the uterine cervix (neck of the womb). The test, which was made on most of the female population of Memphis, identified this cancer at an early stage at 40 times the previous rate of identification. The test was being tried in eight other cities.

Among some of the specific research accomplishments associated with the National Institutes of Health or with institute-supported work were an improved safety test, using monkeys, for the poliomyelitis vaccine; a means of preventing galactosemia (a deadly disease of infancy); new drugs for rheumatoid arthritis; a vaccine for two strains of APC virus; new surgical techniques for the treatment of congenital heart disease; a technique to determine the nutritional needs of cancer cells; and the finding of chemical means to break down the components of a virus and then reconstitute it.

Medical Services.—The public health service continued to provide medical services for merchant seamen and other federal beneficiaries, and to assist other federal agencies in providing needed medical care. The service maintained 16 hospitals, including 2 for treatment of narcotic addiction, 1 for tuberculosis and 1 for the treatment of leprosy; 23 outpatient clinics and 100 outpatient offices.

August 1956 marked the tenth anniversary of the Hospital Survey and Construction act. More than 2,300 hospital and medical facilities had been constructed during the past 10 years, including 600 new health centres, and 800 additional facilities were being built or were approved for construction. Congress extended this program for a 2-year period.

To carry out its new responsibilities for the health needs of the American Indians, the service employed 100 additional medical and dental officers, and 500 other health workers. The service operated 52 general hospitals and 4 tuberculosis hospitals for American Indians in 13 states and Alaska.

Services to the States.—Federal appropriations for grants-in-aid for state and local health services totalled \$22,438,000 in 1956, a slight increase over the 1955 appropriation. Special grants were authorized to develop new methods of care for the men-

tally ill, to help improve the administration and services in mental hospitals, to help improve mental health care in Alaska and to assist the states in purchasing polio vaccine.

A program was established to help states develop migratory labour and rural health services.

Thirty-three radiation monitoring stations were set up and equipped to record the effect of nuclear weapons testing, as a safeguard to the public. Civil defense training programs for sanitary engineers and other public health officials were conducted in all parts of the country. Air pollution research was greatly expanded.

New legislation authorized grants to state and interstate water pollution control agencies and also grants to municipalities for construction of sewage treatment works.

In its international health activities, the service staffed health programs in 42 foreign countries and aided 886 people from 22 countries who came to the U.S. for training in 51 fields of health study.

(See also EPIDEMIOLOGY; INDUSTRIAL HEALTH.)

(L. E. BY.)

Public Libraries: see AMERICAN LIBRARY ASSOCIATION; LIBRARIES.

Public Utilities. **Legislation.**—In the United States a dearth of important federal legislation affecting public utilities characterized the year 1956. Several important issues were embodied in legislative proposals but all were vetoed by Pres. Dwight D. Eisenhower.

After the decision (1954) of the United States supreme court in the Phillips Petroleum case declaring that producers of natural gas for transportation and sale in interstate commerce were subject to regulation by the Federal Power commission, the Harris-Fulbright bills were introduced in the 84th congress. These bills exempted independent natural gas producers from the direct jurisdiction of the Federal Power commission. The Harris bill passed the house during the first session. The senate, in the second session, also passed the Fulbright bill by a 53-38 vote, despite the disclosure by Sen. Francis P. Case (S.D.) that an undisclosed party had made what looked like an improper attempt to influence his vote. The president, while expressing sympathy for the merits of the bill, vetoed it on moral grounds.

The Democratic majority of congress also passed legislation which would have frozen wholesale rates charged for electric energy by the Southwestern Power administration in the department of the interior. This was done in order to forestall a 40% increase in these rates by the executive branch of the government, an event much feared by the municipalities and co-operatives of the region distributing such wholesale energy at retail. An earlier report by the Southwestern Power administration had suggested that these rates were too low to be compensatory. President Eisenhower vetoed the bill on the ground that sound management required that rates for electric power from federal projects be adequate to repay the taxpayers' investment with interest and within a reasonable time. The veto message also indicated that the congressional proposal offended the president's conception of the division of powers between congress and the executive.

In an unprecedented election year act, the president also withheld his approval, after congress had adjourned, of the annual rivers and harbours bill. This bill authorized the expenditure of \$1,600,000,000 and covered 99 projects and 14 river basins, the improvements being scattered throughout the United States. The basis for the rejection was that congress had acted on incomplete information. He regretted vetoing the bill because it contained many worthwhile projects, but it also contained projects upon which congress had acted without getting complete

reports from the corps of engineers in contravention of the policy as laid down by congress in the River and Harbor and Flood Control act of 1954 to the effect that reports should be previously submitted by the chief of engineers. He also objected that some projects involved too little local participation in meeting expenditures, which participation he felt was the "best test yet devised" of their economic soundness.

The legislature of Maine repealed the widely known Fernald law of 1909 which had embargoed the export of hydroelectric power. The law was designed to keep the hydraulic power for home consumption in the hope of attracting new industry. Since Maine, as contrasted with other New England states, has an abundance of surplus water power, the prohibition of its interstate transmission and sale had hindered the economical integration of the region's electric power supply sources. Through exports Maine utilities would then be able to combine their surplus hydroelectric power, especially during good water years, with the steam-electric power of surrounding states and to supplement their own deficiency during poor water years by importing the more economical steam-generated energy from their out-of-state neighbours.

Court Decisions.—On Oct. 9, 1956, the federal circuit court of appeals of Washington, D.C., refused to reverse the decision of the Federal Power commission granting a licence to the Idaho Power company (*National Hell's Canyon Association, Inc., et al. v. Federal Power Commission*, no. 12,988 and 13,160). The licence authorized the construction of a multipurpose project in the Hell's canyon reach of the Snake river according to a three-dam plan proposed by the company. The association and certain public utility districts operating in the watershed opposed the grant on the ground that it was the duty of the commission under the Federal Power act to decide that the United States undertake the development by recommending to congress that it authorize the construction of a single high dam in Hell's canyon. This single-dam plan had been recommended by the corps of engineers of the department of the army and by the reclamation bureau of the department of the interior. The complainants also contended that the company's proposal was not "best adapted to a comprehensive plan" for developing the water resources of the site for public purposes, as the Federal Power act also required.

The court replied that the Federal Power act left this determination to "the judgment of the commission." Citing the Roanoke Rapids decision of the United States supreme court, the lower court held that the act vested the commission with a broad discretion in deciding questions where there was conflicting engineering and economic evidence. The commission had concluded that public purposes inhering in flood control, navigation and recreation could be effectuated to about the same extent under either plan of development. As to power production, the commission had compared the economics of the two proposals and had chosen the private company's plan for which private capital amounting to \$175,000,000 was immediately available so that construction could begin at once. The public proposal involving a \$400,000,000 expenditure, though promising somewhat greater public benefits, had not been authorized by congress. Since the commission in deciding the issue had not violated constitutional or statutory provisions, the court decided that its action must stand.

Reports.—A most significant report was issued by the President's Advisory Committee on Water Resources Policy under the chairmanship of the undersecretary of interior, Clarence A. Davis. The committee consisted of cabinet members of the interior, defense and agriculture departments, together with certain ad hoc members, the secretaries of health, education and welfare and of commerce and the director of the budget. The

attorney general's department and the Federal Power commission were likewise consulted.

The committee's first recommendation was that adequate funds should be provided for a continuing program to gather basic data having to do with the meteorology, hydrology, geology and topography of the United States. The second recommendation was that since there could be no uniform national blueprint for water resource conservation, the planning therefore should flow as a result of collective judgment by regional resource committees with the president appointing a permanent nonvoting chairman. Other members would be representatives of federal agencies having existing responsibilities and individuals appointed by the governors of participating states. Also, that there should be established in the executive office of the president a permanent office of co-ordinator of water resources. It should be his duty to co-operate with all relevant agencies in working out long-range programs. The report further recommended the setting up of an independent board of review consisting of economic and engineering specialists, who would evaluate the program in the light of congressional policies, but that no projects be undertaken without congressional authorization.

Other recommendations related to studies of the complex subject of water rights, systems of priorities of use, ways of evaluating projects, the determination of costs and the sharing of such costs by beneficiaries.

(M. G. G.)

Canada.—Toward the close of 1956, the largest current project in Canada, the building of a 2,500-mi. (\$400,000,000) natural gas pipeline from the oil fields of Alberta to the consumer markets of Ontario and Quebec, still lacked over-all financing. This was despite the fact that the federal government and that of the province of Ontario were to assume the cost of building and temporary ownership of the long and unproductive link through the sparsely inhabited regions of Manitoba and western Ontario, against later repayment and assumption of ownership by Trans-Canada Pipe Lines. Moreover, in order to allow a start on the project the federal government, in the spring of 1956, advanced \$80,000,000 to the company for building the first section from Edmonton, Alta., to Winnipeg, Man. This section was not expected to be completed before late summer 1957. For lack of finance no work had been undertaken on the 335-mi. line from Toronto to Montreal, Que., which, pending the arrival of gas from western Canada, was supposed to serve this territory with natural gas from Louisiana. Doubt was expressed as to whether the pipeline could be profitably operated as a private enterprise until such time as the U.S. Federal Power commission would permit the import of Trans-Canada gas into the United States. Government policies regarding the pipeline became the object of sharp attack by the opposition parties, which made the 1956 session of the Canadian parliament the stormiest in decades.

In 1955, 423 mi. were added to the 5,000-mi. network of oil pipelines, and 285,000,000 bbl. were shipped through the trunk lines as against 209,000,000 bbl. in 1954. In the first eight months of 1956 shipments were again 24% ahead of the previous year.

Canada's railways carried 15.3% more revenue freight in 1955. Operating revenues of the Canadian Pacific railway amounted to \$488,300,000 against \$461,000,000; those of Canadian National railways to \$683,000,000 against \$641,000,000. In the first ten months of 1956 freight car loadings were 11% greater than the year before. Freight transported through all Canadian canals at 34,900,000 tons accorded a 16% increase over 1954. Civil air carriers flew 48,600,000 revenue miles as compared with 40,900,000 in 1954, and a similar rate of gain was registered in the early part of 1956.

The power production of central electric stations rose from an average monthly rate of 5,761,000,000 kw.hr. in 1954 to 6,358,000,000 kw.hr.

The largest telephone utility, Bell Telephone Company of Canada, added 229,000 telephones to its system during 1955 bringing the total to 2,523,000. The operating revenues of the telegraph and cable systems increased by \$1,100,000 to a record \$34,900,000 in 1955.

All public utilities invested \$1,041,000,000 in new facilities as against \$1,124,000,000 in 1954. They were planning to spend a record \$1,582,000,000 during 1956. (R. Rr.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*City Water Supply* (1941); *Development of Communications*, 2nd ed. (1955); *Gas for Home and Industry* (1949); *Light and Power* (1955); *Story of Communications* (1955); *Water Power* (1937).

Publishing: see BOOK PUBLISHING AND BOOK SALES; NEWSPAPERS AND MAGAZINES.

Puerto Rico. A self-governing commonwealth in the West Indies voluntarily associated with the United States, Puerto Rico is the smallest and easternmost island of the four Greater Antilles, which together with the Lesser Antilles form a chain of about 200 islands beginning south of the tip of Florida and extending to the northeastern coast of Venezuela. Puerto Rico has an area of 3,435 sq.mi. Pop. (1950 census) 2,210,703; (1956 estimate) 2,276,000. Chief cities (1950 census): San Juan, the capital, 224,767; Ponce, 99,492; Mayagüez, 58,944; Caguas, 33,759; and Arecibo, 28,659. Language: Spanish; English also taught in the schools.

History.—Among the important legislative actions of 1956 were the passages of the Excise act, providing for drastic revisions of excise taxes charged by the government on various commodities, from automobiles to refrigerators; and the Minimum Wage act, which, after careful study of a number of industries, provided for a general upward revision of wages.

The fiscal year 1955-56 was marked by the formal dedication of the 400th new factory established in Puerto Rico since 1948, with help from the government, and by Development week, to celebrate the fact that, during the year, the total income from manufacturing for the first time surpassed that from agriculture.

A total of 878 official observers, visitors and trainees from 80 different countries went to Puerto Rico during the year for varying periods of time, to study details of the commonwealth's economic, social and political development.

Hurricane "Betsy" struck Puerto Rico Aug. 12, 1956, destroy-

ing many homes and doing damage to agricultural crops estimated at more than \$25,000,000, and to industrial plants at about \$1,000,000.

The chief commonwealth officers for 1955-56 were: governor, Luis Muñoz Marín; president of the senate, Samuel R. Quiñones; speaker of the house of representatives, Ernesto Ramos Antonini; chief justice of the supreme court, A. Cecil Snyder; secretary of state, Roberto Sánchez Vilella; secretary of justice, José Trias Monge; secretary of the treasury, Rafael Picó; secretary of education, Mariano Villaronga; secretary of labour, Fernando Sierra Berdecia; secretary of public works, Roberto Sánchez Vilella; secretary of health, Juan A. Pons; secretary of agriculture and commerce, Luis Rivera Santos; comptroller, Rafael de J. Cordero; director of the Economic Development administration, Teodoro Moscoso; president of the planning board, Cándido Oliveras; director of the bureau of the budget, José R. Noguera; head of the Office of Cooperative Development, Ramón Colón Torres; superintendent of police, Ramón Torres Braschi.

Education.—Enrolment for the school year 1955-56 in public and private, day and night schools totalled 694,619, made up as follows: elementary, 486,120; secondary, 167,084; and special classes for adults, 41,415. Of the total population 6-18 years of age, 81% was enrolled. Public and private day schools enrolled 591,061, while 103,558 were enrolled in night and vocational schools. The number of public school teachers was 12,336.

Resources available for public elementary and secondary schools, vocational education and rehabilitation and related services during 1955-56 were estimated as follows: from commonwealth sources, \$49,045,000, from federal sources, \$9,545,000; total, \$58,590,000.

The University of Puerto Rico enrolled more than 14,000 students. Other institutions of higher learning were: Polytechnic institute at San Germán; College of the Sacred Heart at Santurce; Catholic university at Ponce; and Puerto Rico Junior college at Río Piedras.

Banking and Finance.—On June 30, 1956, the 13 banks and the various branches reported assets of \$474,544,000; total deposits, \$344,189,653; total bank loans, \$266,424,722; and bank debits, \$427,063,975.

The commonwealth government revenues concerning central government purposes during the fiscal year 1955-56 totalled \$181,132,833, of which \$146,866,725 was received into the general fund; the balance represented special funds. Total appropriations for central government purposes, from all funds, amounted to \$195,810,278, of which \$160,733,796 was general fund appropriations.

The commonwealth government net debt as of June 30, 1956, was estimated at \$43,300,000. The net income of the Puerto Rican economy during fiscal year 1955-56 was estimated at \$1,003,500,000. The assessed valuation of all taxable property on June 30, 1956, totalled \$1,044,400,000.

Trade.—During the fiscal year ended June 30, 1956, the value of all merchandise exported amounted to \$406,282,010, of which \$389,961,587, or 96%, comprised shipments to the United States.

The value of inbound merchandise totalled \$629,980,737, of which \$567,935,382, or 92%, represented shipments from the United States.

Communications.—As of June 30, 1956, a total of 116,346 motor vehicles was registered. The total length of all highways and roads in use throughout the commonwealth was 6,403 km. Arrivals to and departures from the commonwealth totalled 700,253, with 380,950 passengers coming and 319,303 leaving the island. There were 58,202 telephones in service. A total of 4,576 vessels with a net registered tonnage of 15,516,395 entered the 11 ports of the island.

Agriculture.—Yields of the major agricultural crops during 1955-56 were: sugar cane, 10,306,432 short tons; tobacco, 300,000 cwt.; coffee, 309,000 cwt.; the estimates of the pineapple crop were 30,369 short tons. Total farm value of the agricultural production was estimated at \$217,326,000.

Manufacturing.—Output of the most important industrial products during fiscal year 1955-56 was: raw sugar, 1,143,986 short tons; refined sugar, 217,656 short tons; blackstrap molasses, 56,900,385 gal.; distilled spirits, 5,044,334 proof gal.; beer, 13,308,779 gal.; rum, 4,346,723 wine gal.; portland cement, 4,093,759 bbl. of 376 lb. each. The total value of building permits granted was \$74,417,322. Electric power generated totalled 1,135,992,473 kw.hr., of which 21% was hydroelectric power.

(J. R. N.)

Mineral Production.—The accompanying table shows the tonnage and value of those minerals produced in Puerto Rico in 1953 and 1954 whose

Mineral Production of Puerto Rico

(In short tons, except as noted)

Mineral	1953		1954*	
	Quantity	Value	Quantity	Value
Total		\$11,156,000		\$11,463,000†
Cement (bbl.)	3,641,000	9,335,000	3,682,000	9,663,000
Lime	7,000	157,000	8,000	198,000
Salt	13,000	131,000	9,000	98,000
Sand and gravel	227,000	250,000	375,000	834,000
Stone	648,000	1,237,000	835,000	1,575,000
Other Minerals	...	46,000	...	155,000

*Preliminary.

†Total has been adjusted to eliminate duplication in the value of clays and stone.

Source: U.S. Bureau of Mines.



HURRICANE WRECKAGE in a street of Yabucoa, P.R., after the second major hurricane of 1956 swept through the town Aug. 12, leaving more than 20,000 persons homeless

value exceeded \$100,000, with the exception of salt, which in 1954 almost reached it.

ENCYCLOPÆDIA BRITANNICA FILMS.—*Puerto Rico* (1955).

Pulitzer Prizes. The annual Pulitzer prizes in journalism, letters and music, first awarded in 1917, were established at Columbia university by the will of Joseph Pulitzer. The five prizes in letters, of \$500 each, were awarded in 1956 as follows: fiction, to MacKinlay Kantor for *Andersonville*; biography, to Talbot Hamlin for *Benjamin Henry Latrobe*; history, to Richard Hofstadter for *The Age of Reform*; poetry, to Elizabeth Bishop for *Poems: North and South—A Cold Spring*; and drama, to Frances Goodrich and Albert Hackett for *The Diary of Anne Frank*.

Journalism prizes (\$1,000 each except for the award for meritorious public service, which is a gold medal) were awarded as follows: for meritorious public service rendered by a U.S. newspaper, to the *Watsonville Register-Pajaronian* (Calif.) for its courageous exposure of corruption in public office; for distinguished editorial writing, to Lauren K. Soth of the *Des Moines Register and Tribune* (Ia.) for an editorial inviting a farm delegation from the Soviet Union to visit Iowa "which led directly to the Russian farm visit to the United States"; for a distinguished example of local reporting under pressure of deadline time, to Lee Hills of the *Detroit Free Press* (Mich.) for his coverage of the United Automobile Workers' negotiations with the Ford Motor company and General Motors corporation for a guaranteed annual wage; for a distinguished example of local reporting not under pressure of a deadline, to Arthur Daley, sports columnist of the *New York Times*, for his outstanding coverage and commentary on sports in his daily column. The award for a distinguished example of reporting on national affairs went to Charles L. Bartlett, Washington correspondent of the *Chattanooga Times* (Tenn.), for the original disclosures that led to the resignation of Harold E. Talbott as secretary of the air force; for a distinguished example of reporting on international affairs to a team of three men, William Randolph Hearst, Jr., editor in chief of the Hearst newspapers, Kingsbury Smith, vice-president and general manager of the International News Service, and Frank Coniff, editorial assistant to Hearst, for a series of exclusive interviews with leaders of the Soviet Union described as "the most remarkable mission in postwar journalistic history"; for a distinguished cartoon, to Robert York of the *Louisville Times* (Ky.) for his cartoon "Achilles," showing a bulging figure of American prosperity tapering to a weak heel labelled "Farm Prices."

The prize for the outstanding example of news photography went not to an individual photographer but to the *New York Daily News* for its "consistently excellent" news picture coverage in 1955, with its photograph "Bomber Crashes in Street" cited as an outstanding example.

The \$500 prize in music was awarded to Ernst Toch, composer and teacher of composition at the University of California, for *Symphony Number 3*. The \$1,500 travelling art scholarship was awarded to Carol Maringer Benson of Cleveland, O.

(A. J. RR.)

Pulp Industry: see PAPER AND PULP INDUSTRY.

Pyrite: see MINERAL AND METAL PRODUCTION AND PRICES.

Qatar: see PERSIAN GULF STATES.

Quakers: see FRIENDS, RELIGIOUS SOCIETY OF.

Quarles, Donald A(ubrey) (1894-), U.S. secretary of the air force, was born at Van Buren, Ark., on July 30, and took his bachelor's degree at Yale university in 1916, specializing in mathematics. He served as an artillery officer in France during World War I. In 1919 he joined the engineering division of Western Electric company—later the Bell Telephone laboratories—of which he became vice-president in 1948. In 1952, he was named vice-president of West-

ern Electric and president of Sandia corporation, a subsidiary of Western Electric. In 1946-47 he was the Republican mayor of Englewood, N.J. On July 28, 1953, he was appointed U.S. assistant secretary of defense for research and development, in which office he supervised the development of new weapons, especially intercontinental and other types of guided missiles. He also was a key figure in the plans for the earth-circling artificial satellite scheduled for launching in 1957-58.

Quarles was named by Pres. Dwight D. Eisenhower on Aug. 11, 1955, as secretary of the air force. He declared before the senate's armed services subcommittee on June 26, 1956, that proposed extra appropriations of about \$500,000,000 for the air force were not necessary in his opinion, because the U.S.A.F. was already the world's "most powerful striking force."

Quebec. Largest province in Canada, Quebec has an area of 594,860 sq.mi. and extends westward from the Gulf of St. Lawrence, along the lower St. Lawrence river. Pop.: (official est., 1955) 4,521,000; French language 82%, British origin 12.1%, other 5.9%. Capital: Quebec city, pop. (official est., 1955) 283,420. Largest city: Montreal, pop. (metropolitan area, official est., 1956) 1,630,000.

History.—The government of Premier Maurice Duplessis, an alliance of Conservatives and dissident Liberals, was re-elected for five years in a general election on June 20, 1956, winning 72 out of 90 legislative assembly seats, the Liberal opposition retaining only 20. Duplessis continued his vigorous defense of provincial autonomy against the federal government at Ottawa. Quebec continued to collect an income tax on personal and corporation incomes, and late in 1956 refused an offer of federal grants to Quebec universities on grounds that education is a provincial matter.

Economic progress was, however, more prominent than political affairs. The year 1956 marked both commencement and substantial headway in the construction of that portion of the St. Lawrence seaway that lies in Quebec. The start was made at Montreal port with cofferdams forming a sea wall to permit dredging and excavating of a deepwater ship channel so that larger seagoing ships would be able to pass through Lachine rapids to Lake St. Louis and the upper St. Lawrence. These works were being extended beyond the Beauharnois power dam to join with the international section of the seaway at Cornwall, Ont. Other economic developments included work on the construction of a new Canadian National railways line east through the virgin bushland from Beattyville, on the transcontinental line, into the important copper-zinc mining field of Chibougamau.

In the Lac St. Jean industrial area, Eastern Mining & Smelting Co. was building a large copper smelting plant, which would process copper and zinc ore from the mines in the Chibougamau field. In the St. Lawrence lowlands, an area lying between Montreal and Quebec city on both sides of the St. Lawrence, major oil companies were actively exploring with drill rigs as well as geophysical survey teams.

Aluminium Company of Canada, already established with a large plant at Arvida, planned to build a \$200,000,000 extension of facilities at Île Maligne. British Aluminium Co. planned an installation costing \$130,000,000 at Baie Comeau. Steel Corporation of Canada was going to spend \$15,000,000 in Pontiac county plant, and Thurso Pulp and Paper Co. was to build a \$17,000,000 plant at Thurso. Hydroelectric power installations during 1956 totalled 193,000 h.p., with work in progress on further installations totalling 2,555,000 h.p.

The value of construction work carried out in Quebec in 1955 totalled \$1,183,706,000, eight times that of 1945. Estimated total of construction for 1956 was \$1,240,000,000.

Education.—Primary school figures for 1952 (latest available in 1956)

showed 734,102 pupils and 31,785 teachers. There were 6,431 students in normal schools, 16,124 students in secondary classical colleges and 40,228 students in universities. The government budgeted \$60,000,000 for educational purposes in 1955-56.

Finance.—Wages and salaries paid in 1955 totalled \$3,100,000,000. Net debt of the province was \$270,000,000 as of March 31, 1956. The budget in 1956 showed a surplus of \$83,081,000 on ordinary account. Revenues for 1955-56 reached \$389,468,000, and the surplus was sufficient to meet all fixed capital charges, which amounted to \$83,006,000.

Estimated expenditures for 1956-57 included: \$65,251,000 for health, \$65,760,000 for roads, \$57,881,867 for education, \$36,581,500 for youth and social welfare, \$24,325,600 for public works, \$22,058,000 for agriculture, including grants, education and loans; \$13,690 for colonization, \$6,695,000 for lands and forests and \$6,119,000 for government hydroelectric power.

Agriculture.—Field crops produced in 1955 had a total value of \$144,700,000 compared with \$139,100,000 in 1945. Fruits and vegetables totalled \$26,800,000 compared with \$17,000,000 in 1945. Other farm products brought \$11,700,000 against \$6,400,000 in 1945. The total for milk and dairy products reached \$170,000,000 against \$90,500,000 in 1945; livestock \$126,500,000 against \$85,900,000, poultry and eggs \$63,200,000 against \$29,300,000.

Industrial Production.—Mining production was a record \$385,000,000 in 1955, while estimates for 1956 mining production were \$500,000,000 or more. Forest products in 1955 totalled \$292,000,000, hydroelectric power sold from central stations reached \$164,400,000, fish production was \$5,000,000 and fur production was \$2,000,000. The value of all manufactured products in 1955 totalled \$5,950,000,000, exclusive of construction and construction products. The total value of all products was \$8,524,000,000. (W. Wb.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Industrial Provinces of Canada* (1943).

Racing and Races: see AIR RACES AND RECORDS; AUTOMOBILE RACING; HORSE RACING; MOTOR-BOAT RACING; OLYMPIC GAMES; TRACK AND FIELD SPORTS; YACHTING.

Radar: see ELECTRONICS; TELEPHONE.

Radford, Arthur William (1896—), U.S. naval officer. was born at Chicago, Ill., on Feb. 27; graduating from the U.S. Naval academy at Annapolis, Md., in 1916, he was commissioned ensign that year and subsequently advanced through the ranks to full admiral in 1949. An early navy flier, he was trained at Pensacola, Fla., air station in 1920 and was assigned to the naval bureau of aeronautics in Washington, D.C. (1921-23). Later he was assigned to air units of various ships at sea and was commander of the naval air station at Seattle, Wash. (1937-40). During the early part of World War II, Radford was in charge of aviation training at the naval bureau of aeronautics; in Jan. 1943 he was ordered to duty in the Pacific as commander of a task force preparing the way for and supporting U.S. landings on Tarawa, Baker and Makin islands. In Nov. 1944 he became commander of an aircraft carrier division in the Pacific participating in the Iwo Jima and Okinawa campaigns and in air strikes against the Japanese homeland. After the war he was assistant deputy chief of naval air operations in Washington, then commander of an Atlantic task fleet. He became vice-chief of naval operations in Jan. 1948 and the following year was appointed commander in chief of the U.S. Pacific fleet and high commissioner of U.S. trust territories in the Pacific.

On May 12, 1953, Radford was nominated by Pres. Dwight D. Eisenhower to succeed Gen. Omar N. Bradley as chairman of the U.S. joint chiefs of staff—first navy man to hold that post. He was appointed to his second term on May 25, 1955.

In July 1956 Radford was reported to have under consideration a plan to reduce U.S. armed forces personnel from about 2,800,000 to 2,000,000 by 1960.

Radio and Television. Radio stations in operation or under construction throughout the world numbered approximately 8,450 in Oct. 1956. This total represented a gain of about 250 during the preceding 12 months. The figures included amplitude modulation (AM) and frequency modulation (FM) broadcasting stations, plus the boosters or relay stations which are used for broadcasting in some areas. The number of television stations on the air or being built throughout

the world, based on information compiled by *Broadcasting-Telecasting* magazine for its 1956-57 *Telecasting Yearbook*, totalled 750 to 800, a gain of about 50 over the figure for Oct. 1955.

The number of radio receiving sets in use throughout the world was estimated at 230,000,000 to 255,000,000. This reflected a gain of about 5,000,000 during the year. In television, approximately 37,000,000 receivers were in use in the U.S., and to this total *Broadcasting-Telecasting's* compilations added another 10,000,000 sets in use in other parts of the world. The 1956 estimated world total of 47,000,000 television sets may be compared with an estimate of 40,500,000 to 43,500,000 in Oct. 1955.

U.S. Manufacturing.—Production of both radio and television sets in the U.S. in the first eight months of 1956 was running slightly behind the totals for the comparable period of 1955. Radio receiver output totalled 8,216,707 units through Aug. 1956 as against 8,707,477 in the same 1955 period, according to records kept by the Radio-Electronics-Television Manufacturers association. Television set production in the same span came to 4,365,060 as compared with 4,820,991 during the first eight months of 1955.

While set production dropped somewhat behind the 1955 pace during the Jan.-Aug. 1956 period, actual sales of radio receivers increased slightly. The trade association reported that eight-month radio set sales through retail outlets (excluding automobile radio sets) totalled 4,694,454 through Aug. 1956, compared with 3,189,608 in the same period in 1955. In addition, 2,710,303 automobile radios were produced during the first eight months of 1956. Eight-month television sales in 1956 totalled 3,839,718 receivers, as against 4,171,139 in the first eight months of 1955.

During 1955, last full year for which figures were available in Oct. 1956, radio set production in the U.S. reached its highest point since 1948, totalling 14,894,695 receivers as against 10,400,530 in 1954, according to the manufacturers' trade association. Output in 1948 was an all-time high of 16,500,000 radio sets. The 1955 total was broken down as follows: 3,393,882 home radios; 2,027,545 portables; 7,229,594 automobile radios and 2,243,674 clock radios.

Television set production reached an all-time record of 7,756,721 receivers in 1955. This figure may be compared with 7,346,715 in 1954 and 7,463,800, the previous record, in 1950.

Sets in Use.—The Radio Advertising bureau, a trade organization, estimated the total number of radio sets in working order in the U.S. at 124,000,000 in early 1956. Of this total, 82,000,000 were located in homes, 32,000,000 were in automobiles and 10,000,000 were in public places. Including those temporarily not in working order—that is, needing or undergoing repairs—the U.S. total was placed at 142,000,000. In Sept. 1955 there were 121,000,000 radio receivers in working order.

Television sets in working order in the U.S. numbered approximately 37,000,000 in Oct. 1956, according to unofficial estimates. This number represented a gain of about 3,500,000 during the preceding 12 months. Official figures released by the Advertising Research foundation, based on data gathered by the U.S. census bureau and the A. C. Nielsen Co., research organization, showed 35,495,330 U.S. households with television sets as of March 1956 (this study, dealing in households, did not attempt to estimate the total number of sets, but it was known that the number of homes with two or more television receivers was gradually increasing). The number of households with television represented 73% of the 48,784,600 households in the U.S. at the time of the study.

U.S. Stations and Networks.—The number of AM, FM and television (TV) commercial stations authorized or operating in the U.S. in Oct. 1956 totalled 4,230, a gain of 174 in 12 months, according to records compiled by *Broadcasting-Telecasting* from official data of the Federal Communications commission. The

number of these stations actually in operation in Oct. 1956 was 3,923, compared with 3,739 a year earlier. These totals did not include 43 television and a half-dozen FM stations which had been authorized to operate noncommercially in the educational field.

Commercial AM stations numbered 3,064 in Oct. 1956, compared with 2,917 a year earlier. Of these, 2,936 were in operation, an increase of 172 in 12 months. Once again, the number of FM commercial stations dropped, falling from 559 in Oct. 1955 to 546 in Oct. 1956. Of the 546 authorized, 522 were actually on the air, as against 540 in Oct. 1955 and 561 in Oct. 1954.

The number of authorized commercial TV stations stood at 620 in Oct. 1956, a gain of 40 since Oct. 1955. But 20 other authorized TV stations had voluntarily given up their permits during the year, so that the net gain in stations was 20. Of the 620 authorized stations, 465 were on the air as compared with 435 in Oct. 1955. Among the operating stations, 374 were assigned to operate in the established very-high-frequency (VHF) band of the spectrum and 91 were in the newer ultrahigh-frequency (UHF) band.

Aside from the commercial TV stations, 10 new noncommercial educational television authorizations during the year brought the total in this category to 43. A total of 22 of these—17 in VHF, 5 in UHF—were actually on the air in Oct. 1956, as against 16 in Oct. 1955 and 7 in Oct. 1954.

U.S. Networks.—A newcomer to the TV network ranks in 1956 was the NTA Film network, operated by National Telefilm Associates, a TV film distributing organization. It differed from the existing networks in that it delivered its programs to its affiliated stations on film rather than by the cable and radio relay systems which linked the established networks' stations and enabled them to transmit their programs simultaneously, or "live," to their various affiliates across the country. Moreover, whereas the established networks fed programs to their stations extensively both day and night, the NTA Film network supplied its programs for only two hours a week, although it planned to increase this programming eventually. The NTA network commenced operation in mid-Oct. 1956 with slightly more than 100 stations taking its programs.

The established networks remained unchanged. In television there were three which functioned on a nation-wide scope; they were operated by the American Broadcasting company, the Columbia Broadcasting system and the National Broadcasting company. In radio there were four national networks, three of them operated respectively by the three TV network companies and the fourth by the Mutual Broadcasting system.

Legislation.—The broadcasting industry in 1956 was enmeshed in almost one round of investigations after another. The senate commerce committee, the house judiciary committee's antitrust subcommittee and the house small business subcommittee all had investigations going at one time or another during the year. All three were directed primarily against the networks, although few aspects of broadcast operation were left unprobed by one or another of the groups. In addition, the Federal Communications commission had a special staff of its own assigned to investigate network operations.

One of the chief targets of the congressional investigators was network-affiliate contract provisions giving the networks the right to use, for their own programs, certain hours of desirable time in their affiliated stations' schedules. Critics claimed this right gave the networks too much control over important time that belonged to the stations, while the networks argued that they must have this right of access in order to assure their advertisers—their principal sources of revenue—that their programs would be seen by audiences large enough to justify the high cost of sponsorship. Similarly, the networks argued that the practice of requiring advertisers to put their programs on a certain num-



SCENES FROM TWO 1956 TELEVISION PRODUCTIONS based on literary classics: top, Maurice Evans and Lilli Palmer in a scene from Shakespeare's play *The Taming of the Shrew*; bottom, Fredric March and Claire Trevor in *Dodsworth*, an adaptation of the novel by Sinclair Lewis

ber of stations—another major target of the investigations—was also necessary if the networks were to survive economically. These issues were still pending in Oct. 1956.

U.S. Commercial Broadcasting.—Total revenues of the broadcasting industry (AM, FM and TV; networks and stations) passed the \$1,000,000,000 mark for the first time in the calendar year 1954, latest for which official figures were available in Oct. 1956. Reports compiled by the Federal Communications commission from data supplied by networks and stations showed the 1954 total was \$1,042,500,000, a gain of 14.8% over the \$908,000,000 reported in 1953. These figures, which represent reve-

nues from the sale of time, talent and program materials to advertisers, did not, however, include an estimated \$193,000,000 paid by advertisers for talent and program production costs to organizations which did not operate networks or stations. Nor did they include \$133,000,000 in commissions paid to advertising agencies and station sales representatives in connection with the sale of time and programming. Thus, FCC pointed out, when all these factors were counted, total advertising expenditures for radio and television came to an estimated \$1,400,000,000 in 1954.

Of the \$1,042,500,000 received by radio and TV broadcasters, \$910,400,000 was paid out for expenses, leaving \$132,100,000 in broadcast income (before federal income tax) for the year. (See Table I.)

Radio.—Total broadcast revenues of AM and FM stations and networks dipped slightly in 1954 for the first time in 16 years. FCC placed the total at \$449,500,000, or 5.4% less than in the preceding year. Revenues of the four nation-wide and three regional networks and their 21 owned and operated stations dropped 9% to \$88,500,000, continuing a decline in network business that had started several years earlier. The 2,577 independently owned AM and FM stations, whose revenues had increased 2.4% in 1953, dropped to \$361,000,000 for a 4.5% fall in 1954.

The networks kept their expenses to \$80,400,000, or 7.4% less than in 1953, while the other stations trimmed their expenditures 1.9%, to a total of \$327,300,000. Their combined expenses thus came to \$407,700,000, or 3.1% under the figure for 1953. Despite these economies, however, total broadcast income (before federal income tax) for the year dropped 24% to a total of \$41,800,000. Of this amount, the broadcast income of networks and their owned stations was \$8,100,000, off 21.7% from the year before, while that of other AM and FM stations was \$33,700,000, down 24.5% from 1953. (See Table II.)

Radio revenues from time sales—the principal income source for both radio and television—aggregated \$451,330,000 in 1954. This was a drop of 5.4% from the approximately \$477,000,000 recorded in 1953, when time sales ran slightly (0.9%) ahead of the preceding year. Network time sales, which had been falling for several years, continued the downward trend with a 14.7% drop to \$83,684,000 in 1954. Nonnetwork time sales to national and regional advertisers, on the climb in the preceding year, also fell behind in 1954 with a 7.3% decline to \$120,168,000. Making it unanimous in all three sales classifications, time sales to local advertisers dropped 0.8% in recording \$247,478,000 for the year. These time-sales figures did not include data for FM stations, whose share of the combined AM-FM revenues was known to be minor.

Estimated Radio Time Sales for 1955.—*Broadcasting-Television* estimated, on the basis of an annual survey, that radio time sales in 1955 recovered from their 1954 dip and reached a total of \$455,649,000. Although short of the record \$477,000,000 reported in 1953, this was more than \$4,300,000 above the 1954 total. The 1955 time sales to network advertisers were estimated at \$60,570,000; nonnetwork sales to national and regional advertisers at \$117,070,000 and sales to local advertisers at \$278,009,000.

Television.—Although compilation of radio data after 1954 was still incomplete in Oct. 1956, FCC reported that total broadcast revenues of television networks and stations in 1955 rose to \$744,700,000, compared with \$593,000,000 in 1954 and \$432,700,000 in 1953. Broadcast expenses went up from \$364,700,000 to \$502,700,000 to \$594,500,000 in the same three-year span, leaving television broadcast income (before federal income tax) of \$150,200,000 in 1955 as against \$90,300,000 in 1954 and \$68,000,000 in 1953.

Television time sales in 1955 totalled \$681,100,000, a gain of

Table I.—Broadcast Revenues, Expenses and Income of Networks and Stations of AM, FM and Television Broadcast Services

Service	1954 (in 000,000)	1953	Per cent increase or decrease in 1954
Broadcast revenues			
Radio	\$ 449.5	\$475.3	— 5.4
Television	593.0	432.7	37.0
Industry total	\$1,042.5	\$908.0	14.8
Broadcast expenses			
Radio	\$ 407.7	\$420.3	— 3.1
Television	502.7	364.7	37.8
Industry total	\$ 910.4	\$785.0	16.0
Broadcast income (before federal income tax)			
Radio	\$ 41.8	\$ 55.0	—24.0
Television	90.3	68.0	32.8
Industry total	\$ 132.1	\$123.0	7.4

Note: 1954 radio data cover the operations of 4 nation-wide and 3 regional networks, 2,555 AM and AM-FM and 43 independent FM stations. 1953 data are for the same networks and 2,434 AM and AM-FM and 45 independent FM stations. 1954 TV data cover the operations of 4 networks and 410 stations; 1953 data are for the same networks and 334 stations.

Table II.—Broadcast Revenues, Expenses and Income of Radio Broadcast Services

Service	1954 (in 000,000)	1953	Per cent increase or decrease in 1954
Broadcast revenues			
4 nation-wide networks and 3 regional networks (including owned and operated stations)*	\$ 88.5	\$ 97.3	—9.0
Other radio stations†	361.0	378.0	—4.5
Total	\$449.5	\$475.3	—5.4
Broadcast expenses			
4 nation-wide networks and 3 regional networks (including owned and operated stations)*	\$ 80.4	\$ 86.9	—7.4
Other radio stations†	327.3	333.4	—1.9
Total	\$407.7	\$420.3	—3.1
Broadcast income (before federal income tax)			
4 nation-wide networks and 3 regional networks (including owned and operated stations)*	\$ 8.1	\$ 10.4	—21.7
Other radio stations†	33.7	44.6	—24.5
Total	\$ 41.8	\$ 55.0	—24.0

*Includes the operations of 22 network-owned stations in 1953 and 21 in 1954. †Includes 2,457 AM, AM-FM or independent FM stations in 1953 and 2,577 in 1954.

Table III.—Broadcast Revenues, Expenses and Income of 4 Television Networks and 437 Television Stations

Item	1955	1954* (in 000,000)	1953†
Broadcast revenues			
4 networks‡ (including 16 owned and operated stations)	\$374.0	\$306.7	\$231.7
93 prefreeze TV stations	230.0	200.9	174.5
Subtotal	\$604.0	\$507.6	\$406.2
Postfreeze TV stations			
225 VHF stations	\$112.2	\$ 60.0	\$ 16.1
103 UHF stations	28.5	25.4	10.4
Industry total	\$744.7	\$593.0	\$432.7
Broadcast expenses			
4 networks‡ (including 16 owned and operated stations)	\$306.0	\$270.2	\$213.7
93 prefreeze TV stations	148.1	133.3	114.0
Subtotal	\$454.1	\$403.5	\$327.7
Postfreeze TV stations			
225 VHF stations	\$107.4	\$ 63.8	\$ 20.3
103 UHF stations	33.0	35.4	16.7
Industry total	\$594.5	\$502.7	\$364.7
Broadcast income (before federal income tax)			
4 networks‡ (including 16 owned and operated stations)	\$ 68.0	\$ 36.5	\$ 18.0
93 prefreeze TV stations	81.9	67.6	60.5
Subtotal	\$149.9	\$104.1	\$ 78.5
Postfreeze TV stations			
225 VHF stations	\$ 4.8	—\$ 3.8	—\$ 4.2
103 UHF stations	—4.5	— 10.0	— 6.3
Industry total	\$150.2	\$ 90.3	\$ 68.0

*1954 data cover 4 networks (including 16 owned and operated stations); 92 prefreeze and 302 postfreeze stations (177 VHF and 125 UHF). †1953 data cover 4 networks and 16 owned stations; 92 prefreeze and 226 postfreeze stations (114 VHF and 112 UHF). ‡Number of networks was 3 after Sept. 15, 1955, when Du Mont network ceased operations.

\$143,100,000 from 1954 and \$296,408,000 more than in 1953. Network time sales rose to \$308,900,000 from \$241,000,000 in 1954; nonnetwork time sales to regional and national advertisers reached \$222,400,000 as compared with \$177,000,000 the year before, and local sales climbed to \$149,800,000 as against \$120,000,000 in 1954. Sales of talent, program and other "incidental" material to advertisers added \$172,300,000 or \$31,300,000 more than in 1954.

U.S. Programs.—The trend toward big shows, such as the 90-minute "colour spectaculars," continued in 1956, but at a slightly slower pace. NBC-TV, which originated the "spectaculars," ac-

tually cut back somewhat on the number of these elaborate productions for the 1956-57 fall and winter season. But it retained a substantial schedule of "spectacular" and other special productions, including "Wide Wide World" with its live camera pickups from all over the U.S.—and sometimes Cuba, Canada and Mexico—in the course of an hour and a half. CBS-TV scheduled, among other major productions, the first weekly series of 90-minute dramatic programs, called "Playhouse 90." ABC-TV, although it remained the only one of the three established television networks not yet engaged in colourcasting, launched a number of major series covering virtually all fields—music, drama and comedy.

The Democratic and Republican presidential nominating conventions in August and the elections in November were the big "news" for both television and radio in 1956. The networks gave virtually gavel-to-gavel coverage of the conventions—whose planners, aware of the magnitude of the audiences to be gained through TV, had arranged their sessions to accommodate television as completely as possible and thereby get the fullest benefit from the reach of the new medium. Although all radio and television networks had sponsors who paid an estimated total of \$14,500,000 for convention and election coverage, the networks reported afterward that they had lost \$4,000,000 to \$5,000,000 in presenting the conventions to their audiences.

Programming was also affected widely by electioneering. Between the nominating conventions and the elections, both radio and television schedules were increasingly filled with political broadcasts as the parties at all levels—national, state and local—relied upon TV and radio more heavily than ever before to reach the voting public. Often entire programs were pre-empted for political broadcasts. More often—and this was a development that became widespread in 1956—the office seekers sought to capitalize on the popularity of existing programs (and also to save money) by buying five-minute segments instead of the customary 15-minute or half-hour programs. Thus countless popular programs were shortened by five minutes in order to make way for these brief political appearances, usually presented on radio.

Aside from politics, colour telecasting was a growing factor in television programming in 1956. A special study made by *Broadcasting-Telecasting* in mid-Oct. 1956 showed 29 advertisers sponsoring colour TV programs on NBC-TV and eight on CBS-TV on a regular basis and elicited from advertising executives the view that colour TV would become a major factor in television advertising by 1958. Both NBC-TV and CBS-TV, meanwhile, boosted their colour production activity as part of an effort to acquaint their advertisers with the techniques of using colour and to help boost the sale of colour sets, which, according to best available estimates, were expected to reach 500,000 to 1,000,000 during 1957. NBC-TV, increasing its colour programming 500% for the 1956-57 fall-winter season, planned to present 120 to 130 hours of colour in the final quarter of 1956 as against 22.5 hours in the same period of 1955. CBS-TV expected to carry nearly four hours of colour programs each week. ABC-TV still had not entered the colour field.

In the area of local station programming—as distinguished from network programming—a 1956 development that had an almost immediate effect was the release of major motion-picture companies' libraries of pre-1949 films for use on television. Until 1956 television had been limited in the motion-picture field largely to older movies, old westerns and motion pictures produced abroad, notably those made by British producers. But in 1956 most of the major U.S. producers negotiated multimillion-dollar contracts under which they agreed to make available to TV vast libraries of theatrical films made before 1949. For instance, RKO Teleradio Pictures sold 740 RKO feature films and

1,000 short subjects to C & C Super Corporation for \$15,200,000; Warner Brothers sold a library of 850 feature movies and 1,500 short subjects to PRM, an investment firm, for \$21,000,000; Metro-Goldwyn-Mayer started releasing, directly to stations and sometimes with a partial interest in station ownership as part of the lease price, 725 of its pre-1949 films; and 20th Century-Fox Film corporation signed with NTA Film network for the release of a potential 390 features for \$30,000,000, at the same time acquiring a one-half interest in the film network itself.

Radio programming, which underwent far-reaching changes in 1955, remained a subject of experimentation in 1956. CBS radio, which alone among the networks had stuck close to radio's pretelevision practice of presenting standard-length (15-minute, half-hour and full-hour) programs at the same time each week, retained and even solidified that format, adding an hour-long variety show featuring Robert Q. Lewis to its weekday evening schedule and bringing comedian Jack Benny, one of radio's brightest pre-TV stars, back in his old Sunday evening half-hour spot, effective in the fall of 1956. NBC radio, however, which in 1955 had instituted a daytime schedule of special features, interviews, music, news and other miscellaneous material, abandoned this format except on week ends and, in its place, installed a two-hour daily series of live music by name bands, followed by dramatic programs. ABC radio to a great extent continued its pattern of drama, news and music, while Mutual was preparing, in Oct. 1956, to bolster its programming with story material, actors and actresses made available to it by RKO Radio Pictures, a major motion-picture production firm which, like Mutual, was owned by RKO Teleradio Pictures.

Among entertainment programs, top-rated network shows are listed—radio and television separately—in Tables IV-IX as they ranked at two different periods of 1956 (August and January).

Awards.—The 13th annual Alfred I. du Pont awards, in recognition of "meritorious service to the American people," were presented in March 1956 to Howard K. Smith, chief European correspondent for CBS, for his "exceptional insight" into European events and for "his ability to communicate that meaning with clarity, liveliness and warmth"; and to WTIC, Hartford, Conn., and WICC, Bridgeport, Conn., for "meritorious service to the American people" during 1955. The du Pont awards, ad-

Table IV.—Top-Rated Evening Network Radio Programs in the U.S.—
Winter Listening

Program	Rank		Homes reached*
	Jan. 1956	Jan. 1955	
"Our Miss Brooks"†	1	5 & 7	2,200,000
"Edgar Bergen"†	2	...	2,059,000
"Two for the Money"	3	...	2,012,000
"Edgar Bergen"†	4	...	1,872,000
"Dragnet"	4	3	1,872,000
"News" and "Gene Autry"	4	...	1,872,000
"Gret Gildersleeve"	7	...	1,778,000
"You Bet Your Life"	7	8	1,778,000
"Gunsmoke"	9	...	1,732,000
"People Are Funny"†	10	4 & 6	1,685,000

*Homes reached during all or any part of the program, except for homes listening only one to five minutes. †"People Are Funny" and "Our Miss Brooks" in Jan. 1955, and "Edgar Bergen" in Jan. 1956, each had cosponsors or alternate sponsors whose respective segments were measured separately. Each listing above is for a different segment.
Source: A. C. Nielsen Co., Chicago.

Table V.—Top-Rated Weekday Network Radio Programs in the U.S.—
Winter Listening

Program	Rank		Homes reached*
	Jan. 1956	Jan. 1955	
"Wendy Warren"	1	...	2,340,000
"Arthur Godfrey"†	2	...	2,293,000
"Helen Trent"	2	9	2,293,000
"Guiding Light"	4	2	2,246,000
"Young Dr. Malone"	5	4	2,200,000
"Arthur Godfrey"†	5	...	2,200,000
"Arthur Godfrey"†	8	...	2,153,000
"Arthur Godfrey"†	8	...	2,153,000
"Arthur Godfrey"†	8	1	2,153,000
"Ma Perkins"	8	...	2,153,000

*Homes reached during all or any part of the program, except for homes listening only one to five minutes. †"Arthur Godfrey" in Jan. 1956 had cosponsors whose respective segments were measured separately. Each listing above is for a different segment.
Source: A. C. Nielsen Co., Chicago.

Table VI.—Top-Rated Evening Network Radio Programs in the U.S.—
Summer Listening

Program	Rank		Homes reached*
	Aug. 1956	Aug. 1955	
"Best of Groucho"	1	5	1,277,000
"Truth or Consequences"	2	...	1,135,000
"Godfrey's Talent Scouts"†	2	4 & 9	1,135,000
"Hambledonian Stakes"	4	...	993,000
"News from NBC"	4	...	993,000
"Godfrey's Talent Scouts"†	4	4 & 9	993,000
"Gangbusters"	4	...	993,000
"Treasury Agent"	8	10	946,000
"True Detective Mysteries"	9	...	899,000
"All-Star Football Game"	9	...	899,000

*Homes reached during all or any part of the program, except for homes listening only one to five minutes. †"Godfrey's Talent Scouts" in Aug. 1955 and again in Aug. 1956 had more than one sponsor, whose segments were measured separately. Each listing above is for a different segment.

Source: A. C. Nielsen Co., Chicago.

Table VII.—Top-Rated Weekday Network Radio Programs in the U.S.—
Summer Listening

Program	Rank		Homes reached*
	Aug. 1956	Aug. 1955	
"Our Gal Sunday"	1	4	1,797,000
"Second Mrs. Burton"	2	...	1,750,000
"Aunt Jenny"†	3	...	1,703,000
"Road of Life"	3	2	1,703,000
"Young Dr. Malone"	5	10	1,656,000
"Aunt Jenny"†	6	...	1,608,000
"Helen Trent"†	6	5 & 9	1,608,000
"My True Story"	6	...	1,608,000
"House Party"	9	8	1,514,000
"Nora Drake"	10	6	1,466,000

*Homes reached during all or any part of the program, except for homes listening only one to five minutes. †"Aunt Jenny" in Aug. 1956, and "Helen Trent" in Aug. 1955, each had more than one sponsor, whose segments were measured separately. Each listing above is for a different segment.

Source: A. C. Nielsen Co., Chicago.

Table VIII.—Top-Rated Network Television Programs in the U.S.—
Winter Viewing

(For two weeks ended Jan. 21, 1956, and Jan. 22, 1955)

Program	Rank		Homes reached	
	Jan. 1956	Jan. 1955	Jan. 1956	Jan. 1955
"Peter Pan"	1	...	18,077,000	...
"\$64,000 Question"	2	...	17,620,000	...
"Ed Sullivan Show"	3	10	16,918,000	13,692,000
"Disneyland"	4	6	16,041,000	14,890,000
"I Love Lucy"	5	1	15,374,000	16,792,000
"Dragnet"	6	5	14,918,000	14,955,000
"Jack Benny Show"	7	...	13,794,000	...
"You Bet Your Life"	8	4	13,689,000	15,037,000
"Ford Star Jubilee"	9	...	13,443,000	...
"December Bride"	10	...	13,338,000	...

Source: A. C. Nielsen Co., Chicago.

Table IX.—Top-Rated Network Television Programs in the U.S.—
Summer Viewing

(For two weeks ended Sept. 8, 1956, and Sept. 10, 1955)

Program	Rank		Homes reached	
	Sept. 1956	Sept. 1955	Sept. 1956	Sept. 1955
"64,000 Question"	1	1	14,364,000	17,766,000
"Ed Sullivan Show"	2	2	13,120,000	12,360,000
"Lux Theatre"	3	6	11,046,000	9,801,000
"Miss America Beauty Pageant"	4	5	10,745,000	10,246,000
"Gunsmoke"	4	8	10,745,000	9,692,000
"Climax"	4	4	10,745,000	10,292,000
"Robert Montgomery Presents"	7	...	10,254,000	...
"I've Got a Secret"	8	...	10,179,000	...
"Lawrence Welk Show"	9	...	10,104,000	...
"Ford Theatre"	10	...	9,991,000	...

Source: A. C. Nielsen Co., Chicago.

ministered by Washington and Lee university, Lexington, Va., consist of a plaque and \$1,000 for each winner, the money to be used in establishing scholarships or fellowships in the communications field at institutions of the recipient's choice.

The 16th annual George Foster Peabody awards for "the most distinguished and meritorious public service," administered by the Henry W. Grady school of journalism of the University of Georgia, Athens, in conjunction with the Peabody board, were presented in April to Douglas Edwards, CBS newsmen, in the field of television news; comic Jackie Gleason (CBS) and singer Perry Como (NBC) in the area of TV entertainment; "Production Showcase" (NBC) in television dramatic entertainment; the "Lassie" series (CBS) in TV youth and children's programs; Frank Baxter of KNXT (TV), Los Angeles, and CBS in TV education (with citation to the "Omnibus" program, then on CBS, in this field); "Voice of Firestone" series (ABC) in radio-television music; Sylvester L. ("Pat") Weaver, Jr., then NBC board chairman, for pioneering programming concepts, in the field of radio-TV public service; Quincy Howe, ABC newsmen,

for radio-TV promotion of international understanding (with citation to the "Assignment India" program on NBC in this field); "Biographies in Sound" series (NBC), in the field of radio education; KIRO, Seattle, Wash., for local public service by a radio station (citation to KFYO, Lubbock, Tex.); and citations to WMT-TV, Cedar Rapids, Iowa, and KQED-TV, San Francisco-Berkeley, Calif., the latter an educational station, for local public service by TV stations.

(See also ADVERTISING; EDUCATION; FEDERAL COMMUNICATIONS COMMISSION; HUMOUR OF 1956; MEDICINE; MOTION PICTURES.) (S. TF.; R. W. CR.)

Technical Developments.—Miniaturization was a dominating theme of 1956 radio and television technical advancement. Portable size television sets, opening a new market area, brought experimentation by manufacturers to determine the smallest size screen to which viewers would be receptive, indicating a marked reverse of the early trend toward larger screens.

Industry news early in the summer of 1956 centred largely upon the development of miniature television cameras which later were used in television coverage of the national political conventions. The Radio Corporation of America developed a transistorized 4-lb. camera and portable 15-lb. back-pack transmitter which subsequently were used in National Broadcasting company convention coverage. The Columbia Broadcasting system used two cameras—one, developed by Lockheed Aircraft corporation's research laboratory, a one-half pound Vidicon pickup device which was connected by cable to a control room, and the other, a portable INTEC camera-transmitter made by the *French Compagnie Générale de TSF*. The American Broadcasting company-TV used a Philco four-pound Vidicon camera mounted on a gunstock.

Other developments of the year included a midjet power supply unit for TV studio equipment, reducing tube and space requirements by more than 70%, and predictions of imminent availability of smaller, 110° deflection angle picture tubes which might shorten the depth dimension of television sets.

Further advances in miniaturization brought the tiniest transistor to date—so small that 20 can be placed on a dime—and the smallest loud-speaker ever built for commercial radio receivers. A Japanese pocket radio appearing on the U.S. market weighed 290 g., used 5 transistors, 1 diode and a 2½-in. dynamic loud-speaker and operated from a 22.5-v. battery.

Television.—Colour television was introduced in Great Britain in 1956. In the United States there was constant improvement in colour television equipment and programming, including a substantial increase in the number of colour programs on the air, both through the major networks and by local stations.

Broadcasting field tests continued on RCA's magnetic tape colour recording system for station use. Television on magnetic tape was brought closer to the home with the development at RCA laboratories of a home "hear-see" player which can reproduce prerecorded black and white programs from magnetic tape onto standard home TV receivers.

A lenticular film system, fast-action film recording method in which film can be made and developed within three hours, was developed by RCA, NBC and the Eastman Kodak company, and introduced in broadcast service by NBC. With this system, a TV program can be transmitted at the most opportune hour in each time belt rather than simultaneously across the country in the usual manner of network broadcasting.

New equipment for television receivers in 1956 included a new "disk type" tuner for portables, said to be 20% smaller, yet more sensitive, than the conventional turret type. A completely mechanical TV remote-control unit powered by flashlight batteries was introduced. Other developments of 1956 included a commercial "creepy-peepy" camera-transmitter system, a spe-

cial image orthicon camera which "sees" in the dark and a new high-voltage rectifier tube to cut set manufacturing costs.

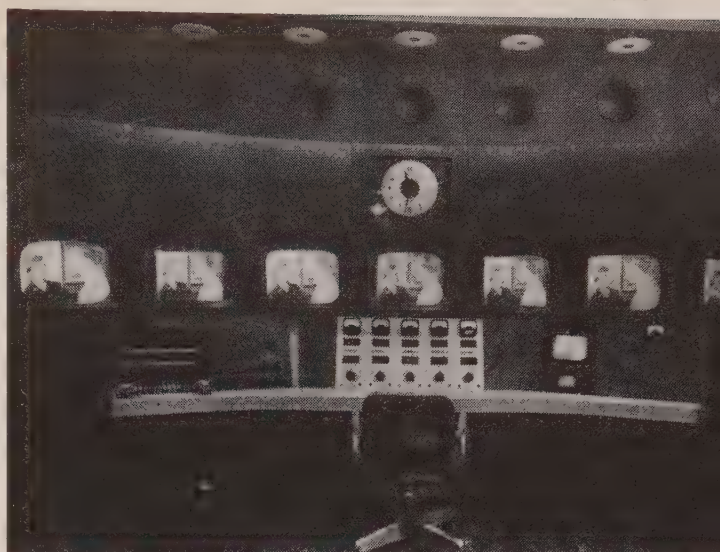
Closed-Circuit Television.—The first public-school closed-circuit TV "network," including 11 schools in Pocatello, Ida., with a local community antenna system and studios at Idaho State college, was opened in February. The Ford foundation, electronics industry and educators sponsored a showcase project of an entire county school system to be hooked up gradually by closed-circuit television in Washington county, Md.

A novel technique of light amplification, with possible future application to television, was an electroluminescent panel developed by RCA. As an amplifier of projected light, the device was capable of increasing visible brightness by 1,000 times. In an experimental application, the panel was combined with industrial X-ray equipment to provide an amplifying fluoroscope capable of achieving a hundredfold increase in the brightness of an X-ray image.

Bell laboratories disclosed that a recognizable TV signal of a telephone caller had been transmitted across the nation over ordinary telephone lines. Still in the developmental stage, the system's Vidicon camera transmitted a new still picture every two seconds, giving a 2-by-3 in. picture with 60-line, 2,400-dot resolution.

The nation's first closed-circuit community TV station went into operation in Cedar City, Utah. Drawing financial support from a subscription cable arrangement and local advertising, the station employed no outside signals, originating all programs locally. Meanwhile, plans were generating in the west for the opening of 50 more such "Comprovision" (community program television) stations within the next 12 months. The year also saw continued experimentation in shopping via closed-circuit TV equipped with special telephone.

New applications of industrial closed-circuit television systems included observation of the performance of aircraft models in a supersonic wind tunnel, watching processing operations inside steel mill reheating furnaces, observing steel plates on a conveyor and following complex freight movements in the Chattanooga, Tenn., railroad yards.



MASTER CONTROL CONSOLE of the Chicago, Ill., studios of the Columbia Broadcasting system opened in 1956. The equipment was capable of accommodating 18 audio and video program sources and switching them to 5 outgoing program circuits and 2 test channels

Radio.—Radio manufacturers continued to explore improvements and applications of their miniaturized products. Transistors were employed in two-way radios and in a novel solar-powered radio receiver placed on the market by Admiral corporation. Pocket-sized transistor radios also were used for the first time in exploring trouble sources in electrical equipment.

RCA announced development of a new two-way radio which cut frequency band width requirements by one-half. Employing the already known single-side band technology, the new equipment applied it for the first time without the earlier hindrances of increased cost and complexity.

Military Radio and Television.—An aircraft instrument panel simplification program, tied to the United States air force's interest in the "flat" picture tube, had as one of its goals the replacement of instrument panel meters by one or two picture tubes. Undertaking a similar simplification program, the navy announced plans to fly a Lockheed T2V jet trainer with the new instrumentation by the end of the year. The army signal corps unveiled a new portable TV camera-transmitter as a tactical military device. An air-borne TV system which can give clear pictures from planes flying at supersonic speeds in stratosphere was designed by Philco corporation for the Aerial Reconnaissance laboratory at Wright Air Development centre, Dayton, O.

Also designated for air force application was the "cat eye," an electronic light intensifier capable of viewing objects in the dark to produce sharp and clear television pictures. Developed under air force contract by RCA with co-operative research at Wright Air Development centre, the "cat eye" operates on principles similar to those of television, sensing and amplifying the ever-present photons unseen by the human eye. The air force indicated interest in this type of device as a highly effective means of reconnaissance.

Possible military intelligence application was foreseen for two TV cameras designed in England for underwater diving use. One, a small hand-held device, can be dropped to a depth of 250 ft. and operated by a control unit above the water as the diver positions it. A larger version, charted for use at depths as great as 3,000 ft., can be suspended by a cable from a moving ship, propelled by an electronically operated cradle or held by the diver since, like the smaller camera, it is weightless in water. The United States navy ordered a U.S. version of the smaller camera for marine research and deep-sea salvage, and the United States fish and wildlife service was conducting experiments with



PORTABLE PICKUP, a 4-lb. television camera and 15-lb. transmitter unit developed by the Radio Corporation of America and tested at the 1956 national political conventions. A feature of the equipment was an electronic view finder permitting the cameraman to observe the scene being picked up by the camera (as shown in the photograph)

similar equipment off the Florida coast.

Other military developments of the year included the army's disclosure of a wide-spaced image orthicon light intensifier and the navy's plans to locate in Maine the world's most powerful radio communication station radiating two megawatts. Also noteworthy was the revelation that FPIS (forward propagation by ionospheric scatter), permitting reception of directional signals over distances between about 500 and 1,500 mi., had solved problems of erratic radio signals in the arctic. (C. B. J.)

Radio Amateur Stations.—Early in 1956, it became apparent that the sunspot cycle was emerging from the ebb of its 11-yr. period. The resultant increase in long-distance communications possibilities was enthusiastically greeted by the 150,000 amateurs licensed by the Federal Communications commission. A wide-spread interest in contacting foreign stations was reawakened when Russian amateurs again began exchanging reports and other information with "hams" in democratic countries. Previously confined to satellite countries, these contacts, though brief, were a welcome addition to the variety of world-wide contacts.

As a morale stimulus and public service, the U.S. navy established amateur stations for the convenience of the wintering-over parties at Little America and other Antarctic bases. These stations were pressed into service to provide contacts with home through the courtesy of amateur relay stations which, in many instances, permitted the men to talk directly with their families.

Robert W. Gunderson (W2JIO), himself blind, was awarded the 1955 Edison Radio Amateur award in recognition of his outstanding contributions in helping blind persons achieve security through employment in the electronics field.

Hundreds of amateurs in California and Oregon, aided by others from nearby areas, hastily set up emergency communications in midwinter of 1955-56 when floods devastated and paralyzed normal facilities. The annual June field day test sent approximately 10,000 operators into remote locations to set up communications under simulated emergency conditions. With power supplied by auxiliary generators, many stations were active for the entire 24-hr. period.

The American Radio Relay league, national nonprofit association of amateur operators, co-operating with the U.S. air force, undertook a program designed to gather radio propagation information supplied by amateurs during the International Geophysical Year, 1957-58. Observations of variations of radio conditions and other phenomena would be correlated and analyzed by a special league staff. Indicative of the assistance that amateurs could perform, clubs and groups were encouraged to set up special receiving installations to help track, by radio, the man-made satellites which would be launched during this period.

(L. Ak.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Development of Communications* (From Telegraph to TV), 2nd ed. (1955); *Story of Communications* (1955).

Radiology: see X-RAY AND RADIOLOGY.

Railroad Accidents: see DISASTERS.

Railroads. Railroads of the United States had a trying year in 1956. Despite efforts toward greater efficiency and economy of operation, the net earnings of railroads fell below those of 1955, though they were appreciably better than in 1954. A strike in the steel industry, which caused suspension for about five weeks in this important source of railway traffic, was an added handicap.

From operations in 1956 the railroads¹ derived total revenues of \$10,600,000,000, about \$500,000,000 in excess of 1955 and

\$1,200,000,000 more than in 1954. However, operating expense increased more than revenues, as the result of higher wage and material costs. The result was a decline in the net amount left from revenues after paying operating expenses, taxes and interest charges on borrowed money (but before dividends), to \$875,000,000 in 1956, compared with \$927,000,000 in 1955 and \$682,000,000 in 1954.

Notwithstanding effects of the steel strike, 38,000,000 cars of freight were loaded on railroads in 1956, compared with 37,900,000 in 1955 and 33,900,000 in 1954. Freight volume amounted to 1,500,000,000 tons, hauled for an average of 433 mi., making a total transportation performance of 650,000,000,000 ton-mi. (1 ton hauled 1 mi.). The average revenue received from this service was 1.4 cents per ton-mile. Passengers travelled a total of 28,500,000,000 passenger-mi. (1 person moved 1 mi.), with an average journey per passenger of 65 mi., at an average revenue to the railroads of 2.63 cents per mile.

Railroad mileage continued in 1956 to decline, reflecting the modern trend toward more intensive utilization of less trackage. At the end of the year there were 211,000 mi. of first main track and 139,700 mi. of second and other main tracks, yard tracks and sidings, for a total of 350,700 mi. of all tracks. Rolling stock included 1,800,000 freight cars of railroad ownership and 191,000 privately owned cars, plus 21,000 caboose cars and 85,000 cars used by railroads for their own work. Passenger train cars included 4,700 cars of the Pullman company (itself owned by the railroads) plus 31,700 cars owned by railroads directly. Of these latter, 17,100 were passenger-carrying cars and 14,600 units were for mail, baggage and express. Motive power comprised 30,500 locomotives, consisting of 26,200 diesel-electric, 3,700 steam and 600 electric and other types. During 1956 the railroads installed in service 1,400 new diesel-electric locomotives and 10 all-electric locomotives, 55,000 freight cars and 400 passenger train cars (including some self-propelled units).

Approximately 1,044,000 persons were employed on the railroads in 1956, with a total payroll of \$5,300,000,000, averaging \$5,100 per employee. This average compared with \$2,700 in 1945, which marked the end of World War II. Increased wage demands from large groups of employees in 1955 were embodied in new wage agreements effective Oct. 1 and Dec. 1, 1955, and March 1, 1956, at a total annual cost to the railroads of \$413,000,000. In addition, 73 classes of nonoperating employees sought and received a wage settlement granting an increase of 12.5 cents per hour, effective Nov. 1, 1956, with additional increases of 7 cents per hour effective Nov. 1, 1957 and Nov. 1, 1958, plus a semiannual cost-of-living adjustment. The settlement was for a three-year period. The 12.5 cents increase (if applied to all other employees) meant an annual increase of \$316,000,000 in the railroad payroll, and the 7 cents per hour increases in 1957 and 1958, if similarly applied, would raise this to \$670,000,000 annually.

As in other industries, the upward spiral in wages brought imperative need for increased revenues to meet the cost. In March 1956 the Interstate Commerce commission authorized a general increase of 5½% in freight rates. In April the commission authorized increases of 5% in passenger fares and 7½% in Pullman accommodations. However, returns from these increases proved inadequate to meet higher wage and material costs. Railroads in the east and west in September filed a petition with the Interstate Commerce commission asking for a general investigation of the level of freight rates and a further general increase of 15% in freight rates, subject to specified exceptions and maxima. On Nov. 6, 1956, following the nonoperating employee wage settlement, the eastern and western railroads filed a motion for a 7% emergency freight rate increase. The southern roads later joined in a similar request. The Interstate Commerce com-

¹Railroads herein are those of class I, with revenues exceeding \$3,000,000 annually. These account for approximately 95% of total railway figures.

mission on Dec. 17 authorized increases of 7% in the east and 5% in the west, effective Dec. 28.

Passenger service also was the subject of further important moves. In recent years this service had shown deficits for the railroads as a whole ranging between \$650,000,000 and \$700,000,000 annually, according to methods of cost allocation prescribed by the Interstate Commerce commission. The commission in March scheduled an investigation into all phases of this deficit, including its own rules for cost allocation. Meanwhile, several large eastern railroads took drastic action in August by petitioning the commission for an increase of 45% in first-class railroad fares. They were granted on Dec. 31 an interim increase of 5%, with western railroads receiving the same increase. The same railroads, joined by others in the east and west (but not the south), also sought authorization for an increase of 5% in coach fares, which was granted on Dec. 31. At the same time, a nationwide increase of 7% in charges for Pullman accommodations was authorized. Several railroads were offering large numbers of passenger station properties for sale or lease. One of the railroads (the Pennsylvania), meanwhile, was spending \$2,000,000 to modernize its New York station ticket office, including use of television to speed up ticket sales.

A great disappointment to the railroads was failure of the congress to take any effective action in 1956 toward carrying out recommendations of the Presidential Advisory Committee on Transport Policy and Organization. This committee, appointed by the president in 1954, with the secretary of commerce as chairman and composed of cabinet officers and senior government officers, recommended 11 basic changes in transportation legislation and regulation. Hearings on bills to carry these recommendations into effect were held in 1956 in the house of representatives, but no further legislative action was taken.

Continuing a marked trend in recent years, 1956 witnessed additional changes in ownership and control of important railway properties. A new management was installed on the Chicago and North Western railway by interests which earlier had been in control of the Minneapolis & St. Louis railway. New ownership gained a majority of seats on the board of directors of the Monon (which in January became the formal name, instead of the nickname, of the Chicago, Indianapolis and Louisville railway). The Union Pacific railroad took steps to acquire by exchange of stock the ownership of the 180-mi. Spokane International.

Merger possibilities announced as being under study during the year included unification of the Great Northern, the Northern Pacific, the Spokane, Portland and Seattle and the Chicago, Burlington & Quincy (including its subsidiaries, the Colorado and Southern and the Fort Worth and Denver). This would be the largest merger in many years, involving 27,000 mi. of railroad in 19 states and 2 Canadian provinces. Studies were also continuing on possible consolidation of the Chicago, Milwaukee, St. Paul and Pacific and the Chicago and North Western, although the new management of the latter road indicated a disposition to defer decision while carrying out improvement policies. Another merger possibility under study concerned the Erie, the Delaware, Lackawanna and Western and the Delaware and Hudson railroads. Considerable progress already had been made in joint terminal operations of the two latter roads in New Jersey.

Of great potential importance was the proposal for a 1958 census of transportation recommended to the secretary of commerce by his transportation staff. The census would include the distribution of freight and passenger transportation by each type of land, air and water carrier, and much other valuable information. The estimated cost of \$1,200,000 would have to be provided by congressional appropriation. The congress authorized a similar census in 1948 but failed to appropriate money for it.



"XPLORER," a lightweight, low-slung train introduced to service on the New York Central railroad in June 1956. The train carried 392 coach passengers and was capable of a speed of 120 m.p.h.

An important milestone was the announcement by the Great Northern railway in August of the end of approximately half a century of electrified operation of 73 mi. of railroad across the Cascade mountains, including the 7.79-mi. Cascade tunnel. Aided by a new tunnel ventilation system, diesel-electric locomotives took over this mileage. A similar event was replacement by diesel-electric operation of the former electrified operation between St. Louis, Mo., and Peoria, Ill., by the Illinois-Missouri Terminal railway (formerly the Illinois Terminal Railroad company, recently sold to a group of large railroads).

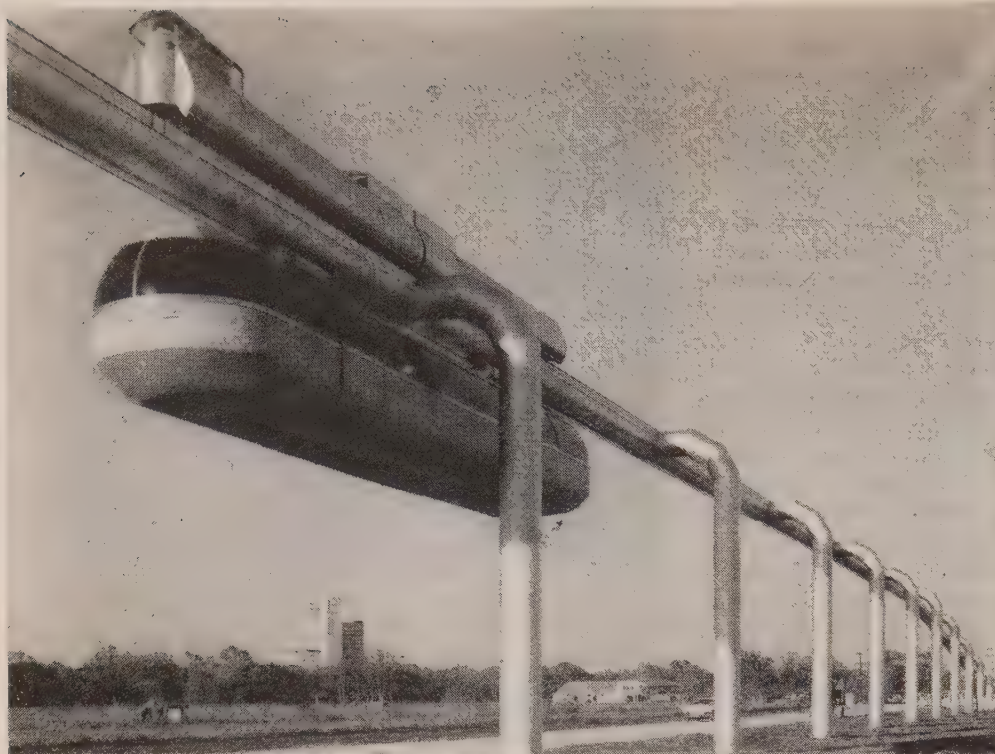
Progress continued at a rapid rate during the year on technical advancement in the railway industry. Notable was the inauguration in regular service of a Talgo-type train on the Chicago, Rock Island and Pacific railroad and of a new lightweight train of tubular design on the Pennsylvania railroad. Two lightweight Aerotrains, owned by the builder, were operated experimentally in regular service on various roads. Several other types of lightweight trains were scheduled for early delivery and operation, principally in the east. The Santa Fe placed in operation a new train made up entirely of high-level cars.

After several years of pioneer operation of oil-burning gas-turbine locomotives in heavy freight service, the Union Pacific railroad ordered 15 new and larger units to supplement the existing 25, and announced intention to buy 30 more such locomotives. A coal-burning gas-turbine locomotive, under design for several years by a group of railroads and coal interests, was to be constructed in 1957. Work on design of an atomic-powered locomotive was under way, either gas or steam propulsion being considered theoretically feasible; however, grave problems of biological shielding and other safety measures remained to be solved.

Yards and terminals continued to receive major attention. Radar and electronics were combined to provide automatic braking of cars moving into classification tracks, with television and photography teamed for automatic identification of cars entering yards. High-speed electronic machines convert punched cards into telegraphic records, and vice versa, for automatically and speedily receiving, assembling and forwarding reports on car movements.

Railroads in 1956 spent more than \$1,300,000,000 for these and other improvements to get more capacity, efficiency and economy from their plant and facilities.

(See also INTERSTATE COMMERCE COMMISSION.) (L. J. K.)



MONORAIL TEST TRAIN operating at Houston, Tex., in 1956

Other Countries.—The year 1956 was notable for the decision by three of the world's most important railway administrations to turn over to diesel or straight electric traction. These countries were the U.S.S.R., the German Federal Republic and Great Britain; they followed the example set more than 20 years before by the United States.

The causes for this change were the poor quality and high price of coal, the difficulty of obtaining labour to maintain steam locomotives and the fact that the diesel yielded greater availability in any given period, as did the straight electric.

A major event in Europe was the adoption of a two-class system for passengers from June 1956.

Canada.—In Canada dieselization continued. On the Canadian National the Newfoundland district had been entirely dieselized. The famous International Limited had been turned over to diesel traction, and orders for new diesel units in 1956 exceeded \$30,000,000. Double-deck automobile cars had been placed in service, as well as boxcars with aluminum roofs; in passenger service "dinette"-type refreshment cars proved popular.

Canadian Pacific developments included rapidly extending use of diesel traction, embracing the very successful Dayliner type of rail car, admirably suited to Canadian conditions; 29 such units operated in all provinces served by the Canadian Pacific. The Manitowadge branch in Ontario was opened late in 1955 to assist mining developments. The Pacific Great Eastern railway's southerly extension to north Vancouver was opened in 1956.

Great Britain and Ireland.—The £1,200,000,000 modernization plan of British railways gained impetus in 1956 with diesel rail car units coming into operation in many areas. Meantime the fleet of diesel shunters in service had passed the 500 mark, and 400 more had been ordered, in addition to 1,750 vehicles for diesel multiple-unit sets. Tests were made with a Deltic 3,300-h.p. single-unit diesel electric of English Electric design.

Financial results of British railways for 1955 were disappointing, receipts not greatly exceeding expenses, this being mainly because of the 1955 strike of locomotive men which cost the railways £12,000,000. Early in 1956 the British government announced its intention of meeting capital requirements of national-

ized industries.

In Northern Ireland, Ulster Transport railways incurred heavy deficits; the Great Northern closed its Banbridge line and in view of severe financial losses was examining major closure schemes. In the Irish republic, *Córas Iompair Éireann* (the Irish railway system) concentrated on the turnover to diesel traction, both locomotives and rail cars, thereby offering major accelerations in comparison with 1939.

Continental Europe.—French National railways concentrated on electrification of heavy traffic lines in eastern France, leading to Strasbourg and Basle, together with routes into Switzerland via Vallorbe and Pontarlier; there were destined to be three different systems of electric traction between Paris and Berne. About 3,200 route-mi. in France were

electrified. The 1955 financial deficit was very heavy.

West German railway developments included major resignalling at Frankfurt, the reconstruction of the Rhine bridge at Mainz, the growing use of long welded rails and the rapid extension of rail buses and electric-battery cars on branch lines. Many yard locomotives had been fitted with ultra-short-wave radio sets. East German railways reinstalled electric traction, dismantled in 1945-46. Belgian National railways continued conversion to electric traction, notably on the routes via Arlon and Virton to Luxembourg, where links would be made with French and German systems. Netherlands railways completed reconstruction of the Moerdijk bridge near Dordrecht, the longest railway bridge in the country. To provide greater flexibility and additional accommodation, locomotive-hauled trains superseded some multiple-unit ones.

Swiss Federal railways completed doubling the Lausanne-Berne artery, and progress was made with the doubling of the Zürich-Chur line in Glarus, also the Olten-Biel section, carrying 100 trains daily. Swiss railways remained among the most profitable in Europe. Italian State railways, by electrifying to Palermo, provided an all-electric 1,466-mi. route with through cars from Paris except for the train ferry at Messina. Expenses considerably exceeded revenues in Italy, mainly because of the heavy cost of war damage reconstruction.

Spanish National railway progress was outstanding; notable events were electrification from León to Busdongo, doubling of the Miranda-Alsasua international route, new railway construction from Burgos toward Madrid and additional sections opened on the important new Zamora-Orense-LaCoruña line. Hungarian railways constructed a new station at Szolnok, and dual-gauge sleeping-car services were increased between Moscow and Vienna, Prague and Belgrade.

In Norway the last and westernmost section of the Sorland line, Oslo-Stavanger, was converted to electric traction, and the Nordland line toward Bodo opened to Saltdal. Danish railways received additional diesel locomotives and installed a new design of passenger car. Sweden celebrated its railway centenary. In Finland diesel expresses were inaugurated between Turku and Helsinki. Russian railways accelerated main passenger services, but

they were still below 1939 speeds, freight taking preference. In European Turkey new B-B type electric locomotives operated on the Sirkeci-Soguksu section of the state railways, electrified on the 50-cycle A.C. system.

Asia.—Soviet railways provided a service over the trans-Siberian route of 5,800 mi. from Moscow to Vladivostok in 8 days 6 hours, and a through service existed from Moscow to Peking via Harbin and Mukden, in spite of change of gauge. The Tsining-Erhlien 215-mi. section of the Ulan-Bator line was opened, using the Russian five-foot gauge, in 1956; break of gauge occurred at Tsining, where the bogies under through sleeping cars were changed. Railway construction continued westward from Lanchow; 900 mi. in all were to be built in 1956. Australian-built diesels were operating on the Kowloon-Canton line.

Indian railways had adopted corridor stock and air conditioning for the third class and were reducing the number of classes. The Eastern railway was divided to form a new southeastern system; thus there existed seven large Indian railways. Pakistan extended diesel traction, as did Ceylon and Malaya, while Turkey had 800 mi. of new line under construction and Saudi Arabia was extending its railway from Riyadh toward Mecca and Medina. Japanese National railways completed electrification from Nagoya to Kyoto, about 1,300 route-mi. out of 12,400 now having been electrified.

Africa.—South African railways continued large-scale programs to cope with ever-increasing traffic; doubling progressed between Durban and Ladysmith and also between Pretoria and Bloemfontein; electrification proceeded on many sections, including that from Witbank to Kroonstad. Orders were placed for 200 diesel locomotives, a new development for South Africa. Rhodesian developments included extensive improvements at Bulawayo and further installations of centralized traffic control. New construction included the Bancroft line, but much more important was the inauguration in July of through working from Bulawayo to Lourenço Marques in Mozambique.

East African railways opened the 208-mi. Western Uganda extension from Kampala to Kasese in August. The Bas-Congo-Katanga railway celebrated its 50th anniversary and the Upper-Congo-Lakes railway was regauged from 1 m. to 3 ft. 6 in.; in August these railways were linked by the opening of the Kamina-Kabalo section, thus forming an important trans-African link of uniform gauge. Gold Coast railways inaugurated a new line from Achiasi to Kotoku on the Accra-Kumasi route.

South America.—Large-scale improvement of the Brazilian railways had been undertaken thanks to a loan from the Export-Import Bank of Washington to finance new equipment. Financial deficits of many operating companies continued grievous. The Central Brazil railway received new electric and diesel units as well as 2,000 steel freight cars. Argentina was steadily replacing steam traction by diesel units, some imported from Hungary and the Netherlands; Japanese-built coaches entered service on the Sarmiento railway. Financial results and physical equipment were described in a ministry report as being in a parlous condition, with urgent need for rehabilitation. New oil-fired 2-8-0 steam power was delivered to the Peruvian corporation for its three-foot gauge Trujillo section with very heavy grades. New mileage was being completed in Ecuador from Quito to San Lorenzo, near the Colombian frontier (232 mi.).

In Colombia the 70-mi. Dorada railway had been sold to the government, and in Chile the Taltal railway was sold to local Santiago interests.

Australasia.—Victorian railways inaugurated main-line electrification of the Gippsland section to Traralgon, 97½ mi. from Melbourne, in March 1956, marking a major phase in the £80,000,000 modernization scheme known as Operation "Phoenix." The major level-crossing elimination program continued, and new

Daylight accelerated express service between the state capitals of Sydney and Melbourne also commenced in March. New South Wales railways suffered from disastrous floods, causing serious financial losses.

Western Australian railways installed a centralized traffic control system near Perth and received 24 new 2-8-2 British-built steam locomotives (3 ft. 6 in. gauge). (C. E. R. S.)

ENCYCLOPEDIA BRITANNICA FILMS.—*Development of Transportation* (1931).

Rainfall: see METEOROLOGY.

Raisins: see FRUIT.

Rapid Transit: see URBAN TRANSPORTATION, U.S.

Rates of Exchange: see EXCHANGE CONTROL AND EXCHANGE RATES.

Rayon and Other Synthetic Fibres: see TEXTILE INDUSTRY.

Reclamation: see FORESTS; IRRIGATION; SOIL CONSERVATION.

Red Cross. **United States.**—The year 1956 was the 75th anniversary of the American Red Cross. From its founding in 1881, the American Red Cross had served in approximately 6,000 disasters and expended more than \$230,000,000 contributed by the people of the U.S. to aid those in distress.

In 1955, when heavy hurricane rains caused great destruction in six eastern states, tens of thousands of volunteer workers began to help, guided and aided by 850 disaster workers from all over the nation. Since the cost of assistance from the Red Cross needed by individuals, families and small businesses could not be met by funds on hand, a special disaster appeal for \$10,000,000 was made, which was oversubscribed in two weeks with a great outpouring of aid not only from within the country but from other countries—from governments, Red Cross societies and citizens. The contributions reached \$16,000,000 and the cost was \$18,000,000. Fifteen thousand families were helped to become again self-supporting.

At Christmas 1955, thousands of families were driven from their homes by violent floods in the far west. Expenditures totalled more than \$8,000,000. During 1955, Red Cross assistance was also given in nearly 300 other disasters, and the more than \$30,000,000 spent in assisting disaster victims made the year the costliest in Red Cross history.

Assistance to men and women in active military service, the veterans of several wars and their families cost more than 40% of the organization's annual budget. Each month during the year, home service in local chapters served 109,000 servicemen and their dependents and 38,000 veterans and their dependents. Each month, 12,200 members of the armed forces in 224 military hospitals in the U.S. and overseas were served by paid staff and 17,000 volunteers. On military installations in the U.S. and abroad, paid staff and 6,600 volunteers served 90,000 members of the armed forces monthly. Five clubmobile units in Korea and five community centres in the European area provided recreational activities for 112,400 military personnel each month.

Red Cross staff members serving in 70 Veterans administration offices each month assisted 14,000 families of veterans and surviving dependents with their applications for government benefits. In 176 Veterans administration hospitals 17,000 volunteers gave a total of nearly 2,000,000 hours serving patients.

The Red Cross blood program, collecting annually 2,000,000 bottles of blood through its 49 regional programs, was the largest single co-ordinated blood-collecting program in the world. A total of 3,900 hospitals throughout the nation were provided with blood during 1955.

From July 1955 through June 1956, 852,100 certificates were issued in first aid, 1,348,300 in water safety and 216,800 in

home nursing. About 2,500,000 additional persons were reached through group instruction meetings on health and safety, and first-aid facilities were provided for 8,200 public events. A network of 19,000 emergency highway first-aid stations, mobile units and detachments was in operation. Approximately 24,000 volunteers took special training for their work in chapters, hospitals, institutions and other agencies; 48,500 nurses were enrolled for work in disaster and in other Red Cross and community programs; and trained volunteers served in 6,850 hospitals, including 150 civilian mental hospitals, and nearly 3,000 agencies and organizations. A total of more than 500,000 volunteers were actively engaged each month in Red Cross work as leaders, instructors, fund campaign solicitors and in the ten service programs.

The American Red Cross assisted 16 other countries following disasters. Red Cross and government officials from 39 countries had an opportunity to visit with the American Red Cross and study methods and sources.

Students enrolled in the Junior Red Cross in 74,000 elementary and secondary schools aided child disaster victims in other countries. They also filled more than 400,000 gift boxes for shipment to children of other lands, made and filled 350 school chests (including educational, health and recreational supplies) and exchanged art work, correspondence and music albums as part of their program of building good will. (C. L. B.)

International.—Of the approximately \$35,000,000 expended by or through the Red Cross during 1956 for assistance to victims of calamities caused by nature and for aid to refugees, international relief amounted to \$8,000,000. Of this \$3,500,000 represented agricultural products donated by the United States government through the League of Red Cross societies for flood sufferers in Hungary. The balance, gifts from national Red Cross societies, went to victims of floods in India, Pakistan, Yugoslavia, Lebanon, Turkey, Korea, Iran, Burma and the United States; earthquakes in Afghanistan and Greece; an explosion in Colombia; to Arab refugees in the near east; refugees in Germany and sufferers from the exceptional winter cold in Italy and France.

During May 1956, the International Committee of the Red Cross held a meeting in Geneva, Switz., of jurists, military experts and specialists on civil defense of 13 national Red Cross societies to draft a code of rules reaffirming the principle of re-

spect due civilian populations in the event of armed conflict. This proposed code was to be submitted to the 19th International Red Cross conference, which would include delegates from all Red Cross and Red Crescent societies and all governments signatory to the Geneva conventions; it was scheduled to meet in New Delhi, India, Jan. 21–Feb. 5, 1957.

In July 1956, the International Red Cross announced that through its good offices 100,000 persons had been reunited with their families since the end of World War II. Because of relaxed controls, these reunions were being speeded up.

During the year the League of Red Cross societies enrolled its 75th member, the Red Cross society of the Democratic People's Republic of Korea. In process of formation were Red Cross or Red Crescent societies in Vietnam, Laos, Cambodia, Sudan, Libya, Liberia, Tunisia and Morocco.

Junior Red Cross training centres, attended by more than 300 members and leaders from 30 countries, were held in Great Britain, the Netherlands, Italy and the United States. Technical assistance missions in Junior Red Cross organization were sent by the League of Red Cross societies to Lebanon, Thailand, Burma, Vietnam, Laos, Cambodia, the Philippines, Australia and New Zealand. (See also REFUGEES.) (H. W. DG.)

Reforestation: see FORESTS.

Reformed Church: see PRESBYTERIAN CHURCH.

Refugees. The influx of Hungarian refugees into Austria in Nov. and Dec. 1956, consequent upon the political upheaval and military repressions in Hungary which began on Oct. 23, constituted one of the largest refugee movements in Europe since World War II. By Dec. 9, 1956, more than 130,000 refugees had entered Austria. The flow was continuing at the rate of approximately 2,500 a day. While some effort on the part of the Hungarian and Soviet military to prevent the refugees from leaving Hungary was apparent, the controls at the border were obviously ineffective and at times appeared to be either half-hearted or poorly organized.

Austria was ill-prepared to receive, house and feed such large numbers suddenly seeking asylum with little more than the clothes on their backs. Already the host for approximately 30,000 refugees from eastern European countries and 150,000 Volksdeutsche who had arrived at the end of the war and had not acquired Austrian citizenship, Austria had earlier in the year granted asylum to increasing numbers of refugees from Yugo-

ROSETTE OF CANOES formed during a canoeing class at an aquatic school at Brevard, N.C., operated in 1956 by the American Red Cross



slavia. The flow of refugees from Yugoslavia in earlier years had been in manageable proportions. From the spring of 1956 to December the numbers increased from 400 to 1,000 monthly. Another 1,000 refugees from Yugoslavia were entering Italy monthly by way of Trieste in the fall of the year. All available camp facilities in both countries were overcrowded before the flight of Hungarian refugees into Austria began in November.

On Nov. 5, 1956, Austria appealed to the governments of the western world for assistance through the Office of the United Nations High Commissioner for Refugees and the Intergovernmental Committee for European Migration. These governmental bodies, the United States Escapee program and the voluntary agencies had previously been assisting to secure the emigration of refugees from Austria and to integrate those who could not qualify for emigration in the Austrian economy. Appeals were immediately sent to the governments of western Europe and of overseas immigration countries to receive the refugees either permanently or in temporary asylum. Former army barracks and other installations, hastily opened to house the refugees, were soon overcrowded and more than one-third of the refugees had to be placed in small hotels and private homes. The response of the governments and of the people in the various countries was spontaneous and generous, although never quite adequate to meet the needs of the numbers involved.

The offers of secondary asylum, made by individual European governments in terms of a few thousands initially, were soon raised to tens of thousands and totalled more than 80,000 by early December. Some neighbouring governments sent trains and buses into Austria to collect the refugees as they came over the border. Food, clothing and medicines were contributed along with cots, mess kits, soap and sanitary supplies. The International Committee of the Red Cross and the League of Red Cross societies shared the task of receiving and distributing the supplies furnished; the International Committee of the Red Cross assumed responsibility for distribution inside Hungary and the League of Red Cross societies for distribution to the refugees in Austria.

The Intergovernmental Committee for European Migration assisted by the United States Escapee program and the voluntary agencies registered the refugees on arrival, assembled them for departure to other countries and organized trains and air flights. By the first week in December the number of refugees leaving Austria daily about matched the influx. More than 50,000 had been moved to other countries: 3,000 to Belgium, 2,000 to Canada, 1,000 to Denmark, 6,500 to France, 7,600 to Germany, 2,000 to the Netherlands, 2,700 to Italy, 3,000 to Sweden, 9,300 to Switzerland, 9,600 to the United Kingdom and 3,000 to the United States.

As the capacities for absorbing refugees in the European asylum countries were nearing exhaustion, the movement of refugees overseas began in early December. The United States offered to receive 21,500, Australia 5,000 and Canada planned to accept approximately 6,500 by Dec. 31, 1956, although no quota of admissions was established.

The Latin-American countries also offered to receive approximately 10,000. Helpful as those offers were, more than 70,000 refugees remained in Austria in mid-December as a heavy burden on the Austrian economy.

During the year the governments of Spain and of the Union of South Africa joined the Intergovernmental Committee for European Migration, thus raising its membership to 27 governments. The organization was engaged in moving migrants and refugees out of the overcrowded countries of Europe who would not otherwise be moved. The committee moved more than 135,000 migrants and refugees out of Europe during the year to overseas countries. Apart from the unusual movement of refugees



REFUGEES FROM NORTH VIETNAM being carried by native boat along a canal near Cai-San, South Vietnam. On the banks may be seen new straw-thatched houses built, largely with U.S. funds, as part of a refugee resettlement project in 1956

from Austria, Italy proved to be the largest country of emigration and Australia the country which received the largest number of migrants, more than 40% of the total moved under the auspices of the migration committee.

The Office of the High Commissioner for Refugees, organized in 1950 by the United Nations, has the responsibility for providing legal protection for refugees and for seeking permanent solutions of refugee problems by assisting governments and voluntary agencies to facilitate the voluntary repatriation of refugees or their assimilation in countries of asylum. During 1956 the office continued to administer the United Nations Refugee fund established by actions of the assembly in 1953 and applied more than \$2,500,000 contributed by governments in 1956 to projects aimed at the establishment of refugees in agriculture and in small trades, businesses and professions. Housing projects were initiated in Austria, Germany and Greece and vocational training was supplied. Refugee students were assisted to complete their studies.

The United States Escapee program, initiated in 1952, was concerned primarily with the more recent arrivals among the refugees from the eastern European countries and Yugoslavia. The numbers of such refugees increased substantially during the year. They were provided with food, clothing and medical care in supplement to the basic care provided by the countries of asylum. Emphasis was placed on securing the emigration of the refugees to overseas countries of resettlement in order to relieve the countries of first asylum of the burden of continuing care for the refugees. About 24,500 refugees remained under assistance by the escapee program on Oct. 31 and more than 33,500 had been resettled overseas by that date.

German refugees from the east zone of Germany continued to enter west Berlin at the rate of 2,000 weekly during the year. After examination and the grant of refugee status they were flown to western Germany. The high level of economic activity in the German Federal Republic greatly facilitated their absorption in the German communities, although the problem of housing persisted. In spite of increased building programs more than 300,000 remained in camps in west Germany.

Toward the end of the year there were reports of the departure under pressure from Egypt of British and French nationals and of Jews whose nationality status appeared to be uncertain. The large majority were reported to be stateless. No dependable figures of the numbers involved became available, although estimates of 50,000 to 100,000 were made. This development was an aftermath of the Suez canal crisis. Practically all the persons affected had been permanently resident in Egypt.

(See also IMMIGRATION, EMIGRATION AND NATURALIZATION;

UNITED NATIONS.)

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Relay Racing: see TRACK AND FIELD SPORTS.

Relief: see COMMUNITY CHEST—UNITED FUND; RED CROSS; SOCIAL SECURITY. See also the articles on the various states of the United States and the provinces of Canada.

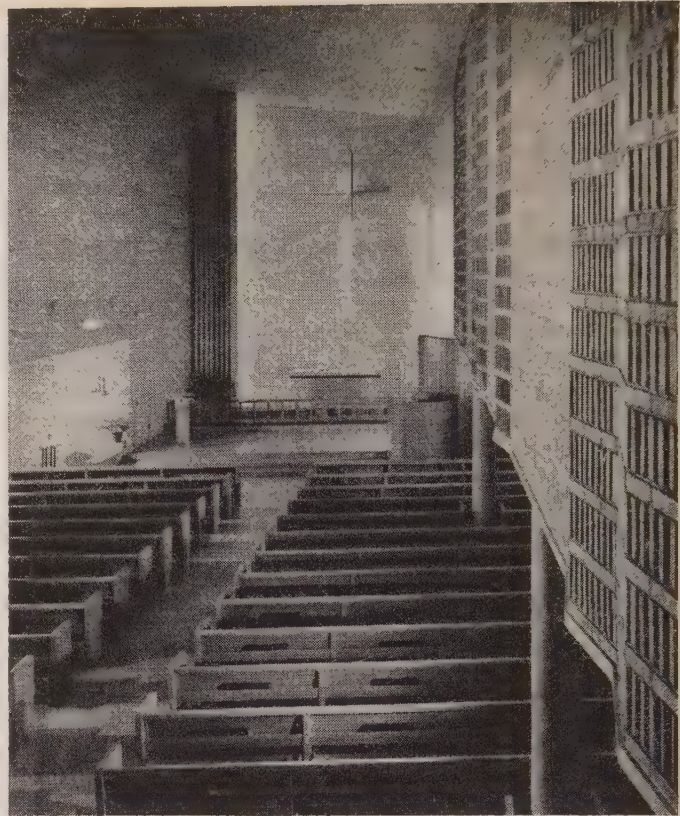
Religion. An outstanding event of the year 1956 was the culmination of the sixth Buddhist world council, which began in May 1954. The crowning episode was the celebration, in May 1956, of the 2,500th anniversary of the Buddha's attainment of nirvana. The council continued with plans for the revision of the texts of the sacred Buddhist books. Its centre was a man-made cave, seating 500 monks and 10,000 others on the outskirts of Rangoon, Burma, modelled after the cave in Bihar, India, where the first Buddhist council was said to have convened 2,499 years earlier. The plans, promotion and program were in the hands of the clergy of the Hinayana branch of the faith with the cordial support of the Burmese government, in Burma, Ceylon, Thailand, Cambodia and Laos, but there were as well friendly visitors from China and Japan. The (Communist) People's Republic of China went to special pains to express its sympathetic interest. The program consisted chiefly of the recitation by monks from memory of the entire and voluminous body of Buddhist scriptures. Part of the revival of Buddhism was seen in sending missionaries, some to the nearby hill tribes of Burma and others to as distant a country as Germany. Buddhist monks were active in the elections in Ceylon and were responsible for one of the policies of the new government which came into power in 1956, to curb what Buddhists deemed the special privileges to Christians long granted by the British regime.

A Hindu revival continued in India, but was promoted only by a vigorous minority. Officially the government of India was neutral religiously and was frankly secular.

The resurgence of Islam mounted, particularly in Indonesia, where it took political aspects, and it marked a phase of mounting Arab nationalism in the middle east. Pakistan was officially declared to be a Moslem state, in view of the overwhelming majority of Moslems in its population.

The Eastern Christian churches presented a varied picture. In Egypt the Coptic Church displayed an awakening, a movement which had been in progress for several years; and the sister church in Ethiopia continued the revival which had marked its course since the end of the Italian occupation and the re-establishment of the native dynasty. Repercussions of the destruction of Greek Orthodox churches in Istanbul by Turkish rioters in Sept. 1955 continued. The agitation for *enosis*, or union with Greece, which rendered Cyprus a centre of turmoil, had a leader in Makarios, the archbishop of the Orthodox Church of Cyprus. Since in the middle east nationality and religion tended to coalesce, the Greek majority in Cyprus and its aspirations were closely identified with the Orthodox Church, and spokesmen for that church in Greece were emphatic in their censure of British measures in Cyprus. Makarios, as the head of the Greek community, was so pronounced in his insistence on *enosis* that the British rulers exiled him to the island of Seychelles in the Indian ocean.

Communist regimes took an ambivalent attitude toward religion, especially toward Christianity. On the one hand, the Polish government intensified its efforts to bring the Catholic Church to heel and to encourage what it adjudged to be the "progressive" elements in the clergy. In China the People's Republic stepped



CITED FOR ARCHITECTURAL EXCELLENCE, the Christ Evangelical Lutheran church, Minneapolis, Minn., was first choice among 18 in the U.S. named by the National Council of Churches in 1956. It was designed by Eliel Saarinen and built in 1949

up its measures to constrain the Catholics to break with Rome and form an independent church, and persecuted some of the clergy who declined to conform. On the other hand, the U.S.S.R. permitted the building of Orthodox churches, facilitated the visits of western churchmen to the Soviet Union, allowed Russian Christians to pay return visits to the churches of the west and gave consent to the Armenians to elect a head of their communion. Especially notable were deputations to the U.S.S.R. from U.S. Protestants, visits of Anglicans from England, a deputation of Russian Baptists to the Baptists of the United States and a delegation representing the major Russian confessions to the National Council of the Churches of Christ in the U.S.A. The People's Republic of China not only took a friendly attitude toward the sixth Buddhist world council but also permitted a small number of Protestant churchmen to attend meetings of their fellow Christians in western Europe in the summer of 1956.

The Hungarian government gave every facility to the meeting of the central committee of the World Council of Churches near Budapest, and the Czechoslovak government permitted the World Alliance of the Reformed Churches to convene in Prague. The Hungarian government cleared the Lutheran Bishop Lajos Ordass of the charges under which he was imprisoned in 1948.

A revival continued in the influence of the Catholic Church in parts of western Europe. In Argentina the Catholic Church was beginning to recover from the blows dealt it by Juan Perón, and in Brazil it was registering gains among the intelligentsia and was active in rural aid and reconstruction in drought-stricken districts and among migrants from the affected areas. In his Christmas message of 1955, Pope Pius XII made a plea for peace in which he urged nations to agree not to employ atomic or nuclear weapons in mass destruction or to explode them in tests or as threats.

The "Tell Scotland Mission," a Protestant effort to win the

unchurched, was making progress. It had been projected for two years or more and enrolled laity as well as clergy in an effort to reach individuals one by one or in families, without spectacular meetings.

The *Kirchentag*, an assembly of German Protestants, met in Frankfurt and attracted tens of thousands, not only from west Germany, but also from east Germany; there were also non-German visitors.

The United States witnessed steps toward church union. Decisive measures were taken by the Evangelical and Reformed Church and the General Council of the Congregational and Christian Churches to bring to consummation the long-negotiated merger of the two bodies into the United Church of Christ. It seemed likely that the union of the Presbyterian Church in the U.S.A. and the United Presbyterian Church would be effected; however, the (southern) Presbyterian Church in the U.S. had so far held aloof. Actions were also taken which seemed to make certain the union of the American Lutheran church and the Evangelical Lutheran Church, with the probability that the United Evangelical Lutheran Church would accede.

In the United States the Eastern Orthodox Church continued its growth, erected new buildings, advanced in its training of clergy and obtained formal recognition from several state legislatures as a distinct branch of Christianity.

Membership in religious bodies in the United States and attendance at religious services were still on the upward curve which had characterized them for a number of years. Voluntary giving to religious enterprises reached new heights, and there was increased construction of churches and organization of new congregations, especially in the suburbs of rapidly growing cities.

(See also CHRISTIAN UNITY; CHURCH MEMBERSHIP; MISSIONS, FOREIGN [RELIGIOUS]; also under separate denominations.) (K. S. L.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Major Religions of the World* (Development and Rituals) (1954).

Religious Denominations: see CHURCH MEMBERSHIP.

Religious Education. Protestant and Orthodox.—The spirit of self-determination which accompanied the process by which colonies with at least one quarter of the world's population became self-governing nations after World War II hastened the development of indigenous Christian education programs in the lands of the so-called "younger" churches. During 1955 and 1956, in addition to the development of indigenous Sunday school curriculum materials which had already taken place in Japan, the Philippines and Latin America, a similar process was taking place in several parts of Asia and Africa.

In India, 11 of the major Protestant and Orthodox churches sent official delegates to an All India Curriculum conference in Nov. 1955 at Jabalpur, and again in Nov. 1956, to share in the co-operative planning of curriculum materials for the churches of India. The delegates decided that two kinds of curriculum materials were necessary, one for the larger Sunday schools and one for the villages. The lesson outlines were put into the hands of writers, and it was hoped that the first books would be published by the end of 1957.

In Africa, following four general conferences on Christian education, to which 17 national Christian bodies in Africa sent delegates early in 1956, it was agreed by 13 of the countries involved south of the Sahara to work together in planning an indigenous Sunday school curriculum for Africa. The planning conference for this curriculum was held Aug. 7-31, 1956, in the Belgian Congo.

In the near east, following preliminary conferences in Cairo,

Egy., and Beirut, Lebanon, in the autumn of 1955, the Protestant and Orthodox churches in that area made plans to develop indigenous Sunday school curriculum materials. Alice L. Goddard, director of children's work for the National Council of the Churches of Christ in the U.S.A., was invited to spend several months in the near east, starting Nov. 1, 1956, to make a survey of the Christian education program of the churches in that area and to serve as a consultant at the Near East Curriculum conference which was to be held near Alexandria, Egy., early in 1957.

More than 50 key leaders in the field of Christian education in Europe met June 9-13, 1956, at Amsterdam, Neth., at a study conference sponsored by the World Council of Christian Education. A conference of German-speaking workers was held near Munich, Ger., in Feb. 1956, and a similar conference for workers from the Latin countries of Europe was planned for early in 1957.

Ten countries in Latin America sent delegates to the 3rd assembly of the Latin American Youth organizations, which was held in Colombia in Dec. 1956. A Pan American consultation was held in the same city immediately following the conference. Under the auspices of the youth departments of the World Council of Churches and the World Council of Christian Education, a team of youth leaders, representing five continents, was to travel through several countries in Latin America to hold institutes for youth workers in the early part of 1957. (N. CL.)

Roman Catholic.—In 1956 the full-time teaching staffs of all Roman Catholic educational institutions in the United States increased by 4,142 members or 3.1% to a record total of 135,406, comprising 8,995 priests, 4,168 brothers, 906 scholastics, 93,518 sisters and 27,819 lay teachers. There were 2,912 more lay teachers, an increase of 11.7% over 1955.

The 12,710 separate Roman Catholic educational institutions included 98 diocesan seminaries, 407 religious community seminaries or novitiates and scholasticates, 254 colleges and universities, 1,546 diocesan and parish high schools, 837 private high schools, 9,051 parish elementary schools and 517 private elementary schools. There were also 143 protective institutions caring for 15,275 youths.

New educational institutions included 20 diocesan and 22 religious community seminaries.

Enrolments in 1956 in the 254 Catholic colleges and universities totalled 241,709, an increase of 10% or 22,003 over the preceding year.

The number of full-time pupils in Catholic elementary and high schools increased by 227,977 during the year. The 1,546 parish and diocesan high schools reported 413,780 pupils, an increase of 15,588 over 1955. The 837 private high schools with 258,519 pupils reported an increase of 17,104 over the 1955 total. Pupils in 9,051 parish elementary schools numbered 3,451,785 or 198,177 more than a year before, while students in the 517 private elementary schools totalled 92,183.

The further progress of religious instruction to children under released time was evident in the 1956 reports of 2,295,902 public-school children attending 46,084 special religious classes or schools, representing respectively a year's increase of 191,272 pupils and 5,941 classes.

Approximately 11,000 delegates and visitors attended the sessions of the 53rd annual convention of the National Catholic Educational association which took place in St. Louis, Mo., April 3-6, 1956. (J. LaF.)

Jewish.—The Jewish world focused its attention during 1956 upon Russian Jewry which was contacted directly for the first time since the Bolshevik Revolution. Following the new Soviet policy of encouraging visitors from other countries, the American rabbinate was invited by the chief rabbi of Moscow to visit

Jewish communities in the U.S.S.R.

The reports of two rabbinic delegations as well as other visitors agreed that Jewish religious life in the Soviet Union was at its lowest ebb and was in danger of fading out altogether. After 40 years of neglect of religious education, there were hardly any young people equipped to practise Judaism even if they were so inclined.

The same reports indicated that while all religious denominations had suffered since the Revolution, the Jewish community fared the worst. In addition to the prohibition of teaching religion to children, the Stalinist era was marked, in its later stages, by outright hostility to Jewry and to Hebrew culture. Indeed, following World War II, the Stalin regime pursued a policy of anti-Semitism which led to the banishment and elimination of outstanding Jewish writers and scholars, some of them faithful Communists.

After the 20th Communist party congress and the denunciation of Joseph Stalin, there were signs of changes for the better. A number of Jewish writers and intellectuals, both living and dead, were rehabilitated and the tight "iron curtain" over Jewish life was lifted. Promises also were made to renew some Jewish cultural activities, including the publication of prayer books and the opening of a rabbinical seminary.

The year also witnessed considerable stirrings and developments in religious education in Jewish communities of Europe, North Africa and Latin America, through the co-operation of the department of education and culture of the Jewish agency and the Joint Distribution committee.

In the United States, a number of studies were conducted by national and local organizations to find ways and means for improving the curriculum of Jewish schools which had made progress in recent years in enrolment but not in content and achievement. Jewish educational circles were also grappling with the problem of teacher shortages. The American Association for Jewish Education convened a national conference in the fall to consider the problem, which had become critical in some communities.

(S. M. B.)

Representatives, House of: see ELECTIONS, U.S.; UNITED STATES CONGRESS.

Republican Party: see POLITICAL PARTIES, U.S.

Research Libraries, Association of: see SOCIETIES AND ASSOCIATIONS, U.S.

Resins: see PLASTICS.

Respiratory Diseases.

Influenza.—No major or widespread outbreaks of influenza occurred during the winter season of 1955–56. However, some reports of 1955 epidemics appeared during 1956. P. J. Wormald and coworkers reported the results of tests of the blood of 504 patients with X-ray evidence of pneumonia during 1954 and 1955 in Cambridge, in Luton and in Dunstable, Eng. Diagnostic rises in titre of antibodies for influenza B were found in 7%, and for influenza A in 2% of these patients. In another study by B. E. Andrews and others, similar tests were done on bloods collected from 1,001 volunteers in ten royal air force stations in England during Dec. 1954 and again from 711 of the same volunteers in March 1955. Evidence of influenza B infection was found in 19%.

Sir Macfarlane Burnet, Melbourne, Austr., considers the influenza virus particle to be a loosely organized unit in which there is a surface membrane that is derived largely from the host cell but which owes its specific qualities to a regular reinforcement with virus protein. This membrane encloses a variable number of genetic determinants which, he feels, must be ribose nucleic acid-protein structures, and a proportion of adventitious material from host cytoplasm. This indeterminate

structure he considers to be consistent with the known properties of the influenza virus, in contrast with those of the poliomyelitis or tobacco mosaic viruses which have organized aggregates of genetic determinants of standard size.

A study of active immunization with influenza A and B viruses in 614 infants and children was reported by M. M. Glazier and coworkers. They observed systemic reactions from one or more injections of the vaccines in 22.8% of the children; these were severe in 9.2%. The reactions were not related to allergy, sex or body type, but they were more frequent and more severe in the young, even when the same dose per kilogram of body weight was given. Also, the reactions varied with the size of the dose at all ages. The antibody response was the same in those who did and in those who did not have reactions. Even the smallest dose produced a good antibody response. They concluded that primary vaccination is fairly effective with a single injection of 0.1 c.c. given into the skin or 0.2 c.c. given under the skin. The antibody response was greater and more rapid when two doses were given a week apart. A booster dose, either of 0.1 c.c. or 1.0 c.c., given three to seven months later, resulted in a similar favourable rise in antibody titre. The elevated titres in the vaccinated children persisted for 12 to 18 months. No tests were done, however, to determine whether the antibodies engendered were active against recent strains.

"Adenovirus Group" and Upper Respiratory Infections.—

Most of the specific types of adenoidal, pharyngeal, conjunctival and respiratory infection viruses were definitely shown to be implicated in certain types of infections, including the acute undifferentiated respiratory infections, ARD, of military recruits; certain nonbacterial types of exudative pharyngitis and tonsillitis; certain types of nonbacterial conjunctivitis and other illnesses in which conjunctivitis is part of a respiratory or more generalized infection. Herpangina, a form of sore throat commonly found in young children, and pleurodynia, or "devil's gripe," had already been identified as caused by various Coxsackie viruses.

These viruses have the following known characteristics: (1) They produce acute infection of respiratory and ocular mucous membranes with associated involvement of the regional lymph glands. Virus has frequently been isolated from adenoid or tonsillar tissues from persons without clinical signs of acute illness. (2) The viruses multiply readily in tissue cultures of certain types of human and simian cells with the production of increased acid and with the production of distinctive changes in the structure and appearance of the cells. As shown by electron micrographs, the nuclei of virus-infected cells may contain symmetrical arrays of viruslike particles. (3) All viruses of this group share a common antigen which can be demonstrated by a specific serological (complement-fixation) test. (4) The individual types are demonstrated by neutralizing the cell-degenerating (cytopathic) effect of the viruses by means of type-specific antiserums in tissue cultures. (5) No strain of this group had, as yet, produced manifest illness in any of the commonly used laboratory animals.

The same type of adenovirus was also identified as the cause of an epidemic of keratoconjunctivitis (formerly known as shipyard conjunctivitis) that had previously been reported in Ontario, Can., in 1951 and was again seen in the area of Toronto in the winter of 1954–55. Strains of this virus were isolated from seven of the patients during the latter outbreak; this was done in tissue cultures of HeLa cells or of monkey-kidney cells. H. L. Ormsby and coworkers also were able to reproduce the disease in a human volunteer after the virus had been passaged four times in tissue culture. Convalescent serums from four patients with epidemic keratoconjunctivitis taken during the 1951 epidemic in Windsor, Ont., had antibodies for another type of

adenovirus that had been isolated by E. Jawetz and his coworkers in California in 1955 from a seaman with a similar disease that had come from the orient. The latter workers presented evidence indicating that one of the viruses which they isolated was associated with typical cases of epidemic keratoconjunctivitis during 1951-55 in several localities in North America. This strain was distinct from types 1 to 7 and was subsequently classified as type 8. However, the same workers also were able to isolate type 6 adenoviruses from two patients with conjunctivitis, associated with mild systemic and respiratory symptoms. They also described five cases illustrating infections with viruses of types 2, 3, 6, 7 and 8. These illnesses ranged from simple conjunctivitis, involving only one eye and without fever or respiratory symptoms, to a severe influenzalike systemic disease necessitating prolonged hospitalization. They emphasized the role of the eye as a probable portal of entry of adenovirus infections. Types 3 and 4 adenoviruses, obtained from tissue cultures, were inoculated by the conjunctival and pharyngeal routes in human volunteers by T. G. Ward of the Johns Hopkins school of hygiene and R. J. Huebner and coworkers of the National Institutes of Health. These volunteers were first shown to have little or no antibodies in their blood. An illness, indistinguishable from pharyngoconjunctival fever, was produced in these volunteers.

Workers in these institutions prepared formaldehyde-inactivated and heat-inactivated type 3 adenovirus vaccines and were able to induce the production of antibodies for this virus by inoculating the vaccines in adult human volunteers. After challenge with live type 3 adenovirus swabbed on the conjunctivas, the volunteers with the vaccine-induced antibodies experienced much greater protection against infection and illness than did vaccinated or unvaccinated persons who did not have demonstrable antibodies. This vaccine-induced protection was nearly equal to that of unvaccinated volunteers with naturally acquired antibodies.

A formaldehyde-inactivated adenovirus vaccine containing types 3, 4 and 7 was commercially prepared and was administered intramuscularly in a single dose of 2 c.c. to nearly 4,000 naval recruits. This produced no untoward local or general reactions. The vaccine induced a substantial antibody response in the blood to each of the 3 types of virus contained in the vaccine. All evidence indicated that the vaccine induced a substantial reduction in the rate of occurrence of acute febrile respiratory illness associated with type 4 adenovirus—the disease commonly encountered in new recruits and known as ARD. The workers from the navy, National Institutes of Health and The University of Chicago who conducted this immunization study felt that the usual interference with military training routine resulting from acute febrile respiratory illnesses may be substantially reduced by adenovirus vaccines.

Virus Pneumonias.—Few cases of primary atypical pneumonia had been shown to be caused by any of the groups of viruses already discussed. A few had been associated with adenovirus, but none of these were cases in which there was a rise in the serum titre of "cold haemagglutinins" or of agglutinins shown to be specific for the MG strain of *Streptococcus*, which are properties of characteristic cases of so-called viral pneumonia of a special type that was prominent during World War II and had been frequently identified since then.

An unusual complication of primary atypical pneumonia is involvement of the central nervous system. An acute encephalitis-like syndrome was reported in one patient by L. Yesnick. A review of the literature indicated 19 cases of such involvement, most of them during World War II but none since 1951. It probably occurs in less than 0.1% of cases and is probably due to the same (as yet unknown) virus that causes the pneumonia.

Psittacosis.—This disease continued to be an important problem since the lifting of the law on importation and interstate transport of parakeets and similar birds. R. H. Seibert and his coworkers in Cleveland, O., reported the finding of serological evidence of psittacosis infection in 17 of 24 Railway Express messengers intimately exposed to parakeets. They also found serological evidence of infection in 4 of 29 family associates of the Railway Express workers who had elevated titres, these 4 having no known contacts with birds. When the blood of patients admitted to hospitals with illness resembling psittacosis or primary atypical pneumonia was studied for evidence of psittacosis infection, 46% of 26 patients with a previous contact with birds had elevated titres as compared with only 4% of 52 patients with no previous history of such exposures.

Pneumonia in Chicken Pox.—In a review of 453 cases of chicken pox, L. Weinstein reported pneumonia occurring in 43, or 9.5%; 20 of these were in children under 7 years old and 21 were in patients over the age of 19 years. In adults with chicken pox, pulmonary disease due to bacteria was not encountered; in them all instances of respiratory infection was of viral origin; conversely, primary chicken pox pneumonia occurred only in adults and was usually associated with severe infection. There were 4 deaths in this group of 43 patients.

In another study, however, 12 cases of severe and fatal generalized chicken pox of the kind that is usually associated with viral involvement of the lungs were collected by R. J. Haggerty and R. C. Eley from among children in a number of hospitals. All of these children acquired their chicken pox in the hospital while they were under treatment with cortisone or similar hormones for various other conditions.

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(M. Fd.)

Réunion. This French overseas island *département* in the Indian ocean has an area of 969 sq.mi. Pop.: (1946 census) 241,708; (1954 census) 274,370 (French creoles, Negroes, mulattoes, Indians and Chinese). Language: French and creole French. Religion: mainly Roman Catholic. Capital, St. Denis, pop. (1954 census) 41,863. Prefect in 1956, Perreau Pradier.

History.—In the elections to the French national assembly held on Jan. 2, 1956, two Communists and a number of the Union Démocratique et Socialiste de la Résistance retained their seats.

Work was begun on the new coastal road from St. Denis to the port. (HU. DE.)

Foreign Trade.—(1955) Monetary unit: 1 franc C. F. A. (Colonies Françaises d'Afrique)=2 metropolitan francs. U.S. \$1=350 metropolitan French francs. Imports 7,000,000,000 fr. C. F. A., including 4,600,000,000 fr. C. F. A. from France, 1,000,000,000 fr. C. F. A. from Madagascar. Exports 5,800,000,000 fr. C. F. A., including 4,400,000,000 fr. C. F. A. to France, 1,000,000,000 fr. C. F. A. to Morocco. Principal exports: sugar 5,000,000,000 fr. C. F. A.

Rheumatic Diseases. **Bacterial Infections of Joints.**—Bacterial diseases of joints had been partially, though incompletely, conquered during recent years through discoveries of potent new anti-infectious agents such as the sulfa drugs, penicillin, para-aminosalicylic acid and isonicotinic acid derivatives. New reports appearing during 1956 emphasized that a great variety of these bacterial infections remain to be conquered, and illustrated the great number of sources from which these instances of arthritis may have an origin—rat infection, spores of the fungus *Coccidioides immitis*, a yeastlike organism known as *Histoplasma capsulatum* resulting in histoplasmosis of joints, and blastomycosis of joints.

Other bacterial infections which attracted attention during the year included actinomycosis, infections of joints with an organism producing blueish coloured pus, namely the *Bacillus pyocyaneus*, and infections with the organism of leprosy.

Rheumatic Fever.—As a cause of death, rheumatic fever ranked second to tuberculosis, among persons under the age of 40, in spite of the declining incidence of acute attacks.

Among the possible causes of rheumatic fever, a strong hereditary taint had been suspected for many years. Studies of this aspect of the disease were pursued diligently and during 1956 new reports showed the occurrence in offspring of rheumatic fever sufferers to follow the pattern of inheritance controlled by a recessive Mendelian gene. Virus studies and the continuing search for a living organism failed to show anything of importance. More and more, research as to the cause of rheumatic fever turned to investigations of a possible chemical disorder.

Most intensely studied during 1956 were the new cortisone derivatives, prednisone and prednisolone. In general, patients responded well to these agents, side effects were slight and disturbances of water metabolism, previously troublesome with cortisone, hydrocortisone and ACTH, were relatively unimportant. Although the number of patients treated was relatively small and the period of observation brief, results of these preliminary tests indicated a notable forward step had been made with prednisone and prednisolone.

In the field of preventing recurrences special attention was devoted during the year to studies with a long-acting preparation of penicillin known as benzathine-penicillin. This substance was administered once every 28 days. Among 50 children treated by this method, not a single recurrence of rheumatic fever was observed and it was concluded from these tests that results in regard to prevention of recurrences were even better with this method than with drugs previously in favour, namely, sulfa drugs and orally administered penicillin.

Rheumatoid Arthritis.—In 1956 there were approximately 700,000 persons in the United States affected by this disease. The

peak incidence occurs among younger persons between the ages of 20 and 30 but the disease is being found increasingly among older persons as well. The cause remained unknown, and information was not available as to the method of transmission from person to person, or the manner of spread from one area to another.

Studies disclosed that rheumatoid arthritis is a significant cause for poor vision and even complete blindness in some individuals. Severe inflammatory changes were found in practically every portion of the eye among a series of cases under investigation. One observation reported among patients with rheumatoid arthritis was anaemia, responsible to a considerable degree for weakness, fatigue and general poor health among these patients. Newly discovered techniques directed toward discovering a cause for this anaemia showed that blood cells of rheumatoid arthritis patients were short-lived and tended to disappear so rapidly that blood-forming organs were unable to maintain adequate replacements.

An increased urinary excretion of certain amino acids was detected in patients with rheumatoid arthritis. This suggested a basic defect concerned with metabolism of proteins. Persons thus affected might possess abnormal connective tissues, perhaps more readily damaged by a specific causative factor of rheumatoid arthritis. Further studies pursued the possible role of adrenal and pituitary glands as causative agents, and still others sought the explanation through studies of chemical constituents of the spleen. A possible role for the subconscious nervous mechanism of the body, the so-called sympathetic nervous system, in causing rheumatoid arthritis was under study. Drugs which alter the function of the nervous system were tested searching for aid in overcoming this disease. Neither the inciting agent nor the mechanism of development for rheumatoid arthritis was discovered through these studies.

A remarkable form of rheumatoid arthritis affecting children attracted special attention during 1956. This condition accounted for approximately 4% of all rheumatoid patients although the age of greatest incidence was found to be the third year of life. Girls were affected twice as often as boys and the disease appeared with special frequency among children with arthritic parents. In some instances a high fever, swelling of the lymph nodes, severe anaemia, enlargement of the spleen and wasting of muscles accompanied the painful swelling of joints. Growth of the body was frequently disturbed. Some patients showed short stubby fingers, receding jaws, shortened, unequal and deformed extremities and even dwarfism. Although the outcome was poor among untreated patients, with the aid of cortisone derivatives notable improvement was the rule. The cause was not determined but the ailment appeared to be identical to rheumatoid arthritis in adults.

Osteoarthritis.—The cause of osteoarthritis continued to remain unknown. Progress of this disease appeared to be related not only to wear and tear but also to unknown metabolic factors which distinguish one individual from another as regards reaction to stress. Genetic studies were being pursued vigorously and appeared to provide at least a partial explanation for occurrence of osteoarthritis. At least one variety appeared in accordance with a definite inheritance pattern which is dominant in women and recessive in men.

Gout and Gouty Arthritis.—For the treatment of patients affected by this extraordinary disease, many new remedies were under investigation. Colchicine, a substance known for more than 2,000 years, was still considered an effective agent. Probenicid and phenylbutazone were found effective in bringing about an increased excretion of uric acid and lowering of the level of uric acid in the blood.

(See also HEART AND CIRCULATORY DISEASES.) (E. F. RG.)

Rhode Island. A north Atlantic state of the United States, in New England, Rhode Island was one of the 13 original states; it is popularly known as "Little Rhody." Area: 1,214 sq.mi. (smallest of the United States), including 157 sq.mi. of water, 67% woodland. Pop.: (1950 census) 791,896; (July 1, 1956, provisional est.) 828,000. The population of the principal cities (1950 census) was: Providence (cap.) 248,674; Pawtucket 81,436; Woonsocket 50,211; Cranston 55,060; Warwick 43,028; Newport 37,564; Central Falls 23,550.

History.—The most important measures enacted at the 1956 session of the state legislature were as follows: four major appropriation acts including \$62,748,372.09 for the conduct of the general government during the fiscal period ending June 30, 1957, \$565,000 for construction in support of changes in the penal system, \$541,000 as partial reimbursement to private general hospitals for facilities made available to the public, and \$2,003,130.07 to offset an anticipated deficiency for the fiscal period ending June 30, 1956; an act continuing for another year the temporary tax increases initially imposed in 1951; an act establishing the state minimum wage standard at 90 cents per hour; an act creating a board of tax equalization for the expressed purpose of providing an equitable basis for distributing state aid to education; an act reorganizing the state's penal system and placing its administrative objectives primarily upon rehabilitation; two acts strengthening the tax laws applicable to motor vehicles, the first denying registration of the vehicle until the sales or use tax has been paid, and the second equally denying registration if the owner has not paid prior year local taxes on a vehicle; an act permitting local governments to acquire slum, blighted and substandard areas, by eminent domain if necessary, for the purpose of redevelopment through clearance, rehabilitation and improvement thereof; an act granting local governments full authority to acquire property as an integral part of carrying out flood control projects; a series of bond proposals totalling \$5,350,000 requiring electorate approval, including \$1,750,000 for additional facilities at the state school for the severely retarded, \$1,500,000 for development of the state's largest airport, and an additional \$1,650,000 for the relocation of the state college of education—these proposals were in addition to the referenda for \$15,000,000 enacted in 1955 for approval at the 1956 general elections: following the now common annual pattern, a series of acts authorized the local governments to issue bonds for school construction purposes totalling \$12,759,000, providing local public approval thereof was secured.

In the 1956 general election, Pres. Dwight D. Eisenhower was given a plurality of more than 60,000 of Rhode Island's votes compared with the plurality of about 7,600 that he received in 1952. The state's two congressmen, John E. Fogarty and Jaime J. Forand, both Democrats, were re-elected.

The contest for the governorship was the closest election in Rhode Island history. The count of all ballots, including those of absentee civilians, shut-ins and the armed services, gave Republican Christopher Del Sesto a plurality of 427 votes. On a case initiated by the incumbent governor, Dennis J. Roberts (Dem.), the state's supreme court in a 3-to-1 decision handed down on inauguration day, Jan. 1, 1957, ruled, in effect, that the provision of law allowing absentee civilians and shut-ins to vote before election day was unconstitutional. Upon all such ballots being invalidated, a total of 4,954 out of 5,602, Roberts was re-elected to office with an unofficial plurality of 66 votes out of a total vote of 384,562.

The other executive officers, whose election was unaffected by absentee voting, were Armand H. Coté, lieutenant governor; John A. Notte, Jr., secretary of state; William E. Powers, attorney general; and Raymond H. Hawksley, general treasurer. All were Democrats.

Education.—During 1955-56, there were enrolled in the public elementary and pre-elementary schools 77,788 pupils and 2,816 teachers; in junior high schools 20,686 pupils and 991 teachers; in senior high schools and vocational schools 18,333 pupils and 996 teachers. Pupils attending private schools numbered: elementary and pre-elementary 31,358; junior high 6,696; senior high 6,594. The total number of teachers in private day schools was 1,468. Current expenditures for day schools in 1955-56 were \$33,533,870 and for evening schools \$85,427. The commissioner of education in 1956 was Michael F. Walsh, working under the state board of education of seven members whose chairman was C. B. Collins.

Social Insurance and Assistance, Public Welfare and Related Programs.—There were 29,721 persons receiving some type of direct monetary public assistance as of Aug. 31, 1956, a reduction of 890 from the preceding year. During the year Sept. 1, 1955, through Aug. 31, 1956, the total amounts paid out in the different categories of aid were as follows: old-age assistance \$5,335,023; aid to dependent children \$4,322,540; aid to the disabled \$1,207,224; aid to the blind \$127,767; general public assistance \$3,470,365; soldiers' welfare \$253,053; in addition, the first four categories were receiving medical services at an estimated annual cost of \$1,300,000. In June 1956 there were 58,094 persons receiving old-age and survivors insurance benefits at a total monthly rate of \$3,240,953. During the year ending June 30, 1956, 536,424 benefit payments amounting to \$12,810,316 were made from the unemployment compensation fund, receipts into which totalled \$17,265,661. In the same period 262,998 payments totalling \$6,489,999 were drawn from the temporary disability insurance fund, i.e., for those unemployed because of illness; receipts amounted to \$6,982,658. On July 31, 1956, there were 659 inmates in corrective institutions and 5,639 patients in state-operated institutions including 4,284 in institutions for the mentally ill or defective.

Communications.—In Oct. 1956, the total miles of highway in the state were 4,074, of which 1,414 mi. were in the state highway system with 883 mi. thereof having been built by the state. In Oct. 1956 railroads were operating 185.2 mi. of track in the state.

Water-borne commerce of the state for 1954 totalled 7,933,091 tons, of which 1,027,320 tons were foreign commerce (imports 978,008 tons, exports 49,312 tons); 6,207,835 tons were coastwise (receipts 5,788,375 tons, shipments 419,460 tons).

As of Oct. 1956 there were four publicly owned (state) airports and three privately owned and active airports. There were also two naval air stations owned by the United States.

Banking and Finance.—There were 22 banking institutions in 1956. Resources of 16 banks under state supervision totalled \$820,131,173; those of 6 banks under federal supervision totalled \$508,509,033. Savings deposits (exclusive of club accounts) in savings banks and trust companies (the 16 state banks) amounted to \$479,807,320 on June 30, 1956. In addition, 6 loan and investment companies had resources of \$7,167,632; 7 building and loan associations \$158,729,819; 69 credit unions \$42,382,243. This state closed its fiscal year on June 30, 1956, with receipts totalling \$75,127,894.04 (including federal grants of \$12,603,248.71); expenditures and encumbrances \$74,212,365.01; operational surplus \$915,529.03; free surplus \$5,243,327.62. The state gross debt was \$54,757,659.57; net debt after deducting sinking fund assets \$43,732,659.57.

Agriculture.—The estimated total acreage of principal crops harvested in 1956 was 34,880. Cash income from crops in 1955 was \$5,988,000; from livestock and livestock products \$15,744,000; from governmental payments \$54,000; total gross farm income \$21,786,000. The estimated value of livestock on Jan. 1, 1956, was \$5,875,000, excluding commercial broilers.

On Jan. 1, 1956, the livestock population of the state included 1,000 horses and mules; 19,000 milk cows; 6,000 other cattle; 12,000 hogs and pigs; 2,000 sheep and lambs; 472,000 chickens; and 4,000 turkeys. Livestock products in 1955 included 133,000,000 lb. of milk valued at \$9,246,000; 3,310,000 lb. of chickens, \$734,000; 4,812,000 lb. of commercial broilers, \$1,241,000; 920,000 lb. of turkeys, \$341,000; 6,667,000 dozen eggs, \$3,486,000.

Industry and Manufacturing.—As reported by the state department of labour, the estimated number employed in Rhode Island in Aug. 1956 was 298,600, an increase of 2,500 over Aug. 1955. Employment was distributed as follows: manufacturing 131,800; contract construction 19,000; government (federal, state and local) 35,600; retail and wholesale trade 54,900; transportation and public utilities 15,800; finance, insurance, real estate 13,000; service (medical, legal, etc.) 27,700; miscellaneous 800. (Farmers,

Table I.—Leading Agricultural Products of Rhode Island

Crop	Indicated 1956	1955	Average, 1945-54
Corn, bu.	270,000	276,000	304,000
Hay, all, tons	37,000	38,000	46,000
Alfalfa hay, tons	9,000	9,000	4,000
Potatoes, cwt.	912,000	1,002,000	806,000*
Apples (commercial), bu.	100,000	180,000	160,000
Peaches, bu.	13,000	16,000	14,000

*1949-54.

Source: U.S. Department of Agriculture.

Table II.—Principal Industries of Rhode Island

	All employees 1954	Salaries and wages 1954 (in 000s)	Value added by manufacture 1954 (in 000s)	Value added by manufacture 1953 (in 000s)
Food and kindred products	6,122	\$ 22,638	\$ 40,615	*
Textile mill products	35,159	116,809	175,544	\$266,021
Apparel and related products	3,933	9,659	17,476	
Rubber products	5,366	20,451	34,868	39,094
Stone, clay, glass products	2,003	7,802	14,443	
Primary metal industries	5,805	24,034	48,838	50,816
Fabricated metal products	7,326	25,383	40,791	34,752
Machinery (except electrical)	11,796	47,412	75,036	
Electrical machinery	4,663	15,921	30,036	37,613
Miscellaneous manufactures	27,136	80,185	128,647	161,793

*Withheld because the estimate did not meet publication standards, either on the basis of the associated standard error of estimate or on the basis of a consistency review.

Source: U.S. Department of Commerce, 1954 Census of Manufactures, preliminary report.

Table III.—Mineral Production in Rhode Island
(In short tons)

	1953		1954*	
	Quantity	Value	Quantity	Value
Total		\$1,462,000		\$1,461,000
Sand and gravel	898,000	776,000	1,013,000	980,000
Stone	162,000	617,000	†	†
Other minerals . . . . .	...	69,000	...	481,000

*Preliminary.

†Value included with other minerals.

Source: U.S. Bureau of Mines.

self-employed, domestics and armed service personnel are excluded.)

Manufacturing employment in Aug. 1956 totalled 131,800 which was 700 (rev.) more than a year earlier; average hourly earnings were \$1.68 and the average weekly earnings for all manufacturing employees was \$65.53. Wage earners were distributed among the manufacturing industries as follows: textiles 38,100; metals and machinery 33,500; jewelry-silverware 24,800; rubber products 5,500; apparel 3,700; instruments-optical 4,000; food-beverage 5,000; miscellaneous 17,200. (Jo. C. M.)

Mineral Production.—Rhode Island's mineral production ranked 47th among the states in the value of output in 1954, and included principally building materials. Table III shows the tonnage and value of those mineral commodities produced in Rhode Island in 1953 and 1954 whose value exceeded \$100,000.

ENCYCLOPEDIA BRITANNICA FILMS.—*Northeastern States*, 2nd ed. (1955); *Rhode Island* (1955).

Rhodesia and Nyasaland, Federation of.

This is a federation of three British central African countries: Northern Rhodesia, protectorate (north of the Zambezi river); Nyasaland, protectorate (east of Northern Rhodesia); and Southern Rhodesia, self-governing colony (south of the Zambezi). The federation is bounded north by Tanganyika and the Belgian Congo, south by Bechuanaland and the Union of South Africa, west by Angola and east by Mozambique. Area: 489,854 sq.mi.; pop. (1956 est.): 7,257,000 (including 18,950 Asians and 10,750 coloured). Language: English, tribal dialects and (in southern Rhodesia) Afrikaans. Religion: Moslem, Christian, pagan. Federal capital, Salisbury, Southern Rhodesia. Governor general, Lord Llewellyn; federal prime ministers in 1956: Viscount Malvern and (from Nov. 2) Sir Roy Welensky.

Northern Rhodesia.—Area: 290,323 sq.mi., including 3,000 sq.mi. of lakes. European pop.: (1951 census) 40,842; (1956 preliminary census) 64,000. African pop. (1956 est.): 2,110,000. Total pop. (1955 est.): 2,130,000. Chief towns (pop., 1954 est.: European pop., 1956 preliminary census in parentheses): Lusaka (cap.) 64,500 (7,800); Kitwe 78,802 (9,700); Ndola 60,500 (6,800); Luanshya 58,500 (6,000); Broken Hill 45,000 (4,200); Mufulira 42,421 (5,600); Chingola 36,100 (4,600). Governor in 1956, Sir Arthur Benson.

Nyasaland.—Area: 49,177 sq.mi., including 11,600 sq.mi. of lakes. European pop.: (1951 census) 1,948; (1956 preliminary census) 7,500. African pop. (1956 est.): 2,580,000. Total pop. (1955 est.): 2,540,000. Chief towns: Zomba (cap.), pop. (1953 est.) 5,000; Blantyre, 17,000. Governor in 1956, Sir Robert Armitage.

Southern Rhodesia.—Area: 150,354 sq.mi. European pop.: (1951 census) 135,596; (1956 preliminary census) 175,800. African pop. (1956 est.): 2,290,000. Total pop. (1955 est.): 2,399,000. Chief towns: Salisbury (cap.), pop. (1953 est.) 90,024, European pop. (1956 preliminary census) 34,740; Bulawayo, European pop. only (1956 preliminary census) 33,200. Governor in 1956, Vice-Adm. Sir Peveril William-Powlett; prime minister, Reginald Stephen Garfield Todd.

History.—The International Bank for Reconstruction and Development approved a loan for the Kariba hydroelectric scheme on the Zambezi river in April 1956, and £28,000,000 was provided, which, together with £38,000,000 from Rhodesian sources (copper mining companies, banks and the federal government) and £18,000,000 from Great Britain (Colonial Development corporation and Commonwealth Development Finance company), amounted to more than the £80,600,000 necessary for the first stage. Main contracts were awarded in July. Completion of

the diversion tunnel and other initial works was on time. Movement of Africans from the inundation area started. A barrage was constructed across the Shiré river, Nyasaland, at Liwonde, as part of the Shiré valley project for stabilization of Lake Nyasa and provision of power.

Lord Malvern retired as prime minister on Oct. 31 and was succeeded by Sir Roy Welensky. Welensky, formerly leader of the unofficial members of the Northern Rhodesia legislature, became a member of the first federal cabinet and deputy prime minister under Lord Malvern. Winston Field, a Marandellas farmer, was elected leader of the Dominion party, composed of most antigovernment elements. Welensky was elected leader of the Federal party. The campaign for the declaration of the federation's independence within the commonwealth gathered momentum during the year.

The national income rose from £236,000,000 in 1954 to £309,000,000 in 1955. Revenue spending estimated for 1956–57 was nearly £54,000,000 and loan expenditure was £27,700,000. There was a favourable trade balance of £40,000,000. A Federal Central bank was established in April.

The importance of the federation as a source of minerals, particularly base metals, was shown by the figures published for 1955. The total value of all minerals produced was approximately £141,000,000. Copper from Northern Rhodesia contributed £113,000,000; asbestos and gold from Southern Rhodesia £7,000,000 and £6,500,000 respectively.

Immigration was restricted to 20,000 persons during 1956 following an initial intake at the rate of 30,000 a year. A higher proportion of immigrants from Great Britain was sought by restricting those from elsewhere. Strikes occurred in the copper mines of Northern Rhodesia; a state of emergency was declared, and a commission of inquiry set up. A short state of emergency was also proclaimed in Southern Rhodesia when African railway workers struck in October. Conditions announced for the federal public service showed no discrimination. Plans were made for private enterprise to take over the Rhodesian Iron and Steel commission which had been operating under the Southern Rhodesian government since its inception. Central African Airways introduced Viscount aircraft on main routes, including the London service. Applications for the new university (scheduled to open in March 1957) showed a majority of Europeans for the 180 available residential places. (M. Nn.)

Education.—*Northern Rhodesia* (schools, 1953): European primary 38, pupils 9,336 (of which 7 with secondary department, pupils 1,430); coloured and Asiatic primary and secondary 8, pupils 492; African primary pupils 167,129 (of which 15,742 middle school) and secondary 430; African teachers in training 807; African vocational 41, pupils about 2,090. *Southern Rhodesia* (schools, 1952): European primary 147, pupils 22,328, teachers 561 (incl. 52 aided and recognized private, all levels); secondary 18, pupils 6,497, teachers 360; aided farm 17, pupils 119; coloured and Asian 21, pupils 3,769; African primary 2,154, pupils 231,551, teachers 6,598; postprimary 18, pupils 1,575, teachers 99; vocational courses: teacher-training colleges 22, students 961; institutes of higher (technical) education 2. *Nyasaland* (schools, 1954): government European primary 3, government coloured primary 1; African primary 4,688 (including 3 government), pupils 237,000; African secondary 4 (including 1 government and 1 multilateral with vocational departments), pupils 311; Asian primary pupils 790; African teachers in training 554 at 11 centres (incl. 1 government); African vocational pupils 730.

Finance and Banking.—Monetary unit: Rhodesian pound (£R1=£1 sterling). Currency circulation: (April 1955) £15,359,365, (April 1956) £16,336,695. Deposit money: (Dec. 1953) £45,900,000, (March 1956) £89,942,553. Budgets: *federal state* (1955–56 est.), revenue £39,065,000, expenditure £61,078,115; (1956–57 est.) revenue £50,000,000, expenditure £53,900,000.

Foreign Trade.—(1955) Imports £R138,576,000, exports £R177,919,000. Principal exports: metals and metal manufactures £R120,110,417, tobacco £R26,096,066, minerals, foodstuffs.

Transport and Communications.—Railways (1954): *Rhodesia* (Northern and Southern) 4,018 km.; *Nyasaland* 505 km. Roads (1954) 78,963 km. Motor vehicles in use (1954): passenger 70,700, commercial 36,800. Air transport (1953): 130,968,000 passenger-km.; freight, 1,596,000 ton-km. Telephones (Jan. 1955) 53,245. Radio receiving sets (*N. Rhodesia* and *Nyasaland*, 1954) 28,000, (*S. Rhodesia*, 1951) 24,000.

Agriculture.—Main crops (metric tons): *Southern Rhodesia*, millet and sorghum (1953) 205,000; peanuts (1953) 75,000; maize (1954, farms and estates only) 246,000. *Nyasaland*, peanuts (1953) 7,000; tea (1954 exports) 7,600; tung oil (1954) 928; maize (1954) 52,000; cottonseed

(1955) 5,000; cotton, lint (1955) 3,000. *Northern and Southern Rhodesia*, flue-cured tobacco (1954-55) 128,200,000 lb.; (1955-56 est.) 157,500,000 lb. Livestock: *Southern Rhodesia* (Sept. 1955) cattle 3,077,000, sheep 2,271,000, pigs 111,000. *Northern Rhodesia* (Sept. 1954) cattle 985,000, sheep 79,000, pigs 43,000. *Nyasaland* (Sept. 1954) cattle 292,000, sheep 53,000, pigs 83,000.

Industry.—Production (metric tons, 1955): *Southern Rhodesia*, coal 3,312,000; chrome ore 459,000; tungsten 231; asbestos 107,400; iron ore (metal content, 1954) 35,400. *Northern Rhodesia*, copper, smelter 348,000; zinc, smelter 28,320; lead, refined 16,320; copper ore (metal content, 1954) 384,700. *Federation* (1955) gold 525,000 fine ounces. *Northern and Southern Rhodesia* (1954) electricity 2,231,000,000 kw.hr.; *Nyasaland* (1953) 3,700,000 kw.hr.

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Rice. The U.S. 1956 rice crop of 46,225,000 bags (of 100 lb. each) was 14% less than the 53,532,000 bags of 1955 and the smallest crop since 1950, but exceeded by 8% the 42,756,000 bag average for 1945-54. In close accord with reduced official acreage allotments, an estimated 1,618,500 ac. were seeded, the smallest acreage seeded to rice since 1946 and 12% below 1955. The yield, indicated at 2,885 lb. per acre, was below the record 3,292 lb. of 1955 but far above the 1945-54 average of 2,254 lb. per acre. The leading states were Louisiana with 11,575,000 bags; Arkansas, 11,339,000 bags; Texas, 11,048,000 bags; and California, 10,868,000 bags. Rice, as one of the basic crops, participated in the 1956 acreage reserve of the soil bank, with payments at a base unit rate of \$2.25 per hundredweight for normal yields on allotted acreage diverted to the reserve.

The national average support price for the 1956-crop rice was \$4.57 per hundredweight, adjusted to class or variety, grade and location. The price of rough rice to producers in Oct. 1956 of \$4.71 per hundredweight was slightly higher than the \$4.60 of a year earlier. Exports of rice in 1955-56 were 11,346,000 bags, substantially above the 9,848,000 bags of 1954-55, but far below the 17,159,000 bags of 1952-53.

World rice production in 1956-57 was estimated at a record 431,776,000,000 lb. (rough), 2% above the preceding year, also a record.

Rice Production of the Principal Producing Countries

(In millions of pounds: rough)

Country	Preliminary 1956-57	1955-56	Average 1945-46 to 1949-50
China	148,000	145,500	126,000
India	90,000	88,000	76,000
Pakistan	30,200	26,500	26,889
Japan	29,000	32,505	24,735
Indonesia . . . . .	..	24,750	19,300
Thailand	17,300	16,200	11,976
Burma	15,000	14,400	10,500
Brazil . . . . .	..	7,600	6,106
Philippine Republic	7,519	7,135	4,872
Korea	7,000	7,000	5,916
Formosa . . . . .	..	5,266	2,997
United States	4,522	5,353	3,548

The important Japanese crop of 1956 was somewhat damaged by an August typhoon.

World exports of rice in 1955 were 11,320,000,000 lb. (milled basis), 8% more than the preceding year, and a new post-World War II record. The far east exported 8,500,000,000 lb., as compared with an average of 4,600,000,000 lb. in the 1946-50 period. Burma exported about 4,250,000,000 lb. in 1955-56, mostly to India. Western Europe imported 1,286,000,000 lb., 39% more than the year before, but only 44% of the prewar average.

(J. K. R.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Story of Rice* (1952).

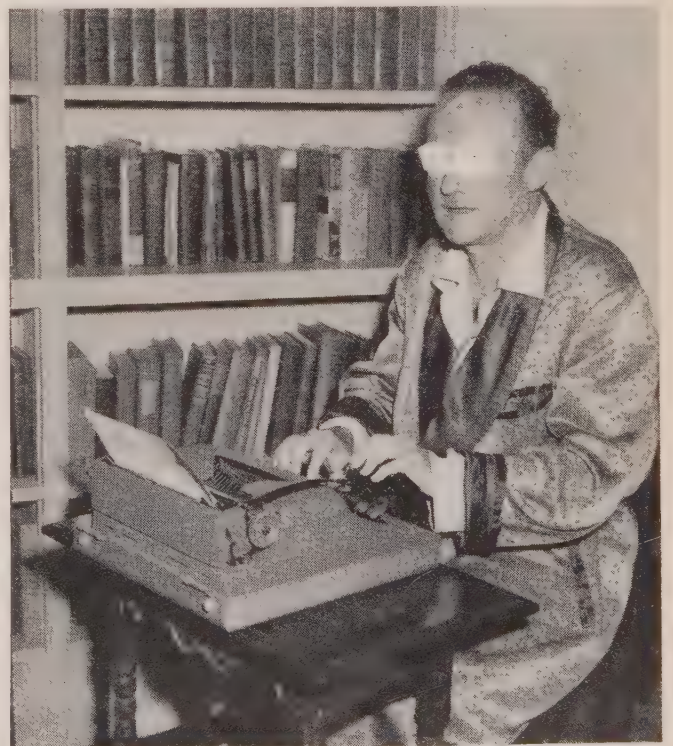
Richards, Dickinson Woodruff (1895-), U.S. physician and co-winner of the 1956 Nobel prize in medicine and physiology with André F. Cournand and Werner Forssmann (qq.v.). The three were honoured for their joint research that led to new methods of diagnosing and treating heart disease.

Born at Orange, N.J., on Oct. 30, 1895, Richards graduated from Yale university in 1917, took a master's degree at Columbia university in 1922 and received his medical degree from Columbia the next year. After study in England he began his research in heart and lung physiology at Columbia university's college of physicians and surgeons in 1928 and was named Lambert professor of medicine there in 1947. In 1945 he also became director of Columbia's medical division at Bellevue hospital in New York city. During World War II Richards specialized in research on the effects of shock.

Working with Cournand, whom he first met in 1932 at Columbia, Richards adapted the pioneer experiments of Forssmann to measure blood pressure and make-up inside the human heart, later extending these measurements to the lungs and the general circulatory system. The citation accompanying the Nobel award announced Oct. 18, 1956, at Stockholm, Swed., noted that the trio's research meant that "... diagnosis [of heart disease] can now be made earlier and with greater certainty than before."

Riesel, Victor (1915-), U.S. newspaperman who was blinded in an acid-throwing attack thought to have been inspired by New York city labour racketeers in 1956. Riesel had just finished a radio broadcast attacking leaders of a local union and was leaving a restaurant near Times square early in the morning of April 5 when his assailant splashed sulphuric acid in his face. A month later he was permanently blind. Despite the handicap he returned to his desk at the *New York Mirror* and Hall Syndicate to continue his syndicated labour column in more than 275 newspapers. The federal bureau of investigation announced on Aug. 17 that it had identified Riesel's assailant—a minor Brooklyn gangster named Abraham Telvi who had himself been murdered on New York's lower east side July 28. A few days later FBI agents arrested Johnny Dioguardia (Dio), labour racketeer, and four others, and charged Dio with conspiracy to make arrangements for Telvi's attack on Riesel.

Riesel, born in Manhattan on March 26, 1915, attended the City College of New York at night, ultimately receiving a mas-



BLINDED COLUMNIST Victor Riesel returning to his typewriter less than two weeks after being attacked by acid-throwing hoodlum

ter's degree. (His father, a union business agent and antiracketeering crusader, died in March 1947 as the result of permanent injuries sustained in gangster beatings.) The younger Riesel began reporting in 1930 and in 1943 started his labour column. Previously he had been a reporter for a number of labour publications, including Canadian, British and Australian newspapers.

Rio De Oro: see SPANISH COLONIAL EMPIRE.

Rivers and Harbours. The active navigation program of the U.S. army corps of engineers in 1956 included 2,300 congressionally authorized projects, with an estimated cost of \$4,300,000,000. Congressional appropriations through fiscal year 1956 for this program totalled \$1,900,000,000, leaving \$2,400,000,000 as the amount required to complete the projects. If multiple-purpose projects serving navigation purposes were added, the total estimated cost of the program would become \$6,500,000,000, of which \$2,800,000,000 had been appropriated through fiscal year 1956. In addition, about \$1,500,000,000 had been appropriated by the congress through fiscal year 1956 for the maintenance and operation of these improvements.

For the fiscal year 1957 congress appropriated \$635,000,000 for work on the civil works program of the corps of engineers. The navigation segment of the program received approximately \$133,000,000 for construction work, \$68,000,000 for operation and maintenance, and lesser amounts for planning investigations and surveys and miscellaneous items. Multiple-purpose projects, many of which serve navigation purposes, received \$158,000,000 for construction, \$12,000,000 for operation and maintenance, and smaller amounts for other items. Some of the principal amounts for river improvements in fiscal 1957 were as shown in Table I.

Table I.—River Improvements Appropriations, 1956-57

Project	Amount
Warrior lock and dam on the Warrior river, Alabama	\$4,580,000
Emergency bank stabilization on the Arkansas river and tributaries, Arkansas	3,000,000
Buford dam, Chattahoochee river, Georgia	4,553,000
Markland lock and dam, Ohio river, Indiana, Kentucky and Ohio	5,000,000
Missouri river, from the mouth to Sioux City, Ia.	12,800,000
Greenup locks and dam, Ohio river, Kentucky and Ohio	9,900,000
Delaware river, Philadelphia to Trenton, interim 35-ft. project	6,000,000
New Cumberland locks and dam, Ohio river, Ohio and West Virginia	8,000,000
The Dalles dam, Columbia river, Oregon and Washington	42,457,000
Ice Harbor lock and dam, Snake river, Washington	8,000,000

Some of the principal amounts for harbour improvements by the corps of engineers in fiscal year 1957 were as shown in Table II.

Table II.—Harbour Improvements Appropriations, 1956-57

Project	Amount
Mobile harbour, Alabama	\$2,543,000
Redondo Beach harbour, California	1,750,000
Richmond harbour, California	1,850,000
Tampa harbour, Florida	4,000,000
Hawaihae harbour, Hawaii	1,700,000
Boston harbour, anchorage, Massachusetts	1,000,000
Wilmington harbour, North Carolina	1,543,000
Ashtabula harbour, Ohio	1,800,000
Cleveland harbour, Ohio	1,700,000
Norfolk harbour, Craney Island disposal area, Virginia	1,784,000

A survey was initiated in the fiscal year 1957 to determine the advisability of further improvements to the harbours of the Great Lakes in the interest of present and prospective deep-draught commerce, with particular regard to the scheduled completion of the St. Lawrence Seaway and deepening of the connecting channels between the Great Lakes. (E. C. I.)

Canada.—With growing development in Canada's northland, the traffic on the Mackenzie river had increased 282% since 1945. Freight in 1955 amounted to 162,000 tons. Aimed at improving navigation on the 1,600-mi. Athabasca-Great Slave-Mackenzie waterway from northern Alberta to the Arctic ocean, a program was initiated by the federal department of transport

to provide additional and more adequate navigational aids. A new district marine agency, the 11th in Canada, was established at Fort Smith, Northwest Territories, to oversee that department's increasing duties in the Northwest Territories and western arctic.

Traffic handled at the eight harbours of Canada administered by the national harbours board continued to increase. Most of the smaller harbours also showed increased traffic. Total cargo tonnage in the national harbours in 1955 showed an increase of 4% over 1954—42,414,822 tons as compared with 40,890,853 tons.

Some important additions to port facilities were completed and put into operation during 1956, and contracts were let for others. At Churchill, Man., reinforced-concrete storage addition to the grain elevator doubled the grain storage capacity to 5,000,000 bu. At the Pugsley wharf at Saint John, N.B., a new transit shed was built, increasing total shed capacity by 13% and enabling 117,000 tons in transit to be accommodated per month. To provide for adequate facilities at the port of Montreal, Que., to meet changed conditions when the St. Lawrence Seaway was completed, new wharves were built, the level of one of the piers was raised and new sheds and grain galleries were provided. To meet increased traffic at the port of Halifax, N.S., a contract was awarded for a new 1,050-ft. deep-sea pier to provide berths for four ships. In Vancouver, B.C., the depth of the entrance to the channel was being increased from 35 ft. to 40 ft., and additional grain elevator equipment was being installed.

(See also CANALS AND INLAND WATERWAYS; UTAH.)

(W. H. V. A.)

ENCYCLOPEDIA BRITANNICA FILMS.—*The Great Lakes—Highway of Commerce* (1951); *The Great Lakes—How They Were Formed* (1951); *The Great Lakes—Their Link With Ocean Shipping* (1951); *Inland Waterways* (1956); *Water Power* (1937).

Roads and Highways. **United States.**—During 1956 highway construction in the United States exceeded all previous levels. Estimates indicated that about 35,000 mi. of principal highways would be completed at a cost of \$3,791,000,000, plus construction of 88,000 mi. of local roads and streets costing \$1,722,000,000. With maintenance, administration and interest added to these capital outlays, highway expenditures were expected to reach \$8,220,000,000. All streets and highways, improved and unimproved, totalled 3,450,000 mi.

The federal-aid highway program accelerated considerably, and projects completed during the fiscal year ended June 30, 1956, totalled 22,918 mi. The Federal-Aid Highway act of 1956 launched the greatest road-building program in U.S. history. The huge 13-year program for a national system of interstate and defense highways made provision for a 41,000-mi. network of modern roads and expressways connecting all 48 states and linking 209 cities of more than 50,000 population.

The 1956 act authorized nearly \$25,000,000,000 of federal funds for the interstate system. All but about 7,000 mi. of this system, in lightly travelled areas, would consist of four- to eight-lane divided highways with urban connections, interchanges and bypasses.

The 1956 act also increased federal aid for other highways apart from the interstate system. Authorizations for the fiscal year 1957 were increased \$125,000,000; and \$850,000,000 and \$875,000,000 were authorized for fiscal years 1958 and 1959, respectively—45% for the federal-aid primary system, 30% for the secondary system and 25% for urban highways.

Africa.—Highway building increased in 1956 throughout the continent, chiefly development roads providing market outlets for hitherto inaccessible areas, with minor attention to cross-continent routes such as the Morocco-Egypt, Cape-to-Cairo and Pan-Arabian International highway. French Equatorial Africa

embarked on a five-year, \$15,000,000 highway program; Liberia completed its first five-year highway program at a cost of \$6,000,000, improving 125 mi. and constructing 50 mi., had \$7,000,000 under contract for 144 mi. of new roads and proposed to spend \$8,000,000 on 150 mi. by 1960. Nigeria added or improved 700 mi. of roads each year after 1948 to bring the total to 32,000 mi. with 1,900 mi. paved. The Belgian Congo completed 84 mi. of new roads in 1956 costing \$11,000,000 and planned a system of 8,694 mi. by 1960. The Union of South Africa completed 1,350 mi. at a cost of \$51,000,000 on a total system of 198,000 mi., half all-weather roads.

Rhodesia and Nyasaland completed 542 mi. of the Great North road (Cape-to-Cairo) at a cost of \$3,000,000. Tanganyika added 125 mi. in 1956 from Dar es Salaam to the Great North road, and 200 mi. on the Great North road costing \$3,800,000; and Egypt completed the four-lane limited-access Cairo-Alexandria road costing \$120,773 per mile as part of a national program to build 8,694 mi. in a \$250,000,000 ten-year program. Allotment of \$8,400,000 was made for the Pan-Arabian highway.

South America.—Colombia built 124 mi. of new road in 1955-56, increasing the network to 15,525 mi. of which 1,180 mi. were paved and 11,178 mi. were all-weather. Ecuador planned to spend \$35,000,000 for highways in three years to complete the Pan-American highway by adding 559 mi. of new road; the 100-mi. Cuenca-to-the-Pacific road, under construction for 20 years, was finished. Bolivia improved 200 mi. in 1956, making 230 mi. paved, 600 mi. macadam and 1,500 mi. all-weather in a total of 13,800 mi. Chile began a five-year program to build 3,937 mi. and improve 3,291 mi. Argentina built 499 mi. of new roads at a cost of \$50,000,000 in 1956, had 6,849 paved and 25,547 all-weather in a total of 93,393 mi., and proposed to spend \$83,300,000 for construction by 1960. Uruguay spent \$8,000,000 to increase its highway system to 5,279 mi. Brazil had 1,242 mi. paved in a 117,990-mi. road network, and Venezuela added 266 mi. of roads in 1956, making a 6,416-mi. system with 484 mi. surfaced.

Asia.—Afghanistan in 1956 built new highways to serve the Kandahar irrigation system and improved the Oxus river-Soviet border road. India concentrated effort on the 800-mi. Delhi-Bombay and 270-mi. Calcutta-Siliguri roads, while 200 mi. of the India-Tibet route neared completion; state construction added 2,339 mi. to swell India's total highways to 268,000 mi. In 1956 a total of 7,200 mi. was completed at a cost of \$138,000,000. In Ceylon a coastal road to serve the \$3,000,000 Kallany bridge was improved at a cost of \$1,100,000. Nepal completed 79 mi. of macadam road from the interior to the Indian border.

Australia.—A ten-year, \$1,100,000,000 highway-building program to improve Australia's 524,478-mi. system, of which 70,383 mi. were main roads, was under way. New Zealand spent \$77,000,000 on 260 mi. of new roads; it had 43,650 mi. of all-weather roads in a 50,650-mi. system.

Canada.—On the Trans-Canada highway 2,583 mi. of the 4,580 mi. between St. John's, Nfld., and Victoria, B.C., were paved by 1956 at a cost of more than \$100,000,000.

England.—Great Britain, half through a four-year improvement program, expended \$132,000,000 during 1956 on 100 projects, bypassing population centres and easing traffic snarls at main intersections.

Europe.—The highway modernization progress was unprecedented, with a 29,078-mi. system of international roads rehabilitated by 1956, including the following: Austria 1,102 mi.; Belgium 668; Denmark 428; Finland 1,453; France 4,095; Federal Republic of Germany 3,706; Greece 1,360; Italy 3,735; Luxembourg 56; Netherlands 714; Norway 1,329; Portugal 534; Spain 1,193; Sweden 2,282; Switzerland 714; Turkey 2,692; United Kingdom 959 and Yugoslavia 1,056. Sweden spent \$80,000,000

in 1956 as part of a \$1,350,000,000 long-range program for construction of 1,056 mi. of four-lane road and 8,073 mi. of new highways to increase the existing 34,776-mi. network. Finland from 1953 through 1956 improved or constructed 3,300 mi. of all types of roads and planned to add 120 mi. of surfaced roads to an existing 1,180 mi. West Germany proposed to spend \$1,400,000,000 in ten years to reconstruct 6,676 mi. of war-damaged roads, build 596 mi. of new roads and improve 863 mi. through cities; of the 544 bridges on main roads destroyed, 506 had been rebuilt. Belgium inaugurated a \$6,000,000,000, 16-year highway improvement program, half to be spent on superhighways. France completed 81 mi. of expressways and inaugurated a five-year, \$1,000,000,000 program to add 592 mi. of superhighways and 99 mi. of bypasses to its 49,680-mi. national network and 347,760 mi. of departmental and local roads. Switzerland planned 186 mi. of new roads by 1960 to increase its 10,350-mi. network, half of which was paved. Spain completed its first and began a second five-year plan to spend \$19,000,000 annually improving 621 mi. each year of its 74,994-mi. highway system. Italy neared completion in 1956 of a 458-mi. highway shortening the Milan to Naples route by 70 mi. at a cost of \$300,000,000; a 2,900-ft. tunnel plus 13 overpasses in 2½ mi., costing \$4,800,000, shortened by 10 mi. the Turin-Po river route. Construction of 7,452 mi. during 1955-56 in southern Italy increased the total highway network to 105,994 mi. Greece expended \$16,100,000 during 1954-56 on 697 mi. of paved roads and to improve 298 mi., including 36 major and 82 small bridges. Yugoslavia committed \$6,300,000 for construction of 135 mi. on six main roads by 1958. Austria constructed 106 mi. of new highway during 1956.

Near East.—Turkey received \$46,000,000 from the United States for highway assistance in the period 1949-56 and had a 15,247-mi. integrated system with 3,807 mi. paved or surfaced and less than 1,366 mi. unimproved. Lebanon completed a 4-mi. section of four-lane paved highway between Beirut and Ma'ameltein, inaugurating its first ten-year construction program of 348 mi. of national roads. Syria completed the 274-mi. Jidda-Medina road in 1956 and continued building on the 1,000 mi. Trans-Arabian route from the Mediterranean to the Persian gulf. Jordan had rebuilt and surfaced about 62 mi. since 1954 on a proposed 332-mi. national system. The government of Iraq began a five-year highway improvement program expected to cost \$150,000,000 and had 1,250 mi. under construction with top priority assigned to the 60 mi. between Samarra and Baiji on the Baghdad-Mosul highway. Iran proposed to spend \$84,000,000 during 1955-61 to improve 621 mi. per year and add 3,105 mi. of new roads to its existing 7,452-mi. primary and 8,694-mi. secondary systems.

Far East.—Thailand spent \$22,000,000 on 39 mi. of new roads between Bangkok and the Burma border and on 101 mi. in the northeast provinces. Malaya completed a 29-mi. east-west cross-country highway begun in 1950 and costing \$31,000,000. Since 1947 China had doubled its road length, with 84,000 mi. travelable and 23 new roads planned. Japan approved a \$2,000,000,000 20-year program for a highway network connecting all major cities with a toll road through the mountains from Nagoya to Tokyo. Korea had rebuilt 42% of the 1,576 war-destroyed bridges, and planned replacement of the remainder under a six-year bridgebuilding program concurrent with construction of 414 mi. of new surfaced roads. The Philippines completed 134 mi. of development roads on Mindanao costing \$6,900,000 during 1953-56 and proposed 327 additional miles. There were 9,911 mi. of first class, 5,486 mi. second class and 3,123 mi. third class in the 18,520-mi. highway system.

Mexico.—The republic spent \$1,000,000 on approximately 1,242 mi. of new roads in 1956. Mexico had 9,259 mi. on the fed-

eral system divided between five longitudinal routes from the United States border south and three transverse Gulf-to-the-Pacific routes, with a fourth planned. There were 60,000 mi. of dry-weather roads in addition to 18,500 mi. all-weather roads, including 11,750 mi. paved.

Central America.—After the first year of a three-year accelerated building program, progress on the 1,574-mi. Mexico-to-Panamá Inter-American highway appeared thus: in Guatemala, 84 mi. had been paved, with a 25-mi. impassable and a 158-mi. substandard section under construction and 50 mi. all-weather road completed for a total of 317 mi.; El Salvador, 195 mi. paved; Honduras, 24 mi. standard all-weather, 21 mi. substandard under construction and 49 mi. substandard all-weather, total 94 mi.; Nicaragua, 132 mi. paved, 19 mi. standard all-weather, 40 mi. substandard under construction, 47 mi. substandard all-weather, total 238 mi.; Costa Rica, 60 mi. paved, 146 mi. substandard under construction, 73 mi. standard all-weather, 56 mi. impassable under construction, 78 mi. impassable, total 413 mi.; Panamá, between the Costa Rica border and the Panama canal, 98 mi. paved, 11 mi. standard all-weather, 62 mi. substandard under construction, 131 mi. substandard all-weather, 14 mi. impassable, total 316 mi. Between the Panama canal and Colombia on the Pan-American highway were 40 mi. of passable road and approximately 200 mi. unsurveyed.

(See also BUILDING AND CONSTRUCTION INDUSTRY; MOTOR TRANSPORTATION; TOURIST TRAVEL.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Arteries of New York City* (1952); *Cities—How They Grow*, 2nd ed. (1953); *The Living City* (1953).

Rockefeller Foundation: see SOCIETIES AND ASSOCIATIONS, U.S.

Rockets: see JET PROPULSION; MUNITIONS.

Rodeos: see SHOWS.

Roman Catholic Church. In 1956 the College of Cardinals, which in its full complement numbers 70 members, was reduced to 60 by the death of two of its members: Bernard Cardinal Griffin, archbishop of Westminster, primate of England (on Aug. 20), and Jules Cardinal Saliège, archbishop of Toulouse in France (on Nov. 5).

Aloysius Cardinal Stepinac, spiritual leader of Yugoslavia's 7,000,000 Catholics, was still deprived of his liberty ten years after his condemnation by Marshal Tito's communist regime.

Joseph Cardinal Mindszenty, primate of Hungary, who had been freed from his prison Oct. 31, 1956, by regular troops of the national Hungarian army, asked and received asylum in the United States legation in Budapest on Nov. 4, 1956. This action was motivated by the Russian repression of the Hungarian people's attempt at liberation from communist tyranny.

Stefan Cardinal Wyszyński, primate of Poland, recovered his liberty of action on Oct. 28, 1956, as a result of a change in the governmental regime. The cardinal's release was followed by important concessions. The Polish government had found it possible to give way on issues that it had fought bitterly during the previous ten years. Some Catholic weeklies were able to resume publication and the minister of education announced that an agreement on religious education had been reached with representatives of the hierarchy.

Ministering to an estimated Roman Catholic world population of 470,100,000 were 360,000 priests.

The Americas had 191,424,000 Catholics, Canada accounting for 6,260,327 and the United States (including Alaska and the Hawaiian Islands) for 33,574,017. This last figure represented an increase of 998,315 over the previous year. The new total represented a ten-year increase of 9,171,893, or 37.5%, over the 24,402,124 Catholics reported in 1946.

There were 26 archdioceses in the United States, with a Catholic population of 15,834,410. The total number of dioceses, including the vicariate of Alaska, was 106, with Catholic populations of 17,739,607.

The 26 archdioceses reported a growth of 554,147 and the 106 dioceses, 444,168. There were seven archdioceses with Catholic populations in excess of 1,000,000. They were Chicago, Ill., 1,899,357; Boston, Mass., 1,490,229; New York N.Y., 1,458,240; Philadelphia, Pa., 1,325,740; Newark, N.J., 1,179,469; Detroit, Mich., 1,125,000; and Los Angeles, Calif., 1,075,000.

Brooklyn, N.Y., with 1,497,598 continued as the largest diocese, while Pittsburgh, Pa., with 757,776, was the second largest. Buffalo, N.Y., was third with 725,201 and Cleveland, O., fourth with 659,275. While 10 sees reported no changes in their Catholic populations and 6 reflected slight decreases, the advances indicated in the remaining 116 showed substantial gains.

The Roman Catholic hierarchy of the United States had 214 members. There were 4 cardinals, 37 archbishops and 173 bishops, the largest number in the history of the Catholic Church in the United States.

An increase of 1,379 in the number of the clergy brought the total of ordained priests to 48,349, the largest ever recorded. There were 29,734 diocesan priests, an increase of 861, and 18,615 religious community priests, an increase of 518.

Professed religious personnel included 8,868 brothers and 159,545 sisters, representing respective increases of 116 brothers and 1,476 sisters.

The annual statement of the Catholic bishops of the United States, convened in Washington, D.C., on Nov. 17, 1956, echoed the thrice repeated pleas for peace made by Pope Pius XII in the course of ten days. The statement, entitled "Peace, Unity—the Hope of Mankind," was issued by the cardinals, archbishops and bishops at the conclusion of their annual meeting. They warned that the world was poised on the "brink of disaster." War in modern times, they said, would be a nightmare of horrors and would solve no problems. Accordingly, they said, every possible means must be tried to "avoid the final arbitrament of nuclear warfare." Against this grave warning, the bishops declared: "It has been the hope of humankind that a means adequate to the necessity might be found in the concert of United Nations. This is neither the time nor the place to review its history or to pass judgment on its achievements . . . The fact remains that it offers the only promise we have for sustained peace in our time; peace with any approximation of justice." The bishops called for a "crusade of prayer" so that "international sanity will triumph over war."

On Nov. 10, 1956, at Trinity college, Washington, D.C., Commissioner Thomas B. Murray, veteran member of the United States Atomic Energy commission, received the 1956 Peace award of the Catholic Association for International Peace.

A resolution, unanimously adopted at the closing session of the National Catholic Educational association in St. Louis, Mo., on April 6, 1956, called upon its members to provide leadership in bringing about integration of white and Negro pupils.

The year also was marked by a strengthening of the church's inner life. For the first time in its 2,000-year history, cardinals, bishops and priests from all the world met in Italy at Assisi, Sept. 18–21, 1956, to study the practical problems of liturgy. About 1,300 delegates, including 100 from the United States, attended the meeting. A recommendation from United States Catholic bishops for more extensive use of English in the revised Holy Week services was made in a report that had been prepared by Archbishop Edwin V. O'Hara, bishop of Kansas City-St. Joseph, Mo. Archbishop O'Hara, head of the United States delegation, died en route to the congress.

Priests and scholars of the old and new worlds met on Sept. 28,

1956, in the Benedictine abbey of St. Procopius, near Chicago, to seek an acceptable path by which millions of separated eastern Christians might re-enter the Roman Catholic Church. They assembled, with the endorsement of the Vatican, in the first unionistic congress to be held in the United States.

On Oct. 28, 1956, the Catholic Interracial council presented its annual James J. Hoey awards for interracial justice to Frank M. Folsom, president of the Radio Corporation of America, and Paul G. King, controller of South Carolina State college, Orangeburg. On Feb. 25, 1956, Francis Cardinal Spellman received the George Washington Carver Memorial institute's gold award for his "outstanding contribution to the betterment of race relations and human welfare." On March 11, 1956, the University of Notre Dame, Ind., awarded the school's Laetare medal to Gen. Alfred M. Gruenther. The medal is bestowed annually on an outstanding Catholic layman. General Gruenther, former supreme allied commander in Europe, was now head of the American Red Cross. He was the fourth military recipient so honoured since the Laetare medal was first presented in 1883.

(See also CHURCH MEMBERSHIP; MISSIONS, FOREIGN (RELIGIOUS); PIUS XII; RELIGIOUS EDUCATION; SOCIETIES AND ASSOCIATIONS, U.S.; VATICAN CITY STATE. (J. LAF.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Major Religions of the World* (Development and Rituals) (1954).

Rotary International: see SOCIETIES AND ASSOCIATIONS, U.S.

Rowing. Cornell retained the championship of the Intercollegiate Rowing association on Onondaga lake at Syracuse, N.Y., on June 16, 1956. The Ithacans won the 3-mi. race by $2\frac{1}{2}$ lengths in 16 min. 22.4 sec. Navy was second in the varsity contest. Washington won the junior varsity contest while Syracuse finished first in the freshman event of 2 mi. Cornell, with 16 points, gained the Ten Eyck trophy for team scoring for the third year in succession. Washington tallied 15 points.

A high light of the 1956 U.S. season was the return of Navy's unbeaten Olympic champions of 1952 to competition. The former Middies, who had compiled a record of 30 straight victories, appointed toward representing the United States in the 1956 Olympic games in Australia. After several preliminary regattas, the Admirals, as the squad was named, entered the Olympic trials on Onondaga lake, but had to be content with third place behind Yale and Cornell. In the final on July 1, Yale thrilled a crowd of 20,000 by defeating Cornell by $\frac{3}{4}$ length in a tense duel over the 2,000-m. course. Six other national crowns and places on the U.S. Olympic team were decided in the four-day regatta. Jack Kelly, Jr., of the Vesper Boat club of Philadelphia, Pa., took the national singles for the fourth straight time. In the pairs without coxswain Charley Logg, Jr., and Tom Price of the Rutgers Rowing club, victors in the 1952 Olympics, were beaten by the U.S. Navy pair of Duvall Hecht and Jim Fifer. Others to win titles and Olympic berths were Bernard Costello, Jr., and James Gardiner. Detroit Boat club, doubles; Dan Ayrault, Conn Findlay and coxswain Kurt Seiffert, Stanford Crew association, pairs with coxswain; John Welchli, Arthur McKinlay, John McKinlay, James McIntosh, Detroit Boat club, fours without coxswain; Douglas Turner, James Wynne, Jim McMullen, Ronald Cardwell, coxswain Ed Masterson, West Side Rowing club reserves, fours with coxswain.

Eastern Sprint Championships.—Cornell beat favoured Yale in the 2,000 m. race on May 12 as 15,000 watched from the banks of the Potomac at Washington, D.C. The victors' time was 6 min. 10 sec., fastest of the day. Yale, Penn, Princeton, Harvard and Navy followed, in that order. Cornell won the junior varsity event and Yale's cubs took the freshman contest. Cornell, with 18 points, won the Rowe cup as high scorer.

Blackwell Cup.—Yale led home Penn by four lengths at Philadelphia on April 28, with Columbia third. The Yale junior varsity and Penn's freshmen finished first in their respective divisions.

Goes Trophy.—Cornell won from Navy and Syracuse on Lake Cayuga at

Ithaca, N.Y., April 28. Cornell also won the junior varsity race and Navy took the freshman test, each at 2 mi.

Childs Cup.—Rowing into a stiff wind on the rough Harlem river in New York on April 20, Princeton beat Penn and Columbia. The Tigers also captured the freshman test and varsity, junior varsity and cub lightweight races. In the junior varsity event it was Penn, Princeton and Columbia.

Adams Cup.—Harvard triumphed in one of the year's feature races on the Severn river at Annapolis, Md., May 5, defeating Navy, Penn and Navy's Admirals over the choppy $1\frac{3}{4}$ mi. course. Harvard was timed at 9 min. 49 sec. Navy crews were victors in the junior varsity, freshman and three lightweight events.

Carnegie Cup.—Yale defeated Cornell and Princeton on the Housatonic river at Derby, Conn., May 5. Cornell's junior varsity eight won, as did the Princeton freshmen.

Geiger Cup.—Cornell's varsity lightweights led the Massachusetts Institute of Technology and Columbia on the Harlem river, May 5. It was the first regatta for the prize posted as a memorial to Ivan Geiger, former director of M.I.T. athletics.

Goldthwaite Cup.—Princeton's varsity 150-lb. crew raced over Carnegie lake in 6 min. 33.8 sec. on May 5 to defeat Harvard, Yale and Dartmouth and establish a Carnegie lake record for the Henley distance. Harvard's junior varsity and Princeton's cubs were winners.

Eastern 150-lb. Championships (Wright Cup).—Princeton's varsity broke its own Carnegie record for the Henley distance by winning in 6 min. 37 sec. on May 12. Cornell won the junior varsity race and Princeton took the freshman title.

Dad Vail Trophy.—La Salle college of Philadelphia, Pa., won the varsity race in this fourteenth annual regatta on the Schuylkill river, May 12. Rollins (Winter Park, Fla.) was the junior varsity victor.

Compton Cup.—Princeton's varsity recorded the best time ever made in this $1\frac{3}{4}$ mi. race on Carnegie lake, May 19, when it finished first in 8 min. 42.8 sec. The Tiger 150-lb. crew took the Wood-Hammond cup and Harvard won the freshman heavyweight test.

Yale-Harvard.—Yale swept the river at New London, Conn., June 16, leading their traditional rivals over a 4-mi. course by five lengths. The Elis were timed in 19 min. 26 sec. Yale's freshman and junior varsity crews also won impressively, giving the Blue its second straight sweep in the classic.

Washington-California.—The Huskies swept their annual races with California on May 19, winning varsity, junior varsity and freshman events.

Oxford-Cambridge.—A heavily-favoured Cambridge eight won by $1\frac{1}{4}$ lengths in the 102nd meeting of these old English rivals on March 24. Rowing on the Thames river over a 4-mi., 180-yd. course from Putney to Mortlake, the Light Blues were clocked in 18 min. 36 sec., the fastest time since Cambridge set the regatta record of 17 min. 50 sec. in 1948.

American R.A. Regatta.—Navy's Admirals defeated Penn by two lengths with Wisconsin third at Philadelphia, Pa., May 19. Winning time in the 2,000-m. sprint for the Stewards cup was 6 min. 40 sec. Jack Kelly, Jr., scored in the senior singles by 20 lengths. Stanford's Jim Fifer and Duvall Hecht took the doubles in pairs without coxswain.

United States Championships.—The Detroit (Mich.) B.C. won the Barnes trophy, symbolic of national rowing supremacy, by scoring 114 $\frac{3}{4}$ points on the Schuylkill July 4. The West Side R.C. of Buffalo, N.Y., was second with 90. Detroit led home West Side in both senior fours with and without coxswain. In the senior quad race the New York A.C. defeated the Vesper B.C., stroked by Jack Kelly, Jr., by 6 ft.

American Schoolboy Championships.—George Washington high school of Alexandria, Va., won the feature mile at Poughkeepsie, N.Y., May 26. Belleville (N.J.) high school's entry was second by $\frac{1}{2}$ length.

English Royal Henley.—The United States won the Thames Challenge cup for the third straight year when the Princeton 150-lb. crew beat the Royal Air Force eight by a length in 7 min. 10 sec. in the finals at Henley, Eng., on July 7. A French eight took the Grand Challenge cup when it beat Swedish Three Towns in 7 min. 6 sec. Teodor Kocherka of Poland won the Diamond Sculls trophy for the second year in a row. The Royal Engineers' four triumphed over the Brockville R.C. of Ontario, Can.

Royal Canadian Henley.—Taking four events on closing day, July 28, the West Side R.C. of Buffalo, N.Y., amassed 264 $\frac{1}{2}$ points for team honours at Port Dalhousie, Ont. The Hamilton Leanders were next with 193 points. The West Side senior eight scored a 1-ft. decision over the Detroit B.C. for the Hanlan memorial trophy. Pat Costello of Detroit, Mich., won the championship singles. John Pearce of Hamilton, Ont., was high school champion for the second straight year. Roberto Retolaza, Mexico City, took the junior singles title. The North American high school title was won by St. Joseph's, Buffalo, N.Y. St. Catharines no. 1 heavy crew rowed to a course record of 1 min. 18.4 sec. in beating five rivals in a $\frac{1}{4}$ -mi. dash for eights.

(See also OLYMPIC GAMES.)

(T. V. H.)

Ruanda-Urundi: see BELGIAN COLONIAL EMPIRE; TRUST TERRITORIES.

Natural Rubber.—World production of natural rubber for 1955 was estimated at 1,912,500 long tons. Production for the first six months of 1956 was estimated at 852,500 long tons, down 22,500 long tons compared with the same period in 1955. World production for 1956 was estimated by the International Rubber Study group meeting in Paris, Fr., in June 1956 at about 1,835,000 long tons.

The New York spot price for no. 1 ribbed smoked sheets fell steadily from 45 cents U.S. per pound in Jan. 1956 to 27 cents in May; it rose to 38 cents in August and stood at about 32 cents



ATOMIC BOUNCE demonstrated in silicone rubber. Ball on the left sticks to ordinary silicon gum when dropped from platform above; the ball on the right, however, bounces after landing on silicon gum which has been vulcanized by a two-second exposure to electron bombardment. The experiment was conducted in 1956 by the laboratories of the Westinghouse Electric corporation, Pittsburgh, Pa.

by the middle of October. The crisis over Egypt's action in nationalization of the Suez canal dominated all other influences on natural rubber prices in the July to September period, and rubber prices rose and fell as this situation seemed to worsen or abate. Prices for ASTM centrifuged latex concentrate paralleled ribbed sheet prices by a premium of about 8 cents U.S. per pound dry rubber basis in tank car quantities. Exports of natural rubber latex from producing countries for the first six-month period of 1956 were estimated at 73,000 long tons (dry rubber basis),

Table I.—Production of Natural Rubber in Principal Territories*

Last half 1955	(In long tons)							Total†
	Malaya‡	Indo-nesia‡	Ceylon	Vietnam and Cambodia	India, Sarawak and Other Asia	Africa	Brazil	
July	303,410	329,084	37,315	33,588	109,434	45,500	13,057	875,000
Aug.	335,718	404,702	56,515	59,069	115,280	52,500	8,226	1,037,500
Sept.	639,128	733,786	93,830	92,657	224,714	98,000	21,283	1,912,500
Year's total . .	305,876	294,645	39,143	34,939	110,814	54,350§	12,598§	852,500

*Includes latex (dry basis).

†Production divided as follows: First half 1955: Malaya, estates 54%, smallholders 46%; Indonesia, estates 39%, smallholders 61%. First half 1956: Malaya, estates 55%, smallholders 45%; Indonesia, estates 43%, smallholders 57%.

‡Estimated and includes other Latin-American countries and Oceania.

§Partly estimated.

Table II.—World Consumption of Natural Rubber*

Last half 1955	(In long tons)								World Total||
	U.S.A.	U.K.	France	Germany†	Europe‡	Canada	China§	Japan	
July	46,439	18,309	11,209	12,066	41,250	2,756	3,250	6,750	142,500
Aug.	48,586	16,010	6,283	13,071	34,500	2,869	1,750	7,520	132,500
Sept.	51,213	19,746	10,388	13,721	41,250	3,996	2,500	7,570	150,000
Oct.	55,236	22,884	11,642	12,624	57,000	3,865	3,750	7,680	167,500
Nov.	52,991	19,975	11,513	12,436	57,000	4,222	8,750	7,970	170,000
Dec.	48,590	22,226	11,571	10,305	55,750	3,740	2,500	7,580	162,500
Year's total. .	634,800	246,350	134,375	147,630	551,250	44,322	50,000	87,820	1,867,500

First half 1956

Jan.	53,751	21,698	11,839	12,561	50,000	3,292	9,750	7,250	165,000
Feb.	50,285	17,879	11,512	11,347	55,750	3,347	7,700	7,770	160,000
March.	50,040	15,993	12,283	11,253	59,500	3,296	2,100	8,200	157,500
April	47,446	18,374	11,296	10,633	50,500	3,561	10,500	8,280	157,500
May	48,342	14,502	11,144	10,358	60,500	3,628	3,650	...	155,000
June	42,845	16,146	...	...	...	3,619	1,850	...	155,000

*Includes latex (dry basis).

§Estimated net imports.

†Federal Republic.

‡Estimated for total continent.

||Estimated and includes all countries.

down about 4,500 long tons from the same 1955 period.

Replanting of old rubber-producing areas with modern high yielding clonal stock continued, especially in Malaya, both on estate and on native holdings, although the native group seemed somewhat more reluctant to cut out present stands of old trees during the recent period of high rubber prices.

Imports of natural rubber by commercial grades into the United States for 1955, according to a joint statement by the Rubber Trade Association of New York and the Rubber Manufacturers association, were as follows: all grades of ribbed smoked sheets, 63%; all grades of light crepe, 3.4%; estate brown crepe, 4.1%; all grades of thin brown crepe, 7.4%; amber blankets, 12.7%; smoked blankets, 3.9% and flat bark, 5.5%.

Synthetic Rubber.—World production of all types of synthetic rubber for 1955 excluding the U.S.S.R. and satellite countries (which reported no figures) was 1,085,266 long tons, of which the U.S. produced 970,468 long tons. This was roughly a 50% increase over 1954 output.

Table III.—World Consumption of Synthetic Rubber*

Last half 1955	(In long tons)							World Total§
	U.S.A.†	U.K.	France	Germany‡	Total Continent of Europe	Canada	Japan	
July	63,205	1,387	1,502	1,993	6,500	2,689	330	75,000
Aug.	75,782	1,528	871	2,453	6,500	2,685	350	87,500
Sept.	76,748	1,934	1,547	2,690	7,500	3,701	420	92,500
Oct.	80,816	2,600	1,988	2,765	8,000	3,551	470	97,500
Nov.	82,087	2,360	2,169	2,802	8,250	4,348	580	100,000
Dec.	76,424	2,687	2,459	2,132	7,750	3,978	570	95,000
Year's Total . .	894,899	20,454	19,419	25,393	78,750	40,206	4,170	1,062,500

*Includes latex (dry basis).

†Includes oil content of oil-extended types.

‡Federal Republic.

§Estimated and includes all countries.

World production of all types of synthetic rubber during the first six months of 1956 amounted to 614,312 long tons, up from the 506,090 long tons output during the same 1955 period. In June the International Rubber Study group estimated 1956 total world production would amount to 1,250,000 long tons. Principal world stocks of synthetic rubber at the end of June 1956 were estimated at 200,000 long tons. Production of synthetic rubber latices in the U.S. for 1955 totalled on a dry rubber basis: S-type 68,561 long tons; neoprene 10,432 long tons; N-type 10,798 long tons. The price structure remained much the same as in 1955: S-type 24 cents (freight allowed); N-type 58 cents (freight allowed); butyl 23 cents; neoprene 41 cents—all U.S. currency.

The government-owned synthetic rubber plant at Institute, W. Va., with a rated annual capacity of 122,000 long tons, was sold to Goodrich-Gulf Chemicals, Inc. for \$11,000,000. Plans for the expansion of synthetic rubber producing facilities were announced by all owners in the United States.

Standard Oil Co. (N.J.) licensed Société du Caoutchouc Butyl, a corporation formed by ten French companies, for the production of butyl rubber. The proposed plant was to be built at Port Jerome, near Le Havre, and when completed in 1958 would have a 20,000 long ton capacity. International Synthetic Rubber Co., Ltd., was formed in England in a joint

venture by Dunlop, Firestone, Goodyear and Michelin to build an S-type synthetic rubber plant of 50,000 long tons annual capacity near Southampton.

In the United States, military tires built entirely of Ameripol SN (Goodrich-Gulf Chemicals, Inc.) in one case and of Coral rubber (Firestone Tire and Rubber Co.) in the other case successfully passed the defense department's rigid tests. Invention of these two synthetic *cis*-1, 4-polyisoprene rubbers, so much like Hevea rubber in their uncured and in their vulcanized properties, were announced in 1954 and 1955, respectively. Phillips Chemical Co. announced the preparation of both a virtually all *cis*-1, 4- and a *trans*-1, 4-polybutadiene. The *cis*-form is a rubber said to have unusually high resilience when vulcanized and to exhibit remarkable low temperature resistance, its brittle point being -160° F.

A freeze-agglomeration process for producing high solids, low viscosity latex, starting with ordinary small particle size S-type latex, was announced by the B. F. Goodrich Co. The method resulted in lower manufacturing cost of S-type high solids latex and a higher production capacity for each polymerization reactor than current methods offered.

Reclaimed Rubber.—World production of reclaimed rubber in 1955 was 421,954 long tons. For the first six months of 1956 world production was estimated at 205,240 long tons as compared with 211,518 long tons for the same period in 1955. U.S. consumption through June 1956 was 145,182 long tons, compared with 160,711 long tons for the same period in 1955.

Table IV.—World Consumption of Reclaimed Rubber*

	(In long tons)							
Last half 1955	U.S.A.	U.K.	France	Germany	Australia	Canada	Brazil	Total
July . . .	22,425	2,175	1,659	2,697	780	1,046	520	31,302
Aug. . . .	25,633	2,073	1,016	2,752	780	914	530	33,698
Sept. . . .	26,179	2,815	1,807	3,011	781	1,356	365	36,314
Oct.	26,425	3,306	1,960	2,822	725	1,242	573	37,053
Nov.	27,052	3,237	2,035	2,961	725	1,506	518	38,034
Dec.	24,356	2,991	2,069	2,478	725	1,346	512	34,477
Year's total . .	312,781	32,065	20,889	32,940	8,484	15,029	6,208	428,396
First half 1956								
Jan.	25,827	3,125	2,042	3,258	725	1,338	428	36,743
Feb.	25,571	2,691	1,981	3,091	725	1,393	491	35,943
March	26,176	2,517	2,112	3,053	725	1,478	502	36,563
April	23,999	2,492	2,086	2,917	...	1,575	...	...
May	23,560	2,274	1,981	2,802	...	1,620	...	...
June	20,049	2,355	...	...	...	...	...	...

*All figures include both natural and synthetic reclaimed rubbers.

Rubber Manufacturing.—World consumption of new rubber in 1955 was at the all-time high record of 2,930,000 long tons divided 64% natural rubber, 36% synthetic rubber. U.S. consumption of new rubber in 1955 was 1,529,699 long tons divided 41½% natural rubber, 58½% synthetic rubber. World consumption for the first six months of 1956 was estimated at 1,520,000 long tons divided 62½% natural rubber, 37½% synthetic rubber. U.S. consumption for the first six months of 1956 was 741,511 long tons divided 39½% natural rubber, 60½% synthetic rubber. The continued shift toward synthetic rubber resulted primarily from the higher price of the natural commodity.

Total shipments of pneumatic tire casings in the U.S. in 1955 (excluding aeroplane and industrial pneumatics) were 112,221,004 units (passenger 93,729,709; truck and bus 14,769,326; farm tractor and implement 3,722,014). Shipments for the first seven months of 1956 totalled 62,966,493 units (passenger 52,298,612; truck and bus 8,588,858; farm tractor and implement 2,079,023) compared with shipments during the same 1955 period of 69,354,653 units (passenger 58,304,903; truck and bus 8,603,440; farm tractor and implement 2,446,310). Tire inventories in the hands of manufacturers at the end of July 1956 totalled 18,094,224 units compared with 15,337,552 units at the end of July 1955. (E. B. NN.)

Ruiz Cortines, Adolfo (1891—), president of Mexico, was born on Dec. 30 in the state of Veracruz. He first rose to national political prominence when he became governor of Veracruz in 1944. When Miguel Alemán was elected president of Mexico in 1946, Ruiz Cortines became one of his most influential political aides and was later named minister of the interior. On Oct. 13, 1951, he was nominated by the Partido Revolucionario Institucional (P.R.I.) to succeed Alemán as president, and the following July he was elected by a huge majority. He took office on Dec. 1, 1952, for a six-year term. A determined advocate of economy and honesty in government, Ruiz Cortines refused to accept the usual president's special expense account and in 1953 exposed considerable graft among high officials of the Alemán administration, seizing their property and cancelling their government contracts.

In Feb. 1955 he conferred with U.S. Vice-Pres. Richard M. Nixon during the latter's good-will visit to Mexico. In late March 1956 he met with Pres. Dwight D. Eisenhower and Canadian Prime Minister Louis S. St. Laurent at White Sulphur Springs, W.Va., for a "good neighbour" conference.

Rulers: see PRESIDENTS, SOVEREIGNS AND RULERS.

Rumania. This people's republic of southeastern Europe is bounded north and northeast by the U.S.S.R., east by the Black sea, south by Bulgaria and west by Yugoslavia and Hungary. Area: 91,654 sq.mi. Pop.: (1948 census) 15,872,624; (1956 est.) 17,489,794. Language (1948 census): Rumanian 85.7%; Hungarian 9.4%; German 2.2%; Yiddish 0.9%; other 1.8%. Religion (1947 est.): Orthodox 81%; Greek Catholic 9%; Roman Catholic 7%; other 3%. Chief towns (pop., 1948 census, 1956 est. in parentheses): Bucharest (Bucuresti, cap.) 1,041,807 (1,236,900); Cluj 117,915 (154,800); Timisoara 111,987 (142,300); Iasi (Jassy) 94,075 (109,000); Brasov 82,984 (108,000); Ploesti 95,632 (105,000); Braila 95,514 (104,000); Galati 80,411 (103,000); Oradea 82,282 (93,000). First secretary of the Rumanian Workers' (Communist) party in 1956, Gheorghe Gheorghiu-Dej; chairman of the presidium of the grand national assembly, Petru Groza; chairman of the council of ministers, Chivu Stoica.

History.—The repercussions of the 20th congress of the Communist party of the Soviet Union in Feb. 1956 were felt in Rumania as in other countries of eastern Europe. The repudiation of Stalinism and the recognition extended to national forms of Socialism opened the way for the reconciliation of Rumania and Yugoslavia after eight years of political segregation dictated by Yugoslavia's expulsion from the Cominform. Following Marshal Tito's visit to the U.S.S.R. in June, official Rumanian-Yugoslav talks were held at Bucharest, in which the Yugoslav president himself participated. These resulted in trade and travel agreements, trade union and cultural exchanges and practical measures for industrial collaboration, of which the most notable was the projected joint construction of a hydroelectric power plant near the Iron Gates on the Danube. In October a Rumanian party and government delegation headed by Gheorghiu-Dej and Chivu Stoica carried on further discussions with Tito in Belgrade on economic and technical co-operation, and on furthering closer relations between the Rumanian Workers' (Communist) party and the Yugoslav League of Communists.

In its relations with the non-Communist world, the Rumanian government acted strictly within the limitations of the principle of peaceful co-existence commended by the 20th congress of the Communist party of the Soviet Union, which permitted commercial, and to some extent cultural, contacts with the west. After the dissolution of the Cominform in April 1956, these contacts increased. In May Rumania joined the International Labour

organization and took part in the work of the International Labour office at Geneva, Switz. In July the government initiated negotiations with the United States to improve relations and solve outstanding disputes. In August Rumania obtained membership in UNESCO and resumed diplomatic relations with Greece. Foreign trade with the west also increased appreciably during the year.

The year 1956 was the first of the second five-year plan, and the government promulgated measures to stimulate labour productivity in agriculture and industry. Between January and September the number of collective farms and agricultural associations increased from 6,325 to about 10,000. In July the government revised the regulations governing collective farms and permitted certain classes of rich peasants, hitherto debarred from entering these farms, to join them. The government also announced in August that the mechanization of agriculture had progressed so far that there was now a tractor to every 320 ha. of cultivated land, and that Rumania had in operation more than 30,000 tractors, 1,500 self-propelled combine harvesters and 10,000 threshing machines. At the same time, it was recognized that 75% of agricultural, vegetable and animal production was still derived from individual farms, and that it was incumbent upon the government to encourage the independent peasantry to produce more food by offering material incentives in the form of reasonable prices and enough consumer goods.

There was no deviation from the party line of conceding priority to heavy industry, and the budget for 1956 made provision for industrial development schemes representing 52% of the total volume of state capital projects, which was 36.5% higher than 1955.

On Oct. 22, in an agreement signed in Bucharest, the Soviet government transferred to Rumania its 50% ownership of the joint stock company Sovromcuartit, which monopolized the mining of Rumania's uranium deposits. Two joint stock companies continued to function at the end of 1956, namely, Sovromasigurare (insurance) and Sovromfilm. (G. D. ON.)

Education.—Schools (1955): primary about 17,000, pupils 2,400,000; secondary 500, pupils 150,000; vocational 400, pupils 170,000; institutions of higher education 50 (including 4 universities), students 75,000. National minorities schools: primary and secondary, 3,200 in which tuition is given in 15 different languages; there is also a Hungarian university.

Finance.—Monetary unit: leu (pl. lei) with official exchange rate, high and fictitious, of 6 lei to the U.S. dollar. Budget (1956 est.): revenue 45,430,600,000 lei; expenditure 44,430,600,000 lei, including 26,144,100,000 lei invested in the national economy.

Foreign Trade.—Trade turnover with all countries (1954 est.) U.S. \$670,000,000, including \$560,000,000 with the countries of the Communist group.

Transport and Communications.—Highways (1955) 61,794 mi. Licensed motor vehicles (Dec. 1955): cars 6,000; commercial 17,000. Railways (1949) 7,363 mi. Telephones (1954 est.) 140,000. Radio receiving sets (1949) 226,000.

Agriculture.—No reliable data published since 1949. Main crops (metric tons, latest estimates): maize (1948) 5,279,000; wheat (1948) 2,600,000; barley (1948) 360,000; oats (1946) 280,000; rye (1947) 66,000; potatoes (1949) 1,090,000; sugar beets (1954) 1,275,000. Wine production (1953) 4,100,000 hl. Livestock (1953 est.): cattle 4,581,000; pigs 3,634,000; sheep and goats 11,482,000; horses 1,073,000.

Industry.—Production (metric tons if not otherwise stated, 1955): coal 400,000; lignite 6,200,000; crude petroleum 10,575,000; methane gas 3,900,000,000 cu.m.; electricity 4,300,000,000 kw.hr.; pig iron 575,000; steel 765,000; cement 2,000,000; sulphuric acid 92,000; tractors 5,300 units; cotton fabrics 245,000,000 cu.m.; sugar 135,000.

Running: see TRACK AND FIELD SPORTS.

Rural Electrification Administration. The Rural Electrification Administration marked its 21st year in 1956 with expanded programs in financing rural electrification and telephone facilities.

At the end of 1935, only one farm in 10 had central station electric power; by the end of June 1955, power lines carried electricity to 93.4% of the farms. According to the U.S. bureau of the census, farms with telephones increased from 38.2% in 1950

to 48.8% in 1954.

In rural electrification, REA loaned \$189,804,800 in the year ended June 30, 1956. This brought the total of such loans since the agency was established in 1935 to \$3,238,250,759. The number of consumers on REA-financed power lines was about 4,300,000, including more than half of the 4,500,000 electrified farms in the United States.

One new generation and transmission co-operative and two new electric distribution co-operatives received loans during the fiscal year. This brought the number of active REA electrification borrowers to 996, including 934 co-operatives, 41 public power districts, 17 other public bodies and 4 electric companies. Also, REA approved its first loan to finance the conventional generating facilities of a nuclear reactor, to the Rural Cooperative Power Association of Elk River, Minn.

One co-operative paid off its government loan during 1956 with earnings from service, bringing to four the number of co-operatives which had repaid in full their REA loans.

Electricity used on REA-financed lines increased 17% during the 1956 fiscal year, and REA borrowers distributed almost three times the amount of power they did in 1950. Energy sales amounted to about \$1,200,000 per day. Farmers on REA-financed lines used an average of 2,957 kw.hr. in 1955, as compared with 1,752 kw.hr. in 1950.

In the rural telephone program, REA loans in the fiscal year 1956 totalled \$80,980,000. This brought the total of such loans, since the program was established by congress in 1949, to \$312,391,542 to 270 independent telephone companies and 196 co-operatives. When the facilities contemplated in these loans were completed, REA telephone borrowers would be providing modern telephone service to more than 695,000 farm families and other rural subscribers in 43 states and Alaska. As of June 30, 1956, 227 REA-financed telephone organizations had placed in service 846 new dial exchanges.

In both the electrification and telephone programs, REA loans bore 2% interest and had to be repaid over a maximum period of 35 years. As of June 30, 1956, electric borrowers had paid the government approximately \$246,000,000 in interest and had repaid \$493,000,000 of principal on their REA loans.

For the 1957 fiscal year congress authorized \$214,000,000 in new electrification loan funds, including reserve funds of \$25,000,000. Also available for lending was \$24,678,000 carried over from 1956. New telephone loan funds authorized by congress for fiscal 1957 amounted to \$100,000,000, including \$20,000,000 in reserve funds. Funds carried over from fiscal 1956, amounting to \$30,345,000, also were available for telephone loans. (See also CO-OPERATIVES.)

(D. A. HL.)

Rural Rehabilitation Loans: see FARMERS HOME ADMINISTRATION.

Russell Sage Foundation: see SOCIETIES AND ASSOCIATIONS, U.S.

Russia: see UNION OF SOVIET SOCIALIST REPUBLICS.

Russian Literature. Soviet writers were severely criticized at the 20th congress of the Communist party of the U.S.S.R., which was held in Feb. 1956 in Moscow. Literature was again not close enough to life and did not satisfy the growing spiritual needs of the Russian people, declared N. S. Khrushchev. Aleksey Surkov, the first secretary of the Writers' union, defended his colleagues, while admitting the justice of many criticisms. The most noteworthy event of the congress was the violent reproach of Surkov by the novelist Mikhail Sholokhov for having evaluated the standard of literature by the quantity of books which had appeared. Sholokhov complained that writers were living too far away from the people,

in a monastic atmosphere. He attacked the former general secretary of the Writers' union Aleksandr Fadeyev, deploring that Fadeyev had lost the 15 best years of his intellectual life without having succeeded in properly directing the Writers' union.

Literary circles were as much troubled as political circles by the campaign against Stalinism. Disorder reigned among the novelists, dramatists and poets who saw works which had won the "Stalin prize" condemned as harmful and as not conforming to "socialist realism." The *Literaturnaya Gazeta* (May 8) announced that since the 20th congress many writers knew no more than what the Communist party demanded from them. It revealed that at certain literary reunions they even dethroned the great poet Vladimir Mayakovsky and claimed the rehabilitation of the novelist Mikhail Zoshchenko, condemned by Andrei Zhdanov.

In reality the Communist party, faithful to Marxism-Leninism, did not renounce its control of intellectual life but became a little more liberal. Many writers who had disappeared during the great scourge of the 1930s were discretely rehabilitated: Isaak Babel, Vladimir Kirshon, Perets Markich, Lev Kvitko and Bruno Jasienski—nearly all of whom had been condemned as Trotskyists. Homage was rendered to the greatest of the Russian *émigré* writers, the Nobel prize winner Ivan Bunin, and a recent edition of his works, comprising novels written after his departure from Russia in 1918, was published in Moscow. Similarly, the editing was commissioned of works by Ivan Kataev, former chief of the literary group "Pereval," who had been missing since 1937, having been condemned as an "enemy of the people."

In 1956 many Soviet writers entered into contact with their English, French and U.S. colleagues and State Editions had undertaken the translation of works of foreign writers, such as Ernest Hemingway, Sinclair Lewis and François Mauriac, who were neither Communists nor "progressives." The review *Inostrannaya Literatura* ("Foreign Literature") helped in this campaign of reconciliation with the western writers.

Another sign of the new liberalism was the impressive celebration of the 75th anniversary of the death of Fyodor Dostoevski. Considered for a long time as a retrograde and antirevolutionary mainly because of his novel *The Possessed*, Dostoevski was covered with praise at the commemorative sitting on Feb. 9. His biographer V. V. Ermilov praised the expression in his novels of the "suffering of men and women humiliated and offended by an exploiting society." Many plays and films based on his novels were shown during the year.

Since 1953 the "Stalin prize" had no longer been awarded to literary men. On Sept. 6 the re-establishment was announced of the "Lenin prizes," which had been awarded between 1925 and 1935. From a total of 50 prizes 8 would be reserved for writers and artists and awarded to the winners each year on the anniversary of the birth of Lenin. (A. PR.)

Rye. The indicated rye crop in the United States for 1956 was 21,961,000 bu., about one-fourth smaller than the 29,678,000 bu. 1955 crop but 2% above average. Only 1,724,000 ac. were harvested, 82.4% of the 2,092,000 ac. harvested in 1955, but approximating the average for 1945-54. The average yield was 12.7 bu. per acre, as compared with 14.2 bu. in 1955 and an average of 12.5 bu. per acre for the previous decade. The leading producing state was North Dakota with 4,560,000 bu. (9,360,000 bu. in 1955), followed by South Dakota with 1,986,000 bu. (4,088,000 bu. in 1955), Nebraska with 1,674,000 bu., Indiana with 1,452,000 bu. and Minnesota with 1,410,000 bu. Carry-over stocks were 16,300,000 bu. (about the same as in 1955), of which the Commodity Credit corporation owned 10,200,000 bu., giving a domestic supply for 1956-57 of 38,300,000 bu., as compared

with 46,100,000 bu. in 1955-56.

Exports of 7,000,000 bu. in 1955-56 were the largest since 1928, with prospects of a still larger export in 1956-57. Imports from Canada in 1955-56 and 1956-57 were limited under a quota to 3,400,000 bu. per year as compared with 13,400,000 bu. imported in 1954-55.

The price in October was \$1.21 per bushel to producers, as compared with 93 cents a year earlier. The support price to producers was \$1.27 per bushel as compared with \$1.18 for the 1955 crop, of which crop farmers placed a record 12,800,000 bu. under the support program.

Rye Production of the Principle Producing Countries

Country	(In thousands of bushels)		Average 1945-49	Average 1935-39
	Preliminary 1956	1955		
U.S.S.R.	147,040	137,800	895,000	885,000
Western Germany	27,050	25,590	98,000	119,000
Turkey	19,680	19,320	13,679	14,301
Spain	19,650	18,300	17,117	18,363
Netherlands	18,000	17,300	15,520	20,394
France	16,450	16,380	20,618	29,993
Austria	390,000	422,000	12,260	20,611
Other Europe*	21,961	22,678	337,000	481,000
United States	21,961	22,678	22,336	44,917
Canada	8,600	14,754	13,182	9,191
Argentina	27,560	25,750	14,944	9,771

*Comprises Albania, Bulgaria, Czechoslovakia, eastern Germany, Hungary, Poland and Rumania.

World rye production estimated at 1,365,000,000 bu. in 1956 was the smallest since 1945 as compared with 1,485,000,000 bu. in 1955, an early postwar average (1945-49) of 1,530,000,000 bu. and a prewar average of 1,732,000,000 bu. (J. K. R.)

Saar. A German state (*Land*) united with France by monetary union. Area: 991 sq.mi. Pop.: (1951 census) 955,413; (1955 est.) 996,000. Language: German. Religion: Roman Catholic 73.4%; Protestant 25.3%. Capital: Saarbrücken, pop. (1951 census) 111,450, (1953 est.) 116,395. Prime minister in 1956, Hubert Ney.

History.—On Jan. 2, 1956, after the election to the Saar *landtag* on Dec. 18, 1955, Hubert Ney, leader of the local Christian Democratic union (C.D.U.), was elected premier while Heinrich Schneider, the leader of the nationalist Democratic party, was elected president of the *landtag*. A cabinet was then formed from the parties of the Heimatbund with three other members of the C.D.U., two followers of Schneider, two Social Democrats and the nonparty expert Adolf Blind as minister of finance. In April a dispute over the election was decided in favour of the Democratic party, which was in consequence represented by 13 members in the *landtag* instead of 12, while J. Hoffmann's Christian People's party (C.V.P.) fell from 13 to 12 seats. On March 18 the Socialist party, which had favoured autonomy, was dissolved and most of its members joined the pro-German Social Democrats of the Heimatbund. On May 13,



SAAR AND NEIGHBOURING NATIONS. In June 1956 France and Germany agreed to honour a Saar plebiscite overwhelmingly in favour of union with Germany

when local elections were held, the Social Democrats therefore increased their representation considerably. On this occasion both C.D.U. and C.V.P., although attempts to bring about their fusion had failed by the middle of April, gained a few votes each, while the strength of the Democratic party slightly diminished. In July the Saar C.D.U. was absorbed into the western German C.D.U.; the C.V.P., however, joined the western German Centre (Zentrum), a Roman Catholic party, smaller and rather more to the left. Schneider, who wished to preserve the alliance of the Saar parties in the Heimatbund, where his influence was paramount, disliked these fusions, and on Sept. 16 his party decided that it would join no party in the German Federal Republic for the time.

Through most of the year Franco-German negotiations were pursued with regard to the future status of the Saar. At Luxembourg on June 5 agreement was reached on essentials: the Saar was to be politically reunited with Germany on Jan. 1, 1957, and economically united three years later; in return France would receive 90,000,000 tons of coal within the next 25 years, and the Germans agreed in principle to the canalization of the Moselle, promising to contribute nearly one-third of the cost. The details were not worked out until a series of agreements, which were signed on Oct. 27, had been made. According to these, the French were to mine 66,000,000 tons of coal from the Warndt mines through the shafts in Lorraine; the remaining 24,000,000 tons from elsewhere in the Saar or Germany would be sold to France by Germany at cost price. The ratio of Franco-Saar commercial exchanges during 1955 was to be preserved duty-free until further notice; arrangements were also made for badly needed capital equipment to be imported from Germany to the Saar, immediately, without payment of duties. The Germans accepted the existing rate of exchange for the currency changeover on Jan. 1, 1960. It had already been settled that from Jan. 1, 1957, ten Saarlanders would attend the *bundestag* and three the *bundesrat* as observers; at the western German election in 1957 the Saarlanders would participate as full German citizens. In June the German social insurance system was adopted in the Saar, and on Aug. 1 German law became valid there. (E. Wl.)

Safety: see ACCIDENTS.

Sailing: see YACHTING.

St. Christopher: see LEEWARD ISLANDS.

St. Croix: see VIRGIN ISLANDS.

St. Helena. St. Helena is a British colony in the south Atlantic, about 1,200 mi. from the southwest coast of Africa, with dependencies of Ascension (34 sq.mi.; pop. [1954 est.] 173) and the Tristan da Cunha island group (total area 38 sq.mi.; only Edinburgh settlement on Tristan da Cunha [16 sq.mi.] is inhabited; pop. [Dec. 1954 est.] 294). Colony area 47 sq.mi.; pop. (1955 est.) 5,000 (mainly of mixed European and African descent). Language: English. Religion: Christian (90% Anglican). Capital: Jamestown (pop. about 1,600). Governor in 1956, Sir James Harford; administrator, Tristan, P. R. Forsyth Thompson.

History.—The possibilities of starting a fishing and canning industry were actively investigated during 1956. Monthly calls by Union Castle ships were reintroduced. A new hospital and a new parish home, built from funds provided under the United Kingdom Colonial Development and Welfare act, were opened, and a new constitution, involving the enlargement of the executive and advisory councils, was introduced. Toward the end of 1956, which was generally a year of depressed economic conditions, unemployment was somewhat relieved by a number of St. Helenians being employed by U.S. authorities on Ascension Island. (K. B. S.)

Education.—Schools (1953): primary 6, pupils 697, teachers 12; all-range 3, pupils 261, teachers 5; secondary (including 2 middle schools) 3, pupils 316, teachers 16. Pupil-teachers: primary 18, all-range 10, secondary 4.
Finance and Trade.—Currency: sterling. Budget (1955): revenue £162,597; expenditure £170,297. Foreign trade (1955): imports £206,551; exports £56,177. Livestock (1955): cattle 724; sheep 1,218; goats 1,861; pigs 266; poultry 9,200; donkeys 1,161; horses 29. Production (1953): hemp 975 long tons.

St. John: see VIRGIN ISLANDS.

St. Kitts-Nevis: see LEEWARD ISLANDS.

St. Laurent, Louis Stephen (1882–), Canadian prime minister, was born on Feb. 1 at Compton, Que., and educated at St. Charles college, Sherbrooke, and Laval university, Quebec, Que. He entered federal politics on Dec. 10, 1941, and was in turn minister of justice and attorney general, later secretary of state for external affairs. On Nov. 15, 1948, he became the 17th prime minister of Canada. As Liberal member for Quebec East, he was elected to parliament in 1942, 1945, 1949 and 1953.

During 1956 St. Laurent led the government in the third session of the 22nd parliament which began on Jan. 10 and concluded on Aug. 14—the second longest session in the history of Canada, with 152 sitting days.

During this session the house approved measures to begin construction on an all-Canadian national gas pipeline to bring Alberta gas to eastern markets; to authorize the government to enter into tax rental agreements with the provinces when the existing agreements expire in 1957; and to permit the government to enter into agreements with the provincial governments for sharing costs of assistance to unemployed persons.

In March St. Laurent travelled to White Sulphur Springs, W.Va., for meetings with Pres. Dwight D. Eisenhower and Pres. Adolfo Ruiz Cortines of Mexico. In late June and early July he attended a meeting of commonwealth prime ministers in London, Eng.

During 1956 St. Laurent welcomed to Canada Pres. and Mme. Giovanni Gronchi of Italy; Pres. Achmed Sukarno of the republic of Indonesia; Sir Anthony Eden, prime minister of the United Kingdom; S. G. Holland, prime minister of New Zealand; R. G. Menzies, prime minister of Australia; and other distinguished visitors. (H. E. K.)

St. Lawrence Seaway: see CANALS AND INLAND WATERWAYS.

St. Louis. St. Louis, Mo., covers an area of 62.4 sq.mi. of land (pop., 1950 census, 856,796) on the west bank of the Mississippi river 15 mi. below its confluence with the Missouri. According to the 1950 census the St. Louis metropolitan area had a total population of 1,681,281 (1956 est., 1,815,500). Mayor of St. Louis in 1956 was Raymond R. Tucker, a Democrat, who was elected in 1952.

The present city charter was written in 1914. After months of debate, the board of aldermen authorized an election for a board of freeholders to write a new charter on May 8, 1956. The 13 freeholders, supported by a city committee, the *Globe-Democrat* and *Post-Dispatch*, the city's metropolitan newspapers, were elected by a majority of more than 21,000 over a slate supported by the Democratic, Republican and labour organizations.

Late in the year the freeholders were drafting a new charter which was to be submitted to the electorate in early 1957.

Congress passed an appropriation of \$2,600,000 for construction of the Jefferson National Expansion memorial on the river front. The city portion of this project had been authorized more than 21 years previously. A historic shrine was to be constructed which would beautify the river front and be the beginning of

rehabilitation of the oldest area in the city.

On March 10, 1956, a large municipal airport building, built at a cost of \$5,880,000, was opened at Lambert field in St. Louis.

Inadequate air-lines service joining St. Louis with the other major cities of the country was the subject of a major campaign by the *Globe-Democrat*. As a result, with the spirited support of civic leaders, Mayor Tucker and the St. Louis delegation in congress, hearings were held by the Civil Aeronautics board in Washington, D.C. A number of new and enlarged services had already been planned, recommended, authorized or established.

During 1956 there was only one major strike in St. Louis, that of the Oil, Chemical, and Atomic Workers' union against the Laclede Gas company. Gov. Phil M. Donnelly seized the company under terms of the state King-Thompson law forbidding strikes on public utilities. After 11 days the workers returned to their jobs with suits totalling more than \$230,000 in fines pending against them in the courts.

(R. H. A.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Missouri* (1955).

St. Lucia: see WINDWARD ISLANDS.

St. Pierre and Miquelon. This French overseas territory consists of eight small islands off the south coast of Newfoundland. Area: 93 sq.mi. Pop. (1951 census) 4,606; (1955 est.) 5,000. Language: French. Religion: Roman Catholic. Chief town: Saint-Pierre, pop. (1951 census) 3,997. Administrator in 1956, Pierre Sicaud.

History.—At the elections to the French national assembly held on Jan. 2, Alain Savary (Socialist) retained his seat.

(Hu. DE.)

Education.—(1955) Schools: state 8, pupils 530, teachers 32; private 9, pupils 771, teachers 35.

Foreign Trade.—(1955) Monetary unit: 1 fr. C. F. A. (Colonies Françaises d'Afrique)=2 metropolitan French francs. Imports 585,000,000 fr. C. F. A., including 310,000,000 fr. C. F. A. from Canada, 229,000,000 fr. C. F. A. from the U.S. Exports 126,000,000 fr. C. F. A., including 8,000,000 fr. C. F. A. to France. Principal export: fish.

St. Thomas: see VIRGIN ISLANDS.

St. Vincent: see WINDWARD ISLANDS.

Salt. Table I, giving total world output of salt, lists only those countries producing 500,000 tons or more yearly. More than 85 countries supply the reported world total.

Table I.—*World Production of Salt*
(In thousands of short tons)

	1949	1950	1951	1952	1953	1954	1955
Argentina	775	330	463	540	499	550?	552
Brazil	888	875	1,372	860	839	744	1,056
Canada	751	859	964	973	960	963	1,254
China	2,200?	3,300?	5,000?	5,450	5,500?	6,100?	6,600?
Egypt	386	594	757	549	419	497	443
France	2,772	3,203	3,323	3,154	3,294	3,212	2,925
Germany (west)	2,066	2,824	3,134	2,980	3,851	3,699	3,730
Great Britain	4,192	4,738	5,234	4,414	4,544	4,951	5,233
India	2,229	2,935	3,063	3,165	3,545	3,043	3,335
Italy	1,407	1,454	1,666	1,551	1,546	1,729	1,669
Japan	436	461	474	478	508	468	619
Netherlands	369	451	535	457	504	564	645
Poland	922	1,100?	1,100?	1,100?	1,100?	1,100?	1,100?
Spain	921	1,334	1,373	1,116	1,508	1,405	1,237
U.S.S.R.	5,500?	5,500?	6,100?	6,600?	6,800?	7,200?	7,200?
United States	15,572	16,630	20,207	19,545	20,789	20,669	22,704?
Other	5,614	6,412	6,835	6,868	6,894	7,606	7,698
Total	47,000	53,000	61,600	59,800	63,100	64,500	68,000?

United States.—About 35% of the world output of salt is produced and consumed in the U.S. Deposits of salt are widespread. Commercial production by the various types follows: rock salt is chiefly from the eastern half of the country, with some from Louisiana, Kansas and Texas. Evaporated salt is derived from "artificial" brine brought up from the deposits mainly in the middle states. Solar salt is produced in the west, predominantly from sea water in California and from the Great Salt lake in Utah. About 70% of the yearly total is used in making chemicals

and 30% is used for livestock, meat packing, table and other

Table II.—*Salt Industry in the United States*
(In thousands of short tons)

	1951	1952	1953	1954	1955
Production, total	20,207	19,545	20,789	20,669	22,704
Evaporated (dry salt)	2,655	3,642	3,702	3,731	3,987
Rock (dry salt)	4,662	4,568	4,479	4,825	5,293
In brine (salt content)	11,890	11,336	12,608	12,113	13,424
Imports for consumption	4	7	137	161	186
Exports	439	350	250	381	407
Apparent consumption	19,772	19,202	20,676	20,445	22,483

household uses, dust and ice control, water treatment, canning and food processing and many smaller uses.

(F. E. H.; B. B. M.)

Salvador, El. A republic on the Pacific coast of Central America, the smallest but most densely populated country on the isthmus, El Salvador has an area of 8,260 sq.mi. (of which 8,165 sq.mi. are land) and a population (1950 census) of 1,855,917 (1955 official est., 2,231,000). The capital is San Salvador, pop. (1950 census) 161,951; (1953 est.) 180,713. The 1950 populations of other principal cities are (1953 estimates in parentheses): Ahuachapán 10,294 (11,092), Chalchuapa 9,855 (10,557), Cojutepeque 10,015 (10,942), Mejicanos 9,389 (10,402), San Miguel 26,702 (28,730), Santa Ana 51,702 (56,952), Nueva San Salvador or Santa Tecla 18,313 (20,246), San Vicente 10,950 (11,795), Sonsonate 17,949 (19,070), Usulután 9,481 (10,512), Villa Delgado 13,331 (14,695) and Zacatecoluca 9,190 (10,023). Language: Spanish. Religion: predominantly Roman Catholic. Presidents in 1956: Lieut. Col. Oscar Osorio; from Sept. 14, Lieut. Col. José María Lemus.

History.—On March 4, 1956, Lieut. Col. José María Lemus was elected president of El Salvador by default. Humberto Costa was chosen as vice-president. During the course of the campaign, it had become evident that the official backing of Colonel Lemus by incumbent Pres. Oscar Osorio and the Partido Revolucionario de Unificación Democrática would be decisive. One by one, the opposing candidates were disqualified or withdrew. Col. Alberto Funes, candidate of the Partido Institucional Demócrata, was eliminated when the central election board applied the law which excluded any candidate against whom there was a pending legal action. Maj. Alvaro Díaz was dropped because his Partido Demócrata Nacionalista was not properly registered. On a similar technicality, the election board ruled out Roberto Canessa, former foreign minister and leader of the Partido Acción Nacional. Besides Colonel Lemus, only Col. Rafael Carranza Amaya of the Partido Auténtico Constitucional and Enrique Magaña Menéndez of the Partido Acción Renovadora were left in the race. Coalitions were formed to pool the strength of the opposition parties, but on Feb. 29 all five opposition candidates withdrew, charging government oppression and fraud in favour of Lemus. They ordered their supporters not to vote.

In the absence of opposition, Lemus won the March 4 election by a vote of approximately 678,000 to 45,000. Congressional elections were held on May 14, followed by municipal elections on July 1. In both, the government-supported candidates were virtually unopposed.

The president-elect attended a meeting with President Osorio of El Salvador and Pres. Julio Lozano Díaz of Honduras in June to consider a new commercial treaty with Honduras. In July Lemus was the official representative of El Salvador at the conference of American presidents in Panamá. The presidential inauguration took place on Sept. 14. In October representatives of Guatemala, El Salvador and Costa Rica met in San Salvador to plan an industrial and commercial census of Central America to be started in 1957.

Since the law to promote the development of processing industries went into effect in 1952, private industry had invested

about \$21,000,000 in factories which produce cement, sugar, beer, textiles, building materials and instant coffee. The law grants certain tax and import-duty exemptions. Public works announced in 1956 included a \$5,000,000 port improvement project for Acajutla to be undertaken by a west German firm, and a new \$22,300,000 highway which would parallel the Pacific. In agriculture, coffee continued to dominate all other crops, but cotton had achieved important gains. (R. HN.)

Education.—In 1954 there were 2,032 primary schools with 210,125 pupils, 95 kindergartens with 11,144 pupils, 126 secondary schools with 12,376 pupils and 418 centres for combating illiteracy. Primary teachers totalled 6,286; secondary 1,164. The national university had 1,315 students and 207 professors in eight faculties.

According to the 1950 census, 57.7% of those ten years of age and over were illiterate.

Finance.—The monetary unit is the colón, valued at 40 cents U.S. currency in 1956. The 1956 budget as amended totalled 143,400,000 colones. Revenue in 1955 (preliminary figures) was 165,411,000 colones. On Dec. 31, 1955, the external debt was \$4,246,757 and £352,920; the internal debt was 10,000,000 colones. Currency in circulation (Sept. 30, 1956) totalled 91,400,000 colones; demand deposits, 112,510,000 colones. The U.S. department of commerce estimated U.S. direct private investments in 1955 at \$24,000,000, of which public utility investments accounted for \$17,000,000.

The cost-of-living index (San Salvador) stood at 112 in June 1956 (1953=100).

Trade and Communications.—Exports in 1955 totalled 267,327,000 colones; imports, 230,191,000 colones. Leading exports were coffee (86%), cotton (8%), vegetable oils, livestock and cottonseed meal. Leading customers were the U.S. (64%), western Germany (17%), the Netherlands (3%), the U.K. (2%) and Honduras (2%); leading suppliers, the U.S. (56%), western Germany (8%), the Netherlands (5%), Honduras (5%) and the U.K. (3%).

The two principal railroads have 385 mi. of main-line track, all narrow gauge. National highway mileage (1950) was 1,693, of which 934 mi. were all-weather. On Jan. 1, 1954, there were 10,551 automobiles and 4,702 trucks; telephones (Jan. 1, 1955) numbered 9,876, of which 74% were automatic.

Production.—Agricultural production estimates in the 1955-56 crop year included coffee 1,250,000 bags of 132 lb. each; cotton 132,000 bales of 500 lb. gross weight; sugar 45,000 short tons; rice (rough) 72,000,000 lb.; tobacco (1955) 1,832,000 lb. In 1953 there were 827,430 cattle, 261,252 pigs and 20,451 sheep and goats. According to the 1950 industrial census, there were 11,106 industrial establishments, only 117 of which had more than 50 employees.

Installed electric power capacity totalled 55,000 kw. in 1955; production (public use only) was 92,000,000 kw.hr. In 1955, 3,818 troy oz. of gold and 230,054 oz. of silver were produced.

(J. W. Mw.)

ENCYCLOPEDIA BRITANNICA FILMS.—*Central America* (1944).

Salvation Army. This organization was founded in 1865 by the Rev. William Booth, a Methodist minister, in London, Eng. Its primary aim was to lead unchurched people into spiritual adjustment with their Creator. By 1956 the Salvation Army had become a world-wide movement, with chapels and institutions in 85 countries and colonies, preaching the Gospel of Christ in 81 languages and dialects, ministering through 17,630 centres of evangelism and more than 1,500 institutions—hospitals, shelters, schools, farms, etc.

The organization's world-wide activities were directed in 1956 by Gen. Wilfred Kitching from the international headquarters in London. It had 26,765 ordained personnel, of whom more than 5,000 were in the United States. The co-ordinating head in the United States was Commissioner Donald McMillan, national commander, with headquarters in New York city.

The Salvation Army is one of the seven constituent agencies of the United Service organizations (U.S.O.), and in 1956 it operated 34 U.S.O. units. The third annual National Salvation Army week channelled the movement's story of service through 1,800 daily and 7,000 weekly newspapers, hundreds of radio and television stations and church and civic groups. During the year thirty-nine 25-minute dramatic radio programs were produced and were broadcast from 488 stations. The stories were based on actual case histories from Salvation Army files. A first series of 15-minute devotional programs over television was planned for 1957.

Statistical records indicated 66,880 converts in the United States during 1956. Attendances at adult meetings totalled 9,984,896, and at Sunday school services 4,000,000. (Do. McM.)

Samoa, American. The Samoan Islands extend from 13° 26' to 14° 22' S. lat. and from 168° 10' to 172° 48' W. long., and are about 2,700 mi. east of Australia and 2,200 mi. south of the Hawaiian Islands. American Samoa consists of the inhabited islands of Tutuila, Tau, Olosega, Ofu and Aunuu, and the uninhabited coral atoll, Rose Island. Swains Island, 210 mi. northwest of Tutuila and owned by one family, was made a part of American Samoa in 1925. Total area of American Samoa is 76 sq.mi. and total population (1950 census 18,937) was estimated in 1956 at 22,500 with about four-fifths of the population on the main island of Tutuila. Pago Pago (pop. 1950 census, 1,586), on Tutuila, is the capital. About four-fifths of the population are Protestants.

History.—American Samoa is an unorganized United States possession, administered by the department of the interior since July 1, 1951. Richard Barrett Lowe, appointed as governor in Sept. 1953, resigned in Oct. 1956 to become governor of Guam. He was succeeded by Peter T. Coleman, native-born Samoan, and attorney general of American Samoa since July 1955. Secretary of American Samoa in 1956 was Allan Macquarrie.

A constitutional committee, consisting primarily of Samoans, was at work in 1956 developing a territorial constitution.

Education.—It was estimated in 1955 that 99% of all persons 10 years of age or older were literate. As of June 30, 1955, there were 6,057 students enrolled in 61 public and 6 missionary schools. There were 241 public school teachers. Expenditures for education during the fiscal year ended June 30, 1955, represented more than 16% of total expenditures.

Finance and Trade.—Economic conditions continued to improve in 1955 and 1956 as the result of new enterprises and industries which had been established, including fish cannery operations and the cultivation of cocoa and coffee. Copra, however, was still the most important cash crop. Estimated production of principal crops for the twelve months ended June 30, 1955, were copra 1,680 metric tons, citrus fruits 100 tons, bananas 2,500 tons, breadfruit 2,400 tons, and taro 1,500 tons. There were 250 cattle, 2,900 hogs, and 11,950 chickens in American Samoa in 1955. There was also an active native handicraft industry producing floor mats and woodcraft.

Imports in the fiscal year ended June 30, 1955, totalled \$987,968, of which the United States was the major source followed by Australia and New Zealand. Exports totalled \$1,270,548 of which canned tuna accounted for more than 75% and copra 20%. Revenues collected during the 1954-55 fiscal year totalled \$591,317; expenditures \$1,565,101. The difference between revenues and expenditures was made up by U.S. government appropriations. The Bank of American Samoa, a government institution operated by the American Trust Company of San Francisco, is American Samoa's only banking institution. As of June 30, 1955, it had a capital of \$100,000 and assets of \$1,669,159.

Transportation and Communications.—In 1954 Tutuila had 69 mi. of roads, of which 4 mi. were surfaced. Commercial air service was inaugurated in Jan. 1956 with Pan American World Airways making regularly scheduled flights, stopping at Tutuila and connecting with flights between Hawaii and Australia. Cruise ships of the Matson Line were expected to begin calling at Pago Pago in the fall of 1956. One radio broadcasting station, WVUV, operated by the government, was in operation in 1956. (S. Nr.)

Samoa, Western: see NEW ZEALAND; TRUST TERRITORIES.

San Francisco. The population estimate for the city and county of San Francisco, Calif., as of Jan. 1, 1956, was 807,000 persons, compared with 775,357 reported by the U.S. bureau of the census, April 1, 1950. Total area, 93.1 sq.mi.; land area, 44.6 sq.mi. The mayor of San Francisco, George Christopher, was elected for a four-year term, commencing Jan. 8, 1956.

There were 127 public schools in the city in 1955 with an enrolment of 158,861 and a total average daily attendance of 87,235. Several thousand students attended private and technical schools. In 1955 there were 26,491 attending Catholic schools.

Total employment in the city in July 1956 was 476,700. Retail trade based on taxable sales for 1955 amounted to \$1,631,823,000; sales of food for off-premise consumption and of gasoline, which are not included in taxable sales, would increase total sales in 1955 to about \$2,000,000,000. Wholesale trade in San Francisco in 1955 amounted to about \$4,967,000,000. The value added by manufacture in San Francisco in 1955 was \$500,789,000 compared with \$410,000,000 in 1948, according to the U.S. bureau of the census.

The total foreign trade passing through the San Francisco customs district amounted to \$770,149,248 in 1955, of which \$415,134,080 represented exports and \$355,015,168 imports.

San Francisco's tax rate for the fiscal year 1956-57 was \$7.06 per \$100 assessed valuation. The assessment roll for the fiscal year was \$2,165,381,841. Estimated fiscal-year revenue amounted to \$223,903,028 of which \$92,890,241 would be derived from city taxes. The city's bonded debt limit for future bond sales, as of June 30, 1956, based on the 1956-57 assessment, amounted to \$131,046,283. Bonds outstanding not matured on June 30, 1956, amounted to \$174,279,000. Bonds authorized but unsold June 30, 1956, amounted to \$118,460,000.

City officials of San Francisco proposed a capital improvement program for 1956-57 amounting to \$52,793,080 and for the five-year period 1956-62, amounting to \$308,719,750. The program of expenditures included water supply and distribution, traffic way signals and lights, recreation and parks, public health, sewers and disposal plants, municipal railway, police and fire protection and libraries and museums.

Some important events which occurred in San Francisco during the 1955-56 period included: the announcement by the Crown Zellerbach corporation, manufacturer of forest products, of the construction of a 20-story steel and glass ultramodern structure to cost approximately \$10,000,000; opening to traffic of the new 5.5 mi., \$68,000,000 Richmond-San Rafael bridge, spanning the upper reaches of San Francisco bay, Aug. 31, 1956; the opening of the new \$1,000,000 San Francisco flower terminal Sept. 12, 1956, to provide wholesale outlets for the Bay region flower-growing area, the largest in the country; progress toward the ultimate redevelopment of the produce mart area and the establishment of a new produce mart on a different site; and, since Sept. 1955, authorization of nearly \$60,000,000 in building construction, of which \$25,000,000 was for new nonresidential building. (R. B. KR.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*California* (1955).

San Marino. A small republic in central Italy (with which it is united by customs union), San Marino is entirely surrounded by the province of Emilia and is situated on the slopes of Monte Titano, 14 mi. S.W. of Rimini. Area: 38 sq.mi. Pop. (1955 est.) 14,000. Language: Italian. Religion: Roman Catholic. San Marino is governed by two *capitani reggenti* appointed every six months by a grand and general council elected by universal suffrage every four years.

History.—The event of the year 1956 was the establishment of diplomatic relations with the U.S.S.R. This was decided on July 3 by the communist-controlled grand and general council. A delegation of the Sammarinese Communist party was present in Moscow in February at the 20th congress of the Communist party of the Soviet Union.

Education.—Schools (1955): primary 18, pupils 1,492; secondary 3, pupils 208.

Finance.—San Marino uses Italian currency. In 1956 the lira was valued at 625 to U.S. \$1. Budget (1954-55 est.) balanced at 695,055,358 lire; (1955-56 est.) 711,110,638 lire. Subsidy from Italy: 150,000,000 lire per annum.

Santo Domingo: see DOMINICAN REPUBLIC.

Sao Tomé: see PORTUGUESE OVERSEAS TERRITORIES.

Sarawak: see BRITISH BORNEO.

Saskatchewan. Central of the three prairie provinces of Canada. Saskatchewan was created in 1905 by act of the federal parliament. Area: 251,700 sq.mi. Pop. (1951 census) 831,728; (1956 est.) 897,000. Capital: Regina, pop. (1951 census, 1956 est. in parentheses) 71,319 (88,797); Saskatoon, seat of provincial university, 53,268 (70,843).

History.—The provincial legislature passed 77 public bills during the fourth session of the 12th legislature. These were generally of a noncontroversial nature. The legislature approved two resolutions having to do with the grain glut—one urging the federal government to make provision for cash advances on farm-stored grain, the other asking that the movement of box-cars in the transportation of grain be expedited—and a third resolution asking the provincial government to consider the extension of the franchise to treaty Indians. A select special committee of the legislature was set up to study and report on markets, marketing and price policies as these related to the farm income problem in Saskatchewan. The public hearings and the debate on the committee's findings aroused wide interest. Biggest political news of 1956 was the provincial election held on June 20, 1956. The Co-operative Commonwealth Federation (C.C.F., Democratic Socialist Party) under Premier T. C. Douglas was returned to power. Party standings (previous standing in parentheses) were: C.C.F. 36 (42); Liberals 14 (10); Progressive Conservatives nil (1); Social Credit 3 (nil).

Oil and gas exploration and development again made rapid progress. During the summer of 1956 the 2,000th oil well came into production. The Saskatchewan Power corporation served the cities of Moose Jaw and Swift Current with natural gas while extending electrical service to a further 7,500 farms. The Eldorado Mining and Refining Ltd., a federal crown company, increased its output of uranium ore in the Beaverlodge area from 500 to 700 tons daily output. Gunnar Mines went into production with an initial daily output of 1,250 tons.

Education.—During the 1954-55 school year there were 32,495 pupils attending secondary schools and 176,006 attending public schools, making a total of 208,501. There were 7,679 teachers with an average daily pupil enrolment of 155,044. Total school operating revenues for 1954-55 totalled \$34,598,705.

Public Health and Welfare.—During 1955 the Saskatchewan Hospital Services plan, government-sponsored program of hospital care insurance, covered 822,956 persons, about 97% of those eligible to become beneficiaries. A total of 165,006 patients (excluding newborns) were admitted to hospital care under the plan. Total public assistance expenditure by the provincial government, including old-age security supplementary allowances, blind persons' allowances, old-age assistance, mothers' allowances and social aid for fiscal year 1954-55 was \$4,110,832.

Transportation and Communication.—At March 31, 1956, there were 166,367 passenger autos and 625 public service vehicles on 164,121 miles of provincial and municipal road. Of this mileage, 1,333 mi. were bituminous, 21,187 mi. gravelled. There were 8,739 miles of railway, 15% of the Canadian total. During 1955, 174,417 telephones were in service. There were 11 radio and 2 television transmitting stations. Work on the Saskatchewan portion of the Trans-Canada highway neared completion.

Banking and Finance.—The 1956-57 provincial budget estimated revenues of \$87,172,000 and expenditures at \$87,147,080. As of Dec. 31, 1955, net debt less sinking funds and revenue producing loans and advances was \$70,538,000. In 1955 the two largest publicly owned corporations, power and telephones, showed a net surplus of \$4,111,200, while the other eight crown companies together showed a net surplus of \$1,366,280. At Dec. 31, 1955, there were 282 active credit unions, which loaned \$15,621,498 to 80,396 members.

Agriculture.—Main crops, 1955 (1956 Canadian dept. of agriculture est. in parentheses): wheat, 298,000,000 bu. (309,000,000); oats, 135,000,000 bu. (160,000,000); barley, 104,000,000 bu. (100,000,000); rye, 8,200,000 bu. (4,000,000); flax, 11,800,000 bu. (18,000,000). Official preliminary estimate of farm cash income for 1955 was \$425,100,000; valuation of major items: wheat, \$216,632,000; oats, \$15,082,000; barley, \$32,250,000; rye, \$3,698,000; flax, \$23,131,000; cattle, \$57,426,000; hogs, \$21,872,000; poultry, \$10,289,000; dairy products \$23,746,000. On June 1, 1956, there were 1,490,000 cattle and 645,000 hogs.

Fisheries, Furs and Forestry.—Commercial fish production in 1955-56 was 10,153,177 lb. valued at \$1,616,961 (1954-55, 10,525,881 lb. at \$1,644,183). For the same year the timber cut, all types, was 22,860,322 cu.ft. valued at \$7,375,510 (1954-55, 30,117,017 cu.ft. at \$9,064,857). The total value of wild fur in 1955-56 was \$2,837,120 (1954-55, \$3,715,032).

Manufacturing.—Statistics are for 1954 when 11,526 employees, in 1,010 establishments, earned \$33,509,833 in salaries and wages. Raw materials worth \$169,326,000 were converted into finished products with a gross value of \$280,733,784. The four leading classes in terms of value were (number of employees in parentheses): petroleum products, \$76,494,298 (1,109); flour mills, \$43,436,789 (784); slaughtering and meat packing, \$30,664,206 (1,075); butter and cheese, \$27,862,528 (1,283). The total value of industrial products increased by \$14,120,693 over 1953.

Mining.—During 1955 oil production was 11,486,500 bbl. Natural gas production was 11,252,971,000 cu.ft. Preliminary value figures for all mineral production for 1955 was \$83,769,427 as compared with \$68,216,009 actual in 1954. The leading minerals were copper, \$24,226,875; zinc, \$13,465,725; sodium sulphate, \$2,759,034; coal, \$4,171,399; gold, \$2,893,111; petroleum, \$18,491,500. (J. H. AR.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Prairie Provinces of Canada* (1943).

Saudi Arabia. This Arab kingdom covering four-fifths of the Arabian peninsula has an area of about 617,760 sq.mi. and a population (1952 est., no census ever taken) of 7,000,000. Religion: Moslem. Chief towns (pop., 1954 est.): Riyadh (cap.) 80,000; Mecca 150,000; Jidda 100,000; Hufuf 100,000; Buraida 50,000; Medina 50,000. King, Saud ibn Abdul Aziz al Saud. Prime minister and viceroy of Hejaz in 1956, Amir Faisal ibn Abdul Aziz, crown prince and eldest brother to King Saud.

History.—The alliance between Saudi Arabia, Egypt and Syria was formally maintained and strengthened during 1956 by repeated declarations and by two meetings of King Saud with the Egyptian and Syrian presidents, one in Cairo, Egy., in March, and one at Riyadh, Saudi Arab., in September, during the Suez canal crisis. One or two cracks, however, developed in the Saudi-Egyptian partnership. King Saud was said to have become alarmed at the growing number of Egyptians employed in his kingdom, and at the influence they were exercising, and in August a number of Egyptian officers, who had been training Saudi officers, were discharged on the grounds that they were disseminating antimonarchical principles and preparing a coup against the king. Also, during the Suez crisis the king received a visit from King Faisal of Iraq, at which the two monarchs were reported to have discussed their common interest in assuring passage through the Suez canal for the oil produced in their two countries. Together with Egypt and Syria, however, Saudi Arabia promised funds to Jordan to replace the British subsidies if Jordan denounced its treaty with Britain.

A Chinese trade mission visited Saudi Arabia requesting oil supplies and the Chinese consulate at Jidda was reopened.

The Buraimi dispute remained unsettled. The British-officered Arab levies that occupied the oasis in 1955 in defense of the rights of the sultan of Muscat and the sheikh of Dhahi remained in possession. Arrangements were made with Syria and Jordan for rebuilding the Hejaz railway (constructed in the days of the Ottoman empire and destroyed during World War I) which would connect Damascus, Syr., and Amman, Jordan, with Medina.

A military academy was established at Riyadh, and a Saudi Arabian mission visited Czechoslovakia with a view to buying arms. Large sums of money were spent on municipal development, especially at Riyadh, which began to assume the aspect of a modern city with air-conditioned skyscrapers. However, it was said that only one-fifth of the oil royalties was being ploughed back into the country's economy for improving the condition of the people. This was causing discontent among the politically conscious urban population. The Arabian-American Oil company denied reports that it had advanced the king royalties against the oil production for the next two years, affirming that it only paid for oil actually produced. There was a widespread belief, however, that the king had mortgaged two years' royalties in order to raise loans from certain European banks.

(See also MIDDLE EASTERN AFFAIRS.) (E. S. AH.)

Education.—Schools (1949): primary 207, pupils 27,712, teachers 875; secondary 8, pupils 1,116, teachers 181; vocational 5, pupils 311, teachers 47; 1 preuniversity school, pupils 25, teachers 3.

Finance.—Monetary unit: riyal; about 10.35 riyals=£1 sterling and 1 riyal=about 28 U.S. cents. Budget (1954-55 est., U.S. dollar equivalent): revenue \$305,940,000; expenditure \$361,330,000; estimated revenue from oil royalties and income tax \$257,700,000.

Foreign Trade.—Imports (1953 est.) £58,000,000; exports £235,000,000. Main imports: textiles, cereals, tea, coffee, sugar, rice, motor vehicles, building materials. Main exports: oil; also gold concentrates, hides and skins, gum, dates, clarified butter.

Transport and Communications.—Main roads (1954): Jeddah-Mecca 72 km. asphalted; Jeddah-Medina 168 km. completed; motor track Mecca-Persian gulf 1,325 km. Air transport: Saudi Arabian Airlines, five airports. Radio receiving sets (1950) 10,000. Railways (1956) 352 mi. open. Telephones (Jan. 1955) 8,130.

Agriculture.—Production (metric tons): wheat (1954) 965,000; dates (1948-52 average) 182,000.

ENCYCLOPEDIA BRITANNICA FILMS.—*Arabian Bazaar* (1953); *The Middle East* (1955); *Planning Our Foreign Policy* (Problems of the Middle East) (1955); *Wanderers of the Desert* (1953).

Savings and Loan Associations. New peaks were reached during 1956 for the 6,000 operating savings and loan associations in the United States in terms of total assets, total mortgage loans held and total savings capital.

Continued Growth.—During 1956 the net increase in savings capital at all savings and loan associations exceeded \$5,000,000,000, slightly above the previous record high of 1955. The net inflow of savings during the last five months of 1956, however, was below that in the corresponding period of 1955. The increase in total assets of all savings and loan associations in 1956 was about \$5,600,000,000, a gain of 15%, as compared with the record increase of \$6,100,000,000 or 19% in 1955. Total assets of all savings and loan associations at the end of 1956 amounted to \$43,200,000,000.

Though they experienced the most rapid rate of growth, the savings and loan associations still ranked fourth among all financial institutions in volume of individual savings held. On June 30, 1956, first place was still held by life insurance companies, second place by savings bonds of the United States government and third place by commercial banks. Savings and loan associations were fourth, followed by mutual savings banks.

Inflow and Withdrawals.—Although new savings continued to flow into the savings and loan associations at a record rate during 1956, withdrawals rose still more. In the first 11 months of 1956 gross savings receipts were up almost 15% over the corresponding period of 1955, but withdrawals showed an increase of almost 21%. As a result, the net inflow of savings during the 11 months was only 2½% more than in the same period of the previous year. During the first 11 months of 1956, the ratio of total withdrawals to gross savings receipts was 70.1%, as compared with the corresponding withdrawal ratio of 66.6% in the year before. Likewise, the ratio of withdrawals to the amount of savings capital held by the savings and loan associations rose.

Asset Distribution.—At the end of Sept. 1956 total assets of all savings and loan associations amounted to \$41,600,000,000. Mortgage loans held came to \$34,900,000,000, with conventional loans constituting more than three-fourths of the total. United States government obligations were owned in the amount of \$2,700,000,000, and cash holdings were \$1,750,000,000. Savings capital totalled \$35,600,000,000. Federal Home Loan bank advances were \$1,100,000,000. Reserves and undivided profits exceeded \$2,800,000,000.

During 1956 the nation's savings and loan associations acquired fewer mortgage loans than during the preceding year but increased their holdings of United States government obligations and cash and decreased borrowings.

Total mortgage loans made during the first 11 months of 1956 were 8% below the record total for the corresponding months in 1955. Savings and loan associations, however, continued as the leading lender for home financing, recording 35% of total home mortgage financing during 1956, with commercial banks next at 20%. It was estimated that about 365,000 of the 1,100,000 homes built in 1956 were financed by savings associations.

The net increase in mortgage loans held in the 12 months from Oct. 1955 through Sept. 1956 for all savings and loan associations totalled \$4,300,000,000, as compared with a net increase in total assets of \$5,300,000,000 and an increase in total savings capital of a little more than \$5,000,000,000. During this period savings and loan associations increased their holdings of United States government obligations and cash by about \$550,000,000, and made net repayments of borrowings, primarily Federal Home Loan bank advances, amounting to \$150,000,000. These conservative actions built up the net liquidity position of the savings and loan associations.

Relaxation of Restraint.—During the third quarter of 1955 the increase in mortgage holdings of savings and loan associations substantially outran the net inflow of savings. This brought about the imposition of credit restriction policies by the Federal Home Loan Bank board in Sept. 1955. During 1956 the Federal Home Loan Bank board gradually relaxed these credit restriction policies. Successive steps were taken toward relaxation of credit restriction in Dec. 1955, April 1956 and Sept. 1956. The policy of the Federal Home Loan Bank board in effect late in the year regarding Federal Home Loan bank advances to member savings and loan associations provided for regular advances for purposes other than meeting net withdrawals, provided the total amount of such advances outstanding did not exceed $12\frac{1}{2}\%$ of withdrawal accounts, with an additional provision for emergency advances up to $2\frac{1}{2}\%$.

(J. K. L.)

Savings Banks: see BANKING.

Schools: see EDUCATION; UNIVERSITIES AND COLLEGES. See also section *Education* in articles on countries and states.

Scotland: see GREAT BRITAIN & NORTHERN IRELAND, UNITED KINGDOM OF.

Scrap: see SECONDARY METALS.

SEATO: see SOUTHEAST ASIA TREATY ORGANIZATION.

Seaton, Frederick Andrew (1909—), U.S. government official, was appointed secretary of the interior May 28, 1956, by Pres. Dwight D. Eisenhower to succeed Douglas McKay, who had resigned to campaign for election as Republican senator from Oregon. Born in Washington, D.C., on Dec. 11, 1909, Seaton attended Kansas State college, Manhattan, and was a radio sports announcer and then an editor for newspapers in Manhattan, Kan., until 1933, when he founded his own publishing firm, acquiring newspaper, magazine and radio-television properties in several western states.

Seaton's active interest in Republican politics dated from his college days, when he was chairman of the Riley county Young Republican club in Kansas. In 1936 he was secretary to Alfred M. Landon during the latter's unsuccessful campaign for president. From 1945 to 1949 Seaton served two terms in the Nebraska state legislature and in the latter year he was secretary to Harold E. Stassen. In 1951 he was appointed senator from Nebraska to fill the unexpired term of Sen. Kenneth S. Wherry. In 1952 he joined the presidential campaign staff of General Eisenhower, having acquired the reputation of being one of the most effective speakers among the younger Republicans. Eisenhower appointed him assistant secretary of defense for legislative affairs in 1953, and two years later he joined the White House staff as an administrative assistant to the president. The senate confirmed him as secretary of the interior June 6, 1956, and he was sworn into office June 8.

SEC: see SECURITIES AND EXCHANGE COMMISSION.

Secondary Education: see EDUCATION.

Secondary Metals. Metals that are produced as by-products of other metals—such as silver in mining base metals—and those recovered from old and new scrap are included under secondary metals shown in Table I, based on data from U.S. bureau of mines reports. New methods of recovery were being studied during 1956, and the proportion of metal recovered from scrap to primary metal production was increasing. In 1955 secondary lead recovery exceeded primary output for the tenth year. Secondary tin consumed was 29,000 tons compared with 59,100 tons of primary tin. Although recoveries of both types of secondary metal are shown in the table, only the recovery from old scrap adds to the available supply.

Table I.—Secondary Nonferrous Metals Recovered in the U.S.

(in 000 short tons or fine ounces)

	1950	1951	1952	1953	1954	1955†
Copper—tons						
As metal	260.7	186.4	173.9	242.9	212.2	246.9
In alloys	699.1	722.9	713.9	694.0	609.6	726.2
In compounds	17.4	22.9	15.4	21.6	18.1	15.9
Total	977.2	932.3	903.2	958.5	839.9	989.0
From old scrap*. . .	485.2	458.1	414.6	429.4	407.1	514.6
Lead—tons						
As metal	129.3	168.9	140.1	126.6	120.0	128.3
In alloys	353.0	349.2	331.2	360.1	360.9	373.7
Total	482.3	518.1	471.3	486.7	480.9	502.1
From old scrap*. . .	427.5	441.7	411.8	428.8	425.0	449.2
Zinc—tons						
As metal	104.1	85.1	83.1	78.6	98.5	98.8
In alloys	178.2	188.5	196.1	181.4	147.2	177.1
In compounds	43.7	40.8	31.2	34.7	26.1	28.9
Total	326.0	314.4	310.4	294.7	271.8	304.8
From old scrap*. . .	74.1	68.2	74.7	64.2	72.7	83.5
Tin—tons						
As metal	4.0	3.7	3.2	3.2	3.3	3.3
In alloys	30.7	30.2	28.6	27.1	25.3	27.6
In compounds	0.7	0.5	0.4	0.6	0.7	0.8
Total	35.5	34.4	32.3	30.9	29.3	31.7
From old scrap*. . .	24.2	23.0	22.9	21.4	19.1	21.8
Aluminum—tons						
As metal	2.1	5.3	4.9	5.2	5.8	9.0
In alloys	241.2	285.9	296.3	358.8	282.6	323.3
In compounds	0.4	1.4	3.3	4.7	3.6	2.0
Total	243.7	292.6	304.5	368.7	292.0	334.3
From old scrap*. . .	76.4	76.6	71.3	78.9	60.0	74.7
Magnesium—tons						
Total (in alloys) . .	7.3	11.5	11.5	11.9	6.5	6.8
From old scrap*. . .	5.0	6.2	7.2	6.0	3.3	4.7
Nickel—tons						
Total	8.8	8.6	7.5	8.4	8.6	11.5
From old scrap*. . .	4.8	4.8	4.3	5.2	4.6	7.5
Antimony—tons						
Total (in alloys) . .	21.9	23.9	23.1	22.4	22.4	23.7
From old scrap*. . .	18.8	19.9	19.6	19.0	18.9	20.4
Platinum—ounces . .	33.9	22.8	28.6	29.5	31.0	32.9
O.P.M.i—ounces . . .	24.2	31.0	30.0	34.3	34.3	31.4
Gold—ounces	1,050	—	881	1,068	966.4	664.5
Silver—ounces	45,257	46,651	25,038	19,389	18,628.7	22,135.1

*Secondary metal recovered from old materials, the remainder having come from the reworking of new plant scrap. †Other platinum group metals. ‡Preliminary.

Iron and Steel Scrap.—In making steel in the U.S., about half of the furnace charge is scrap which contains about equal parts of old and new scrap. Old scrap is from junked equipment and new scrap is that made at plants when fabricating the new

Table II.—Scrap in the U.S. Iron and Steel Industry

(in 000 short tons)

	Pig iron output	Steel output	Plant	Scrap consumption Purchased	Total
1947	58,327	84,894	31,579	29,285	60,864
1948	60,073	88,640	32,420	32,544	64,964
1949	53,323	77,978	29,166	25,172	54,338
1950	64,810	96,836	32,094	29,403	61,497
1951	70,487	105,200	34,694	33,814	68,507
1952	61,308	93,168	34,837	34,186	69,023
1953	74,853	111,610	...	...	77,131
1954	57,948	88,312	...	...	61,354
1955	76,849	117,036	...	...	81,000*

*Preliminary.

metal. Data for 1953–55 on both types are added together in Table II, as the U.S. bureau of mines no longer reports them separately.

(F. E. H.)

Secret Service, U.S.

The major functions of the United States secret service, a bureau of the treasury department, are protection of the president of the United States and members of his family, of the president-elect and of the vice-president at his request; the detection and arrest of persons committing any offenses against the federal laws relating to obligations and securities of the United States and of foreign governments; and the detection and arrest of persons violating other laws cited in title 18, U.S. code, section 3056. During the year ended June 30, 1956, the secret service received 1,016 cases requiring investigation in connection with the protection of the president.

In the suppression of counterfeiting, agents captured 18 plants for the manufacture of counterfeit paper money and \$511,760 in counterfeit bills. Of that total, \$67,635 was successfully passed on storekeepers and cashiers. The balance of \$444,125 was captured before it could be put into circulation. The representative value of counterfeit coins seized was \$6,326.16, of which \$5,405.84 was successfully passed.

There were 72 new counterfeit note issues and variations dur-

ing fiscal 1956 and 166 persons were arrested for violating the counterfeiting laws.

The secret service received 27,110 forged government checks for investigation, and there were 15,222 on hand as of July 1, 1956. Agents completed investigations of 30,619 forged checks worth \$2,631,177.84 and arrested 2,970 persons for forging government checks and bonds. Agents arrested 176 persons for crimes other than counterfeiting and forgery, making a total of 3,312 arrests. There were 3,050 convictions, representing 98.3% of convictions in all cases prosecuted, some of which were pending from the previous year.

Cases of all types received for investigation aggregated 35,458, and 18,585 cases were pending as of July 1, 1955. Although 39,264 cases were closed during fiscal 1956, 14,779 cases awaited investigation as of June 30, 1956.

The chief of the secret service attended the annual conference of the International Criminal Police organization at Vienna, Aus., in June 1956, to discuss the suppression of counterfeiting with representatives of other nations. He was elected a vice-president of the organization. (U. E. B.)

Securities: *see* BANKING; STOCKS AND BONDS.

Securities and Exchange Commission.

This bipartisan, quasi-judicial agency of the U.S. government administers laws in the general field of securities and finance designed for the protection of investors.

Securities Act of 1933.—This law seeks to protect investors by requiring (with certain exceptions) that securities offered for public sale be registered with the Securities and Exchange commission (SEC); and by prohibiting fraud in the sale of securities.

The purpose of registration is to provide financial and other factual disclosures essential to a realistic appraisal of the merits of such securities by investors, who must be furnished a prospectus containing the salient information. At the end of the 1956 fiscal year, \$116,000,000,000 of securities had been registered, \$13,100,000,000 during the past year.

Registration of securities is no guarantee against loss in their purchase, but disclosures thus provided should enable investors to make informed investment decisions; and although there is no warranty of the accuracy of the disclosures, investors who suffer losses in the purchase of registered securities have important recovery rights if the facts have been misrepresented.

Securities Exchange Act of 1934.—This law contains similar registration and disclosure requirements applicable to outstanding securities listed for public trading on national securities exchanges. Issuers thereof must file periodic reports with the SEC and the exchanges containing data essential to informed investment analyses. Similarly, in the solicitation of proxies (votes) from the holders of such securities, factual disclosures must be made so that stockholders' votes may be cast intelligently. In addition, management officials and large stockholders must report their holdings of, and transactions in, listed equity securities; and their short-term trading profits in such securities are recoverable by the issuer. This was designed to curb misuse of "inside" information. At the end of the fiscal year, 4,134 security issues of 2,594 issuing companies were so listed and registered; and exchange trading volume therein was about \$37,500,000,000 for the year. During the year, also, 2,016 proxy statements and 32,001 insiders' reports were filed.

The law also contains provisions designed to eliminate misrepresentation, manipulation and other fraudulent and deceptive practices in the purchase and sale of securities, both on ex-

changes and in the over-the-counter markets. Exchanges and over-the-counter brokers and dealers must register with the commission; and associations of the latter organized under the law for self-policing purposes also may register. All must conform their rules and trading practices to prescribed standards designed to establish and maintain free and open markets; and the commission exercises a continuing surveillance to the end that the statutory objectives are achieved. At the end of the fiscal year, 14 exchanges, 4,591 brokers and dealers, and one broker-dealer association were registered.

This law also contains important sanctions against violations. In common with the Securities act, it gives the SEC investigatory and enforcement powers and provides for court injunctions against securities violations as well as for criminal prosecution where fraud or other willful violations are indicated. In addition, it provides for revocation of the registration of brokers and dealers, and their suspension or expulsion from membership in exchanges or the broker-dealer association, for any such willful violations.

Public Utility Holding Company Act of 1935.—This law provides for regulation of holding company systems of electric and gas utility companies to protect against certain abuses in their financing and operation which led to its enactment, including improper financial and related practices and the extension of systems without regard to economies of operation, many of which thwarted effective state regulation. It also required a major overhauling of such systems to delimit their operations to integrated groups of utility properties, simplify corporate and capital structures and redistribute voting power equitably among security holders.

The integration and simplification program was virtually completed in 1956. It had resulted in the release from the act's jurisdiction by means of sales, distributions and other divestments, reorganizations, mergers and consolidations, liquidations and other actions, of 2,012 of the 2,314 companies previously subject to the law. A prerequisite to approval of all such actions, involving several billion dollars of securities and properties, was a finding by the commission (and frequently a federal district court) that the proposals were fair to security holders. Important by-products were elimination of absentee control over many utility operating companies and removal of obstacles to effective state regulation. Ultimately, about 18 integrated and simplified holding company systems with aggregate assets of about \$8,000,000,000 were expected to remain subject to continuing SEC regulation under the act.

This regulation has its primary impact upon the purchase and sale of utility securities and properties, mergers and consolidations, intercompany transactions and similar matters. Principal among these is the sale of securities to finance the business of system companies, including their plant expansion programs, with respect to which the commission must apply statutory standards designed to protect investors and consumers.

The commission also administers the Trust Indenture act of 1939, the Investment Company act of 1940 and the Investment Advisers act of 1940, and serves as adviser to federal courts in corporate reorganization proceedings under chapter X of the Bankruptcy act. (O. L. DuB.)

Seeing Eye, Inc.: *see* SOCIETIES AND ASSOCIATIONS, U.S.
Segregation, Racial: *see* CIVIL RIGHTS; EDUCATION; LAW; NEGROES, AMERICAN.

Seismology. The 12-month period ended Oct. 15, 1956, was, as in the preceding year, a period of below-normal seismic activity. This was of interest to seismologists who believe that the annual amount of energy release by earthquakes

should average out near a fixed level over a period of years. On this basis, there was reason to anticipate heightened seismic activity in coming years.

Principal Earthquakes.—In the period ended Oct. 15, 1956, at least three earthquakes received wide attention by reason of high death tolls, each shock causing at least 100 deaths. Of these, the most damaging was the shock of March 16, 1956, when 145 persons were killed in Lebanon, 32 of these in the village of Shehim. Weakly constructed houses fell in a series of recurring shocks, leaving 25,000 homeless and injuring more than 500.

Quake-ravaged Greece, which had suffered numerous destructive shocks in each of several recent years, enjoyed relative quiet during the period. A local disaster was experienced, however, on July 9 when earthquakes and a seismic sea wave killed 48 persons and injured about 100 in a group of islands in the southern Aegean sea. Property damage was high and the earthquakes and waves destroyed homes and business places. Worst hit was the island of Thera, or Santorini, where an erupting volcano added to the devastation.

India, astride one of the great earthquake belts of the world, lost 113 dead, and more than 200 were injured, when a large area in the state of Kutch was severely shaken on July 21. One thousand houses were reported to have collapsed in the town of Anjar. Telegraphic poles were uprooted, disrupting communications, and 17 freight cars were thrown from the tracks at Kandla.

Starting about June 9 Afghanistan experienced a week of recurring shocks believed to be the worst in the history of the country. One hundred persons were reported killed in Kabul, many were buried in the rubble of collapsed houses, and at least 2,000 became casualties. Rivers were diverted, roads were blocked by landslides and communications with isolated villages were cut off.

Minor Earthquakes.—Smaller shocks occurred in many places. The resort city at Acapulco, Mex., sustained heavy property damage on Jan. 8, and at least 107 persons were injured in the collapse of poorly constructed houses in the outskirts. On the following day, numerous buildings were damaged in southern Italy.

On Jan. 12 quakes destroyed 38 houses, killing 2 persons and injuring 36 in Taksony, Hung. Four days later, in distant Ecuador, a bridge was destroyed and a number of houses demolished at Portoviejo. On Feb. 20 in Peru a five-day series of quakes killed two children and caused damage in the mountains 200 mi. N. of Lima. On the same day, four persons died in the collapse of 1,000 houses in Eskisehir, Tur. Property damage was estimated at \$50,000,000.

On April 19 the province of Granada, Sp., experienced five tremors, the worst since 1884. Seven persons died and more than 100 were injured, as public buildings and church structures collapsed.

On July 16 a long series of more than 30 shocks rocked the ancient city of Mandalay in Burma, crumbling pagodas and other structures, and reduced the town of Sagaing to rubble. Thirty persons were killed. On Sept. 29 the normally restless land of Japan experienced its first important earthquake of the year when two shocks, 12 hours apart, gave Tokyo its worst shaking in five years. One person was killed and five were injured, and power installations at the U.S. army Camp Zama, southwest of Tokyo, were put out of operation.

Seismological Studies.—Numerous new stations for the observation of earthquakes were installed in many parts of the world, indicating a continuing wide scientific interest in the subject. In Tokyo, Jap., the Disaster Prevention Research institute continued the study of ground tilts and earth strain in relation to earthquake activity, in the hope of deriving methods of fore-

telling such occurrences. Apparently significant ground motions had been noted previously in close association with damaging Japanese quakes. The exploration of the basic physical structure of the earth continued, largely through the analysis of the vibrational disturbances recorded on modern seismographs.

There was sustained interest in the problems of engineering, or applied, seismology. An international conference, held at Berkeley, Calif., in June, provided a comprehensive review of recent developments in many countries subject to earthquake damage. While the United States was conducting a continuing investigation of earthquake forces, and many engineers consider them in their design work, it was commonly held that intensification of this branch of the work was much needed.

(See also COAST AND GEODETIC SURVEY, U.S.; DISASTERS.)

(E. B. R.)

Selective Service, U.S. Selective Service system operations during 1956 were influenced chiefly by three executive orders. Executive orders 10650 and 10651 were issued Jan. 6, 1956, and were designed to provide for the more favourable use of men of military age in relation to the critical needs of the defense-supporting economy and in a mobilization, and to ensure that the ready reserve would be immediately available with the least loss in the event of mobilization. These two orders were described in a White House press release as responsive to the concern of the president and the congress that the manpower needs of the armed forces be met, with due consideration of the urgent needs of the industries and scientific laboratories which were critically necessary for the support of the defense effort. Executive order 10659, dated Feb. 16, 1956, amended Selective Service regulations.

Executive order 10650 prescribed Selective Service regulations which established the procedures by which registrants were to be selected for enlistment in the special reserve program established by the Reserve Forces act of 1955 for persons with critical skills. The act provided that such persons might enlist for three to six months of active duty for training after which they would be transferred to the reserve for the remainder of their eight-year obligation.

Executive order 10651 provided regulations under which the military service would effect a continuous screening of the ready reserve. This would assure that the ready reserve would be immediately callable with minimum losses in the event of mobilization, and with minimum necessary effect on the defense-supporting economy.

Executive order 10659 changed the priority in which registrants would be called for induction; the order also provided that aliens from countries with which the United States had treaties containing provisions for the exemption from military service of their nationals while in the U.S., should be exempt from registration and induction only if they had been admitted to the U.S. temporarily.

Also exempted from induction by the order were aliens who had served at least 18 months since June 24, 1948, in the armed forces of a nation associated with the United States in mutual defense activities, if such nation granted a similar exemption from service in its armed forces to United States citizens who had served at least 18 months in the U.S. armed forces subsequent to June 24, 1948.

The order exempted from registration and liability for induction aliens who were in the United States pursuant to the provisions of certain of the agreements pertaining to the North Atlantic Treaty organization. The order also clarified the exempt status of aliens temporarily admitted to the U.S. for study at an approved institution of learning.

Registrants under the age of 18½ and registrants with critical

skills selected pursuant to executive order 10650 of Jan. 6, 1956, for such enlistment, who enlisted in the new eight-year ready reserve program established by the Reserve Forces act of 1955, would be deferred while they continued to serve satisfactorily in such program and upon completion of their eight-year period of service would be classified as exempt from further peacetime induction.

Registrants who, prior to attaining the age of 18½, enlisted in organized units of the federally recognized national guard or of the ready reserve under the programs established by the Reserve Forces act of 1955 and the Universal Military Training and Service act, as amended, were deferred from induction while they served satisfactorily, and, upon attaining the age of 28, would also be classified as exempt from further peacetime induction. If such registrants satisfactorily completed eight years of such service and during that time performed not less than three consecutive months of active duty for training, they would also be classified as exempt from peacetime induction.

Registrants who enlisted in the above-mentioned programs and who failed to serve satisfactorily therein as determined by the armed force concerned, would be inducted into the armed forces for 24 months of training and service prior to all other registrants.

The amended regulations also implemented provisions of the 1955 amendments to the Universal Military Training and Service act by providing that registrants who since Sept. 16, 1940, had served on active duty in the armed forces for not less than six months and were discharged for the convenience of the government, or who since that date had served in the armed forces on active duty not less than one year, or who had served not less than 24 months as commissioned officers in the public health service or coast and geodetic survey, should be classified as exempt from induction. Unless they met these criteria registrants who had served six months or more on active duty since June 24, 1948, would no longer be classified as exempt from induction.

The executive order also provided, in accordance with the 1955 amendments, that the existence of a shortage or surplus of any agricultural commodity should not be considered in determining whether any individual should be deferred because of the essentiality of his employment in agriculture.

Also, in accordance with a provision of the Reserve Forces act of 1955, any registrant who, after enlisting in a reserve component of an armed force, had been commissioned therein upon graduation from officers' candidate school, and who was not ordered to active duty as a commissioned officer, would be deferred from induction so long as he performed satisfactory service as a commissioned officer in a unit of the ready reserve.

Persons who entered the R.O.T.C. and certain other officer procurement programs of the armed forces were thereafter required, in order to be classified as deferred by reason of membership in such programs, to agree to remain a member of a regular or reserve component for six years after they would be commissioned instead of eight years as previously required.

The order, in accordance with the 1955 amendments, also provided with respect to special registrants who were physicians, dentists and veterinarians, that such persons should be classified as exempt from induction when they attained the age of 46. They would also be classified as exempt from induction if they had attained the age of 35 and had applied for a commission in the armed forces as a physician, dentist or veterinarian and had been rejected solely for physical disqualification. (L. B. H.)

Reserve Forces Act of 1955.—During 1956, the first year of operations under the Reserve Forces act of 1955, significant progress was made in strengthening the reserve components of all the military services. Each service offered one or more of

the new reserve enlistment programs provided by the act. Through these programs more than 137,000 members had been added to the ready reserve rolls.

In addition, more than 1,000 persons possessing scientific, engineering or other critical civilian skills, and employed in defense-supporting industry or research, were selected by local selective service boards to undergo six months' active duty reserve training instead of being absent from their employment for two years of military service.

The substantial number of volunteers into the new reserve enlistment programs was a factor in the increase to more than 900,000 of members participating in paid reserve training programs. This was the largest number of individuals in training in the history of the reserve forces.

Screening of the ready reserve was initiated by all the military services. This action required the services initially to review the records of more than 3,000,000 ready reservists to select those eligible for discharge, retirement or transfer to the stand-by reserve under law and regulations. The screening process would remove from the ready reserve persons who would not be immediately available for military service upon mobilization, such as those with critical civilian skills excess to the needs of the military, elective and appointive officials of the federal and state governments and reservists whose recall in time of emergency would create an extreme personal or community hardship. Priority in screening was given to combat veterans.

Those who were transferred to the stand-by reserve under the screening process would be subject to involuntary active duty only in time of war or national emergency declared by the congress, and then only when their availability had been determined by selective service.

During the second session of the 84th congress, one important modification of the Reserve Forces act of 1955 was legislated. Whereas the original act established \$50 per month as the rate of pay for young men while undergoing the six months of active duty training, the change enacted by congress put such young men in the same pay and allowance categories as other members of the service in the same grade. (J. A. N.)

Selenium: see MINERAL AND METAL PRODUCTION AND PRICES.

Semenov, Nikolai N. (1896—), Russian chemist, was born at Saratov. He was awarded the 1956 Nobel prize in chemistry, jointly with Sir Cyril Hinshelwood (*q.v.*), for his work on the kinetics of chemical reactions. Semenov studied at St. Petersburg (later Leningrad) university and began his first scientific researches as early as 1912. He had long been known to chemists for his outstanding work on the mechanism of chemical transformations, and his book on *Chemical Kinetics and Chain Reactions* was published in English translation in 1935. Less well known is his work on the propagation of explosion waves, which appeared only in Russian. He is a member of the Soviet Academy of Sciences and director of the Institute of Chemical Physics in Moscow. Semenov was the first Soviet citizen to be awarded a Nobel prize.

Senate: see UNITED STATES CONGRESS.

Senegal: see FRENCH UNION; FRENCH WEST AFRICA.

Seventh-day Adventists. The major activities of this church during 1956, and its plans for the immediate future, are best revealed in certain actions of the annual autumn council held in Takoma Park, Md., the last week in October, as follows: to introduce a course in the theological seminary to orient prospective missionaries to the cultural and other distinctive features of mission lands; to offer

special residency training in the denomination's hospitals for medical missionary appointees; to provide financial aid for nationals of various lands who wish to become doctors and dentists; to create in Washington, D.C., a graduate school with university status; to set the date and place of the next quadrennial session for June 19 to 28, 1958, at Cleveland, O.; to change the evangelistic journal, *Signs of the Times*, from a weekly to a monthly; to expand the vacation Bible schools.

The budget voted at the autumn council for 1957 was \$22,823,758, or more than \$2,000,000 larger than that for 1956. This budget did not include the monies involved in the regular operating of the conferences in North America.

The overseas personnel present at the council brought reports of increasing difficulties confronting mission work in many lands where national religions, under the stimulus of political nationalism, were resurgent. The high light of overseas reports was one given by two European delegates who had just completed a rather extended trip to the U.S.S.R. Their illustrated report revealed that Adventist churches were intact and active, with the membership given a new measure of freedom to worship, though not to propagandize their religion.

The membership in the United States and Canada as of Sept. 30, 1956, was 298,181. This represented something less than 30% of the total world membership.

(See also CHURCH MEMBERSHIP.)

(F. D. N.)

Seychelles. This British colony and dependencies consist of 92 islands in the Indian ocean. Area: 156 sq. mi. (Mahé 55 sq. mi.). Pop.: (1947 census) 34,632, (1955 est.) 338,700; Negro, Creole, Indian, European, Chinese. Language: English; French Creole patois. Religion: Christian (about 66% Roman Catholic). Capital, Victoria (Mahé Island), pop. (1952 est.) 10,000. Governor in 1956, Sir William Addis.

History.—In March 1956 Archbishop Makarios III, deported from Cyprus, arrived to reside as an exile in the Seychelles. Two months later a Labour member of parliament, Eric Fletcher, urged the British government to inquire into allegations of persecution and discrimination against non-Roman Catholics. In July Fletcher caused an uproar in parliament with accusations against the chief justice of the Seychelles. Hopes of solving the islands' unemployment problem were raised later in the year by mention of the possibility of the establishment of a British naval base.

The duke of Edinburgh arrived in Seychelles on Oct. 19 for a visit, on his way to Australia to open the Olympic games.

(K. I.)

Education.—(1954) Government and mission schools: primary 32, junior secondary 2, secondary 2 (with primary departments), vocational 1; all pupils 5,740; all teachers (excluding private) 146, student and pupil teachers 70.

Finance and Trade.—Monetary unit: Seychelles rupee, equal to 1s. 6d. sterling and 21 cents U.S. Budget (1955 est.): revenue Rs. 3,977,419, expenditure Rs. 3,800,447.

Foreign Trade.—(1955) Imports £665,000, exports £468,000. Production (long tons, 1954): copra 6,471; cinnamon leaf oil 99; cinnamon bark 475; patchouli leaf (dry) 67; guano (including phosphate rock) 11,864; vanilla 11,370 kg.

Sheep: see LIVESTOCK.

Shepilov, Dmitri Trofimovich (1905-), Soviet politician, was born in the Don river region, Nov. 4. In 1926 he graduated from Moscow university, joined the Communist party and was appointed public prosecutor to the Yakut A.S.S.R. From 1931 he studied at the Agrarian Pedagogical institute and was an editor in the agricultural department of the *Bolshaya Sovetskaya Entsiklopedia*. He was appointed head of the political department of a state farm in the Chulym district, western Siberia, in 1933. In 1935 he moved to the Communist party headquarters in Moscow, starting as assistant head of the agricultural section. From 1937 he

headed the agricultural section of the Soviet Academy of Sciences, receiving the next year the rank of a professor of political economy.

During 1941-45 Shepilov served with the armed forces as a political instructor and commissar. In 1946 he was appointed head of the propaganda department of the Central Political administration of the armed forces of the U.S.S.R., and following that he returned to the party headquarters as deputy director of the "Agit-prop" (Agitation and Propaganda) department, becoming director in 1949. In 1950 and 1954 he was elected to the supreme soviet, and in Dec. 1952 he was appointed editor of *Pravda*, the chief party organ, having been elected a member of the party's central committee at the 19th congress in October. In July 1955 he was appointed one of the secretaries. At the 20th congress (Feb. 1956) he was re-elected to the central committee and was made a candidate member of the presidium (former Politburo).

On June 1, 1956, Shepilov's appointment as minister of foreign affairs was announced in Moscow. In August he represented the U.S.S.R. at the London conference on the Suez canal problem. In November he was in New York, attending the meetings of the UN general assembly.

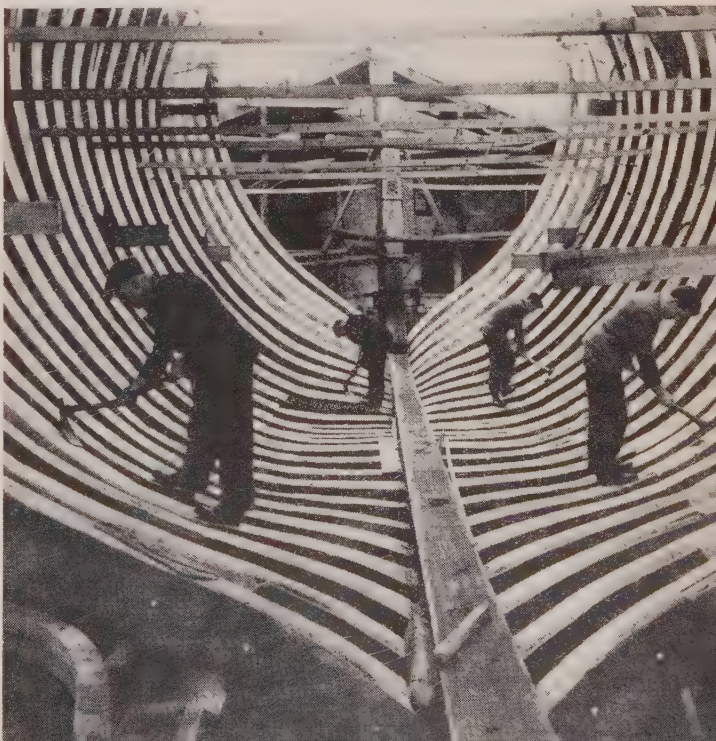
Shipbuilding. The total world tonnage under construction or on order (of vessels of 1,000 gross tons or over) as of July 1, 1956, was about 70% above the July 1955 total. The figures shown in the table, released by the Shipbuilders Council of America, do not include construction in the U.S.S.R. or satellite countries.

The world shipbuilding gross tonnage of 21,612,409 was an increase of 9,015,875 gross tons over July 1955. Practically all countries increased the amount of tonnage under construction or on order. Only India and Ireland experienced slight decreases.

United States.—The total number of ships under construction had greatly increased, while the United States position in world shipbuilding had not materially changed. In each of several European shipyards there were more ships under construction than in all the shipyards of the United States.

On Jan. 1, 1956, 25 merchant vessels (1,000 gross tons and

"MAYFLOWER" REPLICA UNDER CONSTRUCTION at Brixham, Eng. An exact replica of the Pilgrim ship was being built in 1956 for a voyage across the Atlantic to the U.S. A crew of 21 men, in 17th-century period costume, would man the ship on its voyage. After arriving, the ship was to be given to the U.S. by Great Britain. The adzes being used to fashion the ribs of the hull in the photograph are replicas of the tools used in building the original ship



Merchant Shipbuilding in Principal Countries of the World, July 1, 1956

New Construction in Hand or on Order
(1,000 gross tons and over)

Country of Building	Number of Vessels	Gross Tons	% of Total Gross Tons
Great Britain	483	4,778,889	22.1
Japan	259	3,978,295	18.4
Germany	357	3,229,201	14.9
Sweden	195	2,172,700	10.0
Holland	175	1,755,362	8.1
France	123	1,388,250	6.4
Italy	99	1,208,880	5.6
Norway	106	992,760	4.6
United States	36	565,360	2.6
Denmark	65	485,190	2.2
Belgium	37	413,550	1.9
Spain	29	226,106	1.0
Yugoslavia	33	195,500	.9
Australia	11	76,000	.4
East Germany	8	38,000	.2
India	7	33,960	.2
Canada	6	27,466	.1
Finland	6	26,640	.1
Hong Kong	4	13,800	.1
Turkey	1	4,500	.1
Republic of Ireland	1	2,000	.1
Total	2,041	21,612,409	100.0

over) aggregating 312,460 gross tons were on order, under construction or awaiting delivery in privately owned United States shipbuilding yards. This total consisted of 2 passenger-cargo vessels, 14 tankers, 4 cargo vessels, 2 ore carriers, 1 roll-on roll-off vessel, 1 passenger-auto ferry and 1 new cargo vessel undergoing conversion and completion as an auxiliary cargo attack vessel for the navy.

During the first nine months of 1956, contracts for 25 new vessels were awarded, comprising 1 ore carrier, 2 passenger-cargo vessels and 22 tankers, totalling 500,700 gross tons. During the same period six vessels were delivered. They included four tankers, one ore carrier, and one auxiliary cargo attack for the navy, totalling 86,642 gross tons, and during the same period, eight vessels were launched, consisting of one passenger-auto ferry and seven tankers, totalling 111,700 gross tons. In the same months of 1955 there had been three vessels launched and eight delivered. Of the 25 vessels ordered during 1956, 22 were tankers aggregating approximately 456,700 gross tons, all for private account except one being built for the Maritime administration. One ore carrier was being built for private account for service on the Great Lakes and the two combination passenger-cargo vessels were being built for Caribbean and South American service.

Bureau of labour statistics figures showed that there were 98,200 persons employed in construction and repair work in private U.S. shipyards as of Jan. 1955. In Jan. 1956 employment had increased to 98,900 and as of July had increased to 109,800. The average hourly earnings in the shipbuilding and repairing industry, according to the bureau of labour statistics, during June 1956, were \$2.22 as compared with \$2.09 in 1955. The average weekly hours worked also were more in 1956 than 1955, 40.2 compared with 39.8.

Because no new orders for seagoing commercial vessels were received during all of 1953, 7 during 1954 and 18 in 1955, plus 25 in the first nine months of 1956, the amount of new work had not been sufficient or had not arrived in time to provide continuity of work in the shipyards. The yards had maintained employment primarily because of the naval program of construction beginning in 1954. The contracts let by the navy department during the first nine months of 1956 totalled approximately \$260,000,000.

The fiscal 1957 navy construction program proposed the construction of 23 combat vessels, ranging in size from an attack aircraft carrier to destroyer escorts, as well as a great many small service craft.

Construction orders for nonpropelled craft, such as barges, scows and carfloats, during the first eight months of 1956 was reported at 409,965 gross tons, compared with 315,875 for the

same period of 1955. Construction of self-propelled small craft such as towboats, tugs and trawlers also increased from a total of 20,405 gross tons for the first eight months of 1955 to 34,145 gross tons for the first eight months of 1956. (H. G. S.)

Great Britain and Other Countries.—The major maritime disaster of 1956 was undoubtedly the collision in the Atlantic more than 100 mi. from New York of the Italian passenger liner "Andrea Doria" (29,083 tons gross) and the Swedish passenger liner "Stockholm" (12,165 tons gross), both built since World War II. The collision occurred in foggy conditions, although both ships were equipped with radar and had sighted each other on the radar screens at a distance of about 10 mi. Fortunately the loss of life (amounting to less than 50 persons) was comparatively small, and the Italian ship did not sink until about 11 hr. after the collision.

The spate of ordering of new ships throughout the world, which started in 1955, continued in 1956. The majority of the new orders, particularly those for large dry-cargo ships, ore carriers and very large tankers, went to Japanese, German, French, Scandinavian and Italian shipyards, and by the middle of 1956 it was estimated that the order book of the shipbuilding industry throughout the world had reached the unprecedented peacetime total of 23,000,000 tons deadweight, or about 16,000,000 tons gross. Although the majority of the new orders placed during the year went to shipyards outside the United Kingdom, and despite the fact that U.K. shipyards at the beginning of the year had enough orders to keep them fully occupied almost until 1960 at full capacity, orders placed with U.K. shipyards in the 12 months up to June 30, 1956, amounted to 2,560,000 tons gross, and the total U.K. order book at that date amounted to 5,242,000 tons gross. In the second half of the year British shipyards received orders for at least six large passenger liners totalling nearly 200,000 tons gross.

The pressure of demand for new tonnage enabled the less competitive countries to fill their order books to such an extent that they in their turn were unable any longer to offer the advantages of earlier delivery or fixed prices which at one time had put them in an advantageous position.

Japanese, and to a lesser extent German, shipyards were able to increase their output in 1956 to an exceptional extent. In the first six months of the year Japan had actually launched about 70,000 tons more and started work on about 265,000 tons gross more than the United Kingdom. U.K. shipyards, on the other hand, had been subjected to a series of prolonged labour disputes and strikes which held up work on some ships for as long as six months. They also experienced difficulties over steel supplies, which later also affected their main competitors.

All the principal passenger liners completed came from British shipyards. They included the Canadian Pacific liner "Empress of Britain" (25,516 tons gross), the Pacific Steam Navigation company's "Regina del Mar" (20,225 tons), the Cunard liner "Carinthia" (21,947 tons), the Norwegian liner "Bergensfjord" (18,739 tons)—which included the largest all-welded aluminum structure yet built, amounting to more than 400 tons in weight—and the British troopship "Nevasa" (20,527 tons). All these vessels were turbine steamships equipped with antirolling stabilizing fins. A Japanese shipyard controlled by U.S. interests launched the largest tanker in the world, the "Universe Leader," a vessel of 84,700 tons deadweight with an over-all length of 851 ft., a beam of 125 ft. and a draught of 46 ft. The largest tanker in service was the "Spyros Niarchos" (47,750 tons d.w.), completed in the spring by Vickers-Armstrongs, Ltd., who also launched a sister ship. A British shipyard (Cammell Laird) also completed the largest bauxite carrier in service, the "Leader" (33,000 tons d.w.), for a U.S. company although the completion of this ship was delayed for six months by a labour dispute.

Shipbuilding and engineering wages in the United Kingdom were advanced by about 8% and steel prices by about 5%. These increases resulted in an average increase in shipbuilding prices of about 11%. By comparison, however, with overseas yards, U.K. prices at the end of the year were still competitive.

(P. Dr.)

Shipping, Merchant Marine: see MERCHANT MARINE.

Shockley, William Bradford (1910–), U.S. physicist and co-winner of the 1956 Nobel prize in physics with John Bardeen and Walter H. Brattain (*qq.v.*). The prize was awarded to the trio for developing the transistor in the Bell Telephone laboratories at Murray Hill, N.J.; they shared a cash prize of \$38,633 announced by the Nobel committee at Stockholm, Swed., on Nov. 1, 1956.

Shockley, born at London, Eng., on Feb. 13, 1910, graduated from the California Institute of Technology in 1932 and took his Ph.D. from the Massachusetts Institute of Technology in 1936. In the latter year he joined the staff of the Bell laboratories, becoming director of the laboratories' transistor physics department in 1953.

During World War II he was a director of research in anti-submarine operations for the U.S. navy. In 1954 he became director of evaluation of weapons systems research for the U.S. department of defense.

The transistor, developed jointly by the team of Shockley, Bardeen and Brattain, is a tiny semiconductor, sturdy and efficient, that came to be widely used as a substitute for vacuum tubes in radio and television sets, automatic control devices, hearing aids, computing machines and numerous other applications. Shockley was the theorist and analyst of the group. The research that led to perfection of the transistor in 1948 was undertaken after the use of radar in World War II had demonstrated the need for a clearer and fuller understanding of the nature of semiconduction in electronics.

Shoe Industry. The year 1955 was the best production year in the history of the shoe industry. There were 576,973,000 pairs of shoes produced in the U.S. compared with 523,996,000 pairs in 1954. Shoe consumption paralleled output with an estimated 570,000,000 pairs sold in 1955.

Total production figures for Jan.–Aug. 1956 amounted to 402,709,000 pairs compared with 389,694,000 pairs in the same period of 1955. Retail sales appeared to be running 3% to 5% ahead of those for 1955.

New lasts, new constructions and techniques were used during 1956 to ensure better fit, flexibility, lighter weight and softness. Innovations included molded sole constructions that brought the shoe bottoms up over the foot, making them part of the uppers; sewing the uppers to a diamond-shaped, laminated and elasticized material to attain greater flexibility; ripple soles to cushion the feet while walking and "Spring-o-Lators" to keep the backless styles on the feet.

In women's shoe styles, silhouettes, leathers, colours and heel heights played important roles, and shoes-for-the-occasion accounted for additional consumption. The continental influence of the tapered toe and high sliver heels carried over from 1955 and moved down to the popular price range. By June 1956 there

was emphasis by fashion stylists and couturiers on the revival of the 1911–12 Poiret-period clothes with all their elegance, refinements, colours and luxurious materials, with women's shoes reflecting this influence. The silhouette was longer and narrower, heels were high and slim but there was also increased interest in the lower heights, especially the Louis-shaped heel. Closed shoes were gaining in favour, particularly in pump styles. T-straps, spat and gaiter types, reminiscent of pre-World War I days, were reintroduced in their modern counterparts. Tanners kept pace with the trend and produced leathers in finishes, textures and colours that gave impetus to these styles. Satins and brocades became popular for evening shoes.

For the first time in many years, the per capita consumption of men's shoes increased, and although the increase was slight, nevertheless it was encouraging to both manufacturers and retailers. Lighter weights, slimmer silhouettes, new leathers, colours and textures accounted for greater interest on the part of men customers and reflected in increased sales.

In children's shoes, the demand continued for styles resembling adult types such as pumps and one-strap shell silhouettes, more slender toes and slightly higher heels. Boys' shoes were lighter, trimmer and more restrained in detailing, with higher-riding top lines to ensure better fit.

Casuals in men's, women's and children's categories, as well as shoes-for-the-occasion, sport or leisure, were more popular than ever.

The United States continued to lead the world in production

Table II.—World Footwear Production
(In thousands of pairs)

	1952	Per capita 1952	1954	Per capita 1954	1955	Per capita 1955
North America . . .	572,814	2.60	603,815	2.77	661,367	2.84
South America . . .	71,447	.62	75,742	.65	109,774	.90
Europe	498,081	.86	502,368	1.01	546,723	1.36
Asia and Oceania . .	100,258	.07	98,171	.06	130,984	.09
Africa	36,107	.36	37,814	.41	38,310	.42
Total	1,278,707	.57	1,317,910	.60	1,487,158	.68

of leather footwear, and from 1950 accounted for almost 40% of world shoe production.
(E. G. AN.)

Shooting. The 57th Grand American tournament was held at Vandalia, O., Aug. 17–25, 1956. The big prize of the event, the Grand American handicap, was awarded to C. W. Brown of Dayton, O., who won it in a shoot-off after tying Paul Baker of Brookville, O., and Durwood L. Baumgartner of Gallipolis, O., at 99. In the shoot-off, Brown broke 23 of 25 targets, Baker scored 22x25 and Baumgartner had 18x25. Mrs. Rhoda Wolf of Philadelphia, Pa., took the ladies' Grand American handicap with 97x100. Mrs. A. Wayda of Bensenville, Ill., was second with 95x100. Jon Cottrell of Wilmington, Del., won the junior trophy in a shoot-off with John E. Harris III of Canton, O., and Mike Lindsey, Champaign, Ill., after a three-way tie at 94. G. Williamson, Jr., of Compton, Calif., broke 93 to lead the subjunior division and Tom Frye of Maumee, O., beat A. L. Adkins of Louisville, Ky., 23–21, in a shoot-off for the professional honours after each had finished with 94. Other major winners follow:

Preliminary Handicap

Men—Shelby Edwards, Central City, Ky.
Women—Mrs. Julie Deckert, Nashotah, Wis.
Professional—A. L. Adkins, Louisville, Ky.

North American Clay Target

Men—Dan Orlich, Reno, Nev.
Women—Iva Pembroke, Phillipsburg, Kan.
Professional—Cliff Doughman, Alton, Ill.

Champion of Champions

Men—George Genereux, Saskatchewan.
Women—Mrs. Pauline Oliver, Lubbock, Tex.
Veterans—E. T. Daniell, Idalou Falls, Tex.
Women's veterans—Mrs. Gail A. Roose, Salem, O.

Table I.—Shoe Production in the United States

Pairs	1955	Jan.–Aug. 1956
Women's shoes	278,132,000	197,073,000
Men's shoes	106,107,000	75,346,000
Misses' and children's shoes	68,487,000	48,087,000
Boys' and youths' shoes	20,971,000	14,350,000
Infants' and babies' shoes	36,615,000	24,869,000
All other shoes	66,661,000	42,984,000
Total	576,973,000	402,709,000



CAMERA CONSCIOUS DOG could not resist a glance at a photographer even while chasing his quarry during the 1956 Open All-Age stake field trials at Pinehurst, N.C. The dog at the left, intent upon his business, won the stake

High Over-all

Men—Joe Hiestand, Hillsboro, O.
Women—Iva Pembridge
Junior—George Williamson, Jr., Compton, Calif.
Professional—Tom Frye, Maumee, O.

Doubles

Men—Ned Lilly, Stanton, Mich.
Women—Mrs. Pauline Oliver
Professional—Homer Clark, Jr., Alton, Ill.

All-Around

Men—Dan Orlich
Women—Iva Pembridge

Subsmall gauge—E. C. Calhoun, Salisbury, Md.
Veterans' all gauge—A. C. Weaver, Seattle, Wash.
Senior all gauge—Carl Stutzman, Peoria, Ill.
Champion of champions all gauge—K. L. Pendergras, Jacksonville, Fla.
Collegiate all gauge—Jack Horner
Industry all gauge and all around—Fred Missildine, Sea Island, Ga.
Two-man all gauge—Jack Horner and Judy Allen, Oakland, Calif.
Husband-wife all gauge—Mr. and Mrs. Leon Mandel, Chicago
Women's all around, all gauge and 20 gauge—Mrs. Mandel
Women's small gauge—Judy Allen

Rifle and Pistol Shooting.—Competition for United States laurels with both weapons was held at Camp Perry, O., in August and September. Among the pistol winners was Master Sergeant Huelet Benner, coach at the U.S. Military academy, West Point, N.Y., who scored 2,610 out of a possible 2,700 to win his fifth national title. In the team rifle contests, the marine corps had four units finish among the first five; the army gained third place. Other major winners were:

Marine corps, individual trophy—Staff Sergeant V. Mitchell, Santa Paula, Calif.
Marine corps, Leach cup—Warrant Officer C. Gebhardt, Santa Rosa, Calif.
U.S. army sporting rifle—Sergeant L. Crow, Carrollton, Mass.
Small bore—J. K. Johnson, Washington, Pa.

(See also OLYMPIC GAMES.)

(T. V. H.)

Shows. This article covers horse and dog shows, livestock exhibitions and such travelling shows as circuses, carnivals, ice skating revues and rodeos. For musical and dramatic events of 1956, see the articles DANCE; MOTION PICTURES; MUSIC; and THEATRE. (See also FAIRS AND EXHIBITIONS.)

Horse Shows.—The two leading horse shows of 1956 in the United States were the International Horse show, daily entertainment feature of the International Live Stock Exposition and Horse show in Chicago, Ill., Nov. 23–Dec. 1, and the American Royal Livestock and Horse show in Kansas City, Mo., Oct. 20–27. Both are regarded as outstanding events in the quality and number of gaited horses, harness horses and ponies, and hunters and jumpers. New and more hazardous jumping courses featured at the Chicago show were praised by participants and followers of this old and spectacular sport.

Quarter horses, rapidly gaining in popularity for pleasure purposes, were emphasized at the National Western Stock show in Denver, Colo., Jan. 13–21, 1956; at the Southwestern Exposition and Fat Stock show in Ft. Worth, Tex., Jan. 27–Feb. 5; and at the International Dairy show in Chicago, Oct. 6–13.

The Kentucky State fair is perennially one of the leading saddle horse shows in the U.S. It was held in 1956 for the first time at the new Kentucky State fair grounds at Louisville. Large competitions of hunters and jumpers were featured at the National Horse show in Madison Square Garden, New York city, Oct. 30–Nov. 6, and at the Royal Agricultural Winter fair, Nov. 9–17 in Toronto, Ont.

National Amateur Trapshooting.—Walt Ostrom of Orangeburg, N.Y., won the national singles championship in the 1956 tourney at the Travers Island, N.Y., traps of the New York Athletic club. Ostrom triumphed by breaking 75 consecutive targets in the third extra round after finishing the regulation 200-target test in a triple tie with Harry Whitford, Mountain View, N.J., and Clarence Ziegler, Vernfield, Pa., at 198. In the first shoot-off (25), each had a perfect round. Whitford missed on his 37th shot as Ostrom and Ziegler completed their second 25 shots without error. Ziegler was wide of his 51st disk and Ostrom ran out his string to win. Other champions included Nick Egan, Flushing, N.Y., junior; J. J. McHale, Sr., London, Ont., senior; Mrs. Ken Hard, Brookhaven, N.Y., women; Harry Whitford, handicap; Roy Cole, Hamilton, Ont., men's over-all; M. D. Clark, Woodbury, Conn., doubles; W. J. Oliver and Tom Oliver, Niagara Falls, N.Y., immediate family pairs.

National Skeet Shooting.—Mrs. Leon Mandel of Chicago, Ill., set a women's world mark at Detroit, Mich., on May 20 when she knocked down 150 targets with a 12-gauge shotgun for a string of 529 hits without a miss. She later added to her perfect shooting to bring the record up to 610. In January Mrs. Mandel had been named winner of the National Skeet Shooting association's four-gun award to women for 1955, when she broke 3,924 of 4,000 targets. In the national championships at Reno, Nev., in August, Jack Horner, a sophomore at the University of California, Berkeley, won open all-bore honours by breaking 425 targets in succession. At the end of the regular event the former junior champion was tied with Titus H. Harris, Jr., Galveston, Tex., and Andy Laird, Stockton, Calif., at 250x250. The trio continued even through two shoot-offs, then Laird dropped the low 8 target while Harris and Horner continued until the seventh round before Harris missed on his first try. Among other major national victors were the following:

All-around—Titus H. Harris, Jr., Galveston, Tex.
Western open—Jack Horner, San Francisco, Calif.
Eastern open—Jack Horner
20 gauge—Louis Gordon, Texarkana, Ark.
Small gauge—C. J. Crites, Detroit, Mich.

Other prominent horse shows of the year were featured at the Harrisburg, Pa., show; the Devon Horse show, Devon, Pa.; and those held at the Indiana, Illinois, Minnesota, Missouri, Ohio and Wisconsin state fairs.

Livestock Shows.—The National Western Stock show at Denver, Jan. 13–21, was the first of the country's annual livestock shows in 1956. It included the nation's largest exhibition and sale of Hereford cattle and quarter horses.

The Southwestern Exposition and Fat Stock show at Ft. Worth followed shortly thereafter, Jan. 27–Feb. 5. The Ft. Worth show featured a large exhibition of pure-bred Brahman cattle, a breed gaining rapidly in popularity in the south and southwest for crossing purposes with the English beef breeds. This show also included large showings of the English beef breeds—Aberdeen-Angus, Herefords and Shorthorns. It is the country's oldest livestock exhibition.

The Houston Fat Stock show, Feb. 22–March 4, was also a major competition of the established beef breeds, as well as Brahmans. Both the Ft. Worth show and that at Houston featured championship rodeos as daily entertainment.

Major livestock competitions were prominent features at the midwest state fairs, starting in mid-August. They were preceded by county fairs during July and early August. Winners of county fairs usually go on for further competition at the state fairs. Among the largest livestock exhibitions of 1956 were those of the Illinois, Indiana, Ohio, Iowa, Missouri, Minnesota and Wisconsin state fairs.

Largest in point of attendance, varied features and area is the state fair of Texas at Dallas, which in 1956 was held Oct. 6–21. This event attracted many Latin-American visitors.

The dairy breeds were high lighted at the National Dairy Cattle congress at Waterloo, Ia., Sept. 29–Oct. 6, and the week following, Oct. 6–13, at the fourth annual International Dairy show in Chicago's International Amphitheatre. The Chicago show revived the long-established National Dairy show that was first held there in 1906 and continued up to 1920, after which it became an itinerant event held in many different cities. The 1956 International Dairy show attracted the year's largest total showing of the dairy breeds and included the national show of Jerseys. Considerable Canadian participation made it international in scope as well as in name. A championship rodeo was a daily entertainment feature.

Earliest of a series of livestock exhibitions, which follow soon after the state fairs, was the Eastern States exposition, in Springfield, Mass., Sept. 15–23. It is New England's largest annual farm show and is particularly strong in its exhibitions of dairy cattle.

The Ak-Sar-Ben Livestock show in Omaha, Neb., Sept. 21–30, featured beef breeds and rodeo entertainment, as did the Grand National Live Stock exposition in San Francisco's Cow Palace, Nov. 2–11.

An eastern show of growing importance was the Eastern National Live Stock show at Timonium, Md., which was held Nov. 10–16. It emphasized displays of pure-bred Aberdeen-Angus and Hereford cattle, exhibited by eastern breeders.

The American Royal Livestock and Horse show was held in Kansas City, Oct. 20–27. It is one of the country's longest-

established livestock events and ranks as a major exhibition of the beef breeds. Its horse show is among the nation's foremost.

The show year was brought to a close at Chicago with the International Live Stock Exposition and Horse show, which exceeded all other shows of the year in number of livestock entries. The 57th annual show was held Nov. 23–Dec. 1. It occupied the International Amphitheatre, whose newly expanded facilities made it the nation's largest exhibition building used for livestock exhibits and competitions. The International Horse show is regarded as the country's finest.

The Chicago Stock Yards was the setting of the largest feeder cattle show and sale of the year, Oct. 25–27, when the 12th annual Chicago Feeder Cattle show and sale attracted a record entry of 826 carloads (20 animals to the car) of western-produced calves, yearlings and two-year-olds. These were sold at auction to corn-belt and eastern feeders for \$1,585,669 to convert into finished fat cattle for the 1957 markets.

The two principal livestock exhibitions of Canada are the Royal Agricultural Winter fair, held in 1956 during Nov. 9–17, and the Canadian National exhibition, held Aug. 24–Sept. 8, both in Toronto. The winter fair is among the world's leading exhibitions of pure-bred livestock and farm products.

The historic Smithfield show was held in London, Eng., in early Dec. 1956. It is more than a century old and features meat-animal competition.

The oldest-established stock show in the world is the Highland show of Scotland. Its 117th anniversary showing took place in June 1956, followed by the 108th annual British Royal show in early July under sponsorship of the Royal Agricultural society. (W. E. O.)

Dog Shows.—The high level of dog show activity which had characterized this field of sports during the several preceding years continued during 1956. The number of shows for championship points totalled 725, 1 more than in 1955, but a considerable increase as compared with the 688 of 1954. Of the 1956 events, 406 were for all breeds and the remaining 319 were specialty or one breed shows.

For the first time in the history of the Westminster Kennel club, New York city, the nation's oldest show-giving dog club, a dog of the toy breed won top honours—Mrs. Bertha Smith's 6-lb. white toy poodle Champion Wilber White Swan; there were 2,560 dogs entered.

Winners in the next four largest shows, in order, were: Madi-

LAST PERFORMANCE of the Ringling Bros. and Barnum & Bailey circus under the "big top" tent at Pittsburgh, Pa., in July 1956. In the future the circus would appear only indoors at large U.S. cities



son, N.J. (Morris & Essex), 2,304 dogs—Mrs. S. K. Allman's Dalmatian Champion Roadcoach Roadster; International Kennel club, Chicago, Ill., 2,191 dogs—Mrs. Jouett Shouse's boxer Champion Barrage of Quality Hill; Westchester Kennel club show, Purchase, N.Y., 2,117 dogs—Jack H. Skelskie's six-year-old Irish setter Champion Dunguaire Bryson; Pacific Coast, Harbor Cities Kennel club, Long Beach, Calif., 1,856 dogs—Mrs. Kay Finch's Champion Crown Crest Zardonx.

Field trials continued to hold their popularity. Official national champions were as follows: bird dogs (setters, pointers)—James Hinton's male pointer Palamonium, Grand Junction, Tenn., trial; cocker spaniel—Tom Clute's buff American cocker Prince Tom III; Brittany spaniels—Leroy Magnuson's Jeffrey of Argard; Springer spaniels—Armforth Kennels' Micklewood Scud; retrievers—Wm. T. Cline's Labrador Massie's Sassy Boots.

Obedience trials in competition for the degrees of companion dog, companion dog excellent, utility dog and trailing dog numbered approximately 400. There were several perfect performances of 200 score.

Popularity of breeds during 1956 as indicated by registrations in the stud book of the American Kennel club, 113 breeds, were, approximately in order: beagle, leader for the last four years; Chihuahua, the diminutive Mexican toy breed; boxer; dachshund; German shepherd dog; American cocker spaniel; poodle; collie. These were followed closely by the Boston terrier, Pekingese, Pomeranian, fox terrier, Labrador and Weimaraner.

(W. JU.)

Circuses, Carnivals, Rodeos and Other Travelling Shows.—For outdoor shows in general, 1956 was a highly successful year, except for circuses. Four prominent circuses, headed by the huge Ringling Bros. and Barnum & Bailey circus, suspended operations in mid-season. Union trouble developed for the Ringling Bros. and Barnum & Bailey show when John Ringling North, who controlled 51% of the stock, refused to unionize the circus performers. The American Guild of Variety Artists posted pickets at every stand. The show closed in Pittsburgh, Pa., and North announced that "the tented circus is through" and that in 1957 the show would play only in buildings. Three circuses—King Bros., Clyde Beatty and Arnold Maley—went bankrupt and closed halfway through the season.

The Clyde Beatty show was reorganized and reopened in Arizona on Aug. 30, after which it played to large crowds for the remainder of the season. Approximately 25 circuses travelling by truck had an excellent season, refuting the charge that the tented circus was dead.

Four small circuses in Mexico enjoyed profitable business. They were Circus Union, Circo Vasquez, Circo National and Osario Circus. One show, Circo Muerte, had poor business.

In Europe, most circuses, nearly all of which travelled by truck, had a good season.

Carnivals, of which there were more than 250 on the road in 1956, had a generally profitable season. Dates at state and county fairs accounted for their biggest weeks and overcame losses suffered in early spring because of unfavourable weather. Only eight carnivals were railroad shows; the others travelled by trucks. Topping all others in size and receipts, as it had for many years, was the Royal American shows, which played the larger western Canada exhibitions and leading state fairs of the U.S. midwest and south.

In terms of operating units, the Gooding shows topped all others, with ten separate shows operating in the central and southern states. The Gooding firm was the oldest carnival organization in America, having been organized about 75 years.

Rodeos increased in number. More than 250 were held in 1956, most of them one-day affairs but many running four or five days or longer. The well-known Cheyenne (Wyo.) Frontier days drew

an attendance of 125,000 in seven days and brought an estimated \$3,000,000 to Cheyenne. The Diamond Spur rodeo, in Spokane, Wash., drew 44,000 in four performances, with Gene Autry and Gail (Annie Oakley) Davis as feature attractions. Rodeos were concentrated in the western and southwestern states. Early listings in the *Billboard* gave Oregon the lead with 23 rodeos, followed by California with 22, Idaho 15, Colorado 14, Texas 14, Oklahoma 10, Montana 7, Utah, Nebraska and Kansas 6 each, Wyoming and New Mexico 5 each and 11 other states 1 to 4 each. The World's Championship rodeo in New York city and the International rodeo in Chicago, Ill., both held in late fall, drew large crowds. The Lone Star Ranch rodeo, organized in Houston, Tex., by Bob Estes, made a European tour early in 1956, opening at the Palais des Sports, outside Paris, then playing other French locations for 12 weeks and four one-week dates in Spanish bull rings. The show was a novelty to Europeans and was very successful.

"Hillbilly" shows on the road continued to increase. Most of them featured stars made famous on radio stations in Chicago, Nashville, Cincinnati and Louisville. The drawing power of these travelling shows was exceptionally strong at state and county fairs, and was credited to the desire of radio listeners to see their favourites in person.

Auto thrill shows and auto racing continued to be popular. The main thrill show events continued to be auto crashes, roll-overs and crashes through flaming walls. Earl Newberry's Trans-World Daredevils, one of the largest shows, made a successful tour of Europe early in the year before starting its accustomed U.S. tour. About six auto racing outfits were on the road and were a standard attraction at the larger fairs.

(NA. G.)

Siam: see THAILAND.

Sierra Leone. A British colony and protectorate on the west coast of Africa, Sierra Leone is bounded north and east by French Guinea and southeast by Liberia. Area: colony 269 sq.mi.; protectorate 27,657 sq.mi. Pop. (1948): colony, 124,657; protectorate, 1,733,618; total (1955 est.) 2,050,000. Language: tribal dialects, Hausa. Religion: protectorate, pagan with Moslem minority; colony, mainly Christian. Chief towns (pop., 1952 est.): Freetown (cap.), 64,500; Bo, 15,600. Governors in 1956: Sir Robert Hall and (from July 11) Maurice Dorman; chief minister, M. A. S. Margai.

History.—It was announced in Oct. 1956 that constitutional changes would be introduced incorporating a broader franchise. The legislature would be called the house of representatives and would have 14 elected members from the colony, 24 from the protectorate and 1 from the Bo urban area, as well as 12 paramount chiefs. The ex-officio members would be reduced from 7 to 4, the number of nominated members remaining at 2. These changes, after approval by the secretary of state for the colonies, were passed by the legislative council by a substantial majority. Elections were expected to take place early in 1957.

Between Oct. 1955 and March 1956 serious disturbances occurred, mainly in the northern province, following the announcement of increases in the level of local authority taxation for 1956. A commission of inquiry was appointed under Sir Herbert Cox, whose report was published at the end of September.

Licensed African digging for alluvial diamonds began in Feb. 1956. In September the government stated that since the new scheme had not completely stopped illegal dealing, the issue of a licence to a dealer would in future take into account the value of diamonds he had sold to a licensed exporter in August. The Sierra Leone Development company was to make a further geological investigation at Tonkolili before beginning a £15,000,000 development project there.

On July 11 Maurice Dorman was appointed governor in succession to Sir Robert Hall, who had resigned because of ill health. (W. H. Is.)

Education.—Schools (1954): primary 323, pupils 42,900; secondary 14, pupils 4,369; teachers' training colleges 5, students 458.
Finance and Trade.—Monetary unit: West African pound (£W.A.1=£1 sterling=U.S. \$2.80). Budget (1954-55): revenue £7,621,299, expenditure £6,863,115. Foreign trade (1955): imports £17,170,000, exports £10,300,000. Main exports: palm kernels, iron ore, diamonds, ginger.

Sikkim. An Indian-protected state, Sikkim is bounded north by Tibet, east by Bhutan, south by India and west by Nepal. Area: 2,744 sq.mi. Pop. (1951 census): 137,725, mostly Nepalese (Gurkha) but including Bhotias of Tibetan extraction (about 9%) and Lepchas or Rongpa (about 10%) of Indochinese origin. State religion: Lamaistic Buddhism, but most of the Nepalese are Hindu. Capital, Gangtok. Maharaja, Tashi Namgyal. Dewan (chief minister) in 1956, J. S. Lall.

History.—On May 9, 1956, at the Indian *lok sabha* (national assembly), Jawaharlal Nehru was asked to define the relationship between India and Sikkim. He said that to describe Sikkim as an Indian "protectorate" was misleading. That word from the past had changed in its connotation, meaning and application. Nehru added that he was not aware that any Indian was suffering from any sort of disabilities, civil or otherwise. Sadath Ali Khan, parliamentary secretary in the Indian ministry of external affairs, explained that the status of Indians in Sikkim and Sikkimese in India would be adequately protected when the Sikkim durbar promulgated a Sikkim Subjects Regulation act, which was under consideration.

Finance.—Budget (1951 est.): balanced at Rs. 2,100,000 including the fixed annual subsidy of Rs. 300,000 from India. Monetary unit = Indian rupee, valued in 1955 at 21 U.S. cents.

Silk. The production and consumption of silk in most countries of record in the world was greater in 1956 than in 1955. Significant developments in the United States, the second largest consumer, were the increased usage of douppioni, with its thick and thin effects, in both filament and spun yarns; the continued use of 30/32 and 40/44 deniers for warp stock; the broader employment of silk fibres along with wool, cotton and synthetic fibres, especially in men's wear.

During the year there was active international co-operation in the promotion of silk. In March Japan sponsored a Tokyo meeting of the International Silk association; in September the association's directors meeting in London discussed economic and technical matters, and decided on New York as the site of the Sixth International Silk congress in Oct. 1957.

Japan's Raw Silk Stabilization law successfully functioned to prevent prices from declining below the "floor" of 190,000 yen (about \$4.10) per pound by government purchases at that level; Custody corporation, a nongovernmental Japanese organization, bought silk at higher than government levels and resold to original owners within six months on market advances, reducing fluctuations; another organization provided loans for buyers of raw silk delivered on the silk exchange. New York prices ranged for 2A 20/22 warp stock from \$4.75 to \$4.25 per pound, and for 2200/250 douppioni from \$4.30 to \$3.75.

In Japan, the major producer and consumer, the cocoon crop was about 6% less than in the previous year, whereas the consumption was about 25% greater at 248,580 bales (based on nine months' figures).

Exports of Raw Silk and Douppioni from Japan
(In bales of 132 lb.)

Year	U.S.	France	Italy	Switzerland	Great Britain
1956*	62,606	8,030	6,180	1,192	2,894
1955	54,536	12,389	3,962	2,384	3180
1954	48,067	9,196	1,435	1,647	5,006

* 1956 estimated on nine months' figures. Some European countries incompletely reported.
 Sources: Central Raw Silk Association of Japan; Japan Statistical Monthly.

Japan's export of silk and silk-mixed fabrics increased about 37%, and waste silk, including all types of silk fibres, increased about 30% over 1955. South Korean douppioni use in the U.S. increased, and Italy used more Japan douppioni. China raw silk and fabrics were still prohibited by the U.S. government from entering the U.S., but pongee fabrics made from tussah silk were permitted to enter under strict control of country of origin of fabric, such as Japan; spun tussah yarn was permitted, but tussah waste silk was denied entry into U.S.

(See also TEXTILE INDUSTRY.)

(D. D. LD.)

Silver. More than a dozen countries contributed to the 1955 total world output, but most of it was produced by six countries. Table I gives data supplied by the U.S. bureau of mines.

Table I.—World Silver Production
(in 000,000 fine ounces, smelter output)

	1949	1950	1951	1952	1953	1954	1955
United States . . .	34.94	42.31	39.91	39.84	37.74	35.58	36.47
Canada	17.64	23.22	23.13	25.22	28.30	31.12	27.90
Mexico	49.45	49.14	43.80	50.35	47.87	39.90	47.96
Honduras	3.43	3.51	3.18	3.70	5.64	3.43	1.75
Argentina	1.25	1.15	1.25	0.96	0.90	1.64	1.41
Bolivia	6.66	6.56	7.14	7.07	6.11	5.05	5.85
Chile	0.80	0.95	1.19	1.42	1.50	1.49	1.71
Peru	10.61	13.37	14.96	18.39	19.65	20.42	22.98
Sweden	1.14	1.28	1.15	2.20	1.57	2.22	2.45
Belgian Congo . .	4.55	4.46	3.80	4.73	4.96	4.55	4.08
South Africa . . .	1.16	1.12	1.16	1.18	1.19	1.24	1.46
Japan	2.89	3.96	4.61	5.18	6.03	6.05	5.94
Australia	9.85	10.68	10.79	11.43	12.40	13.83	14.56
U.S.S.R. (est.) . .	24.4	24.4	24.4	24.4	25.4	25.4	25.4
Total	179.2	203.3	199.7	215.3	221.2	213.0	221.5

United States.—Second in world output, the United States produced 36,734,565 oz. or 1% less silver in 1955 than in 1954, principally because of strikes at several base-metal mines. Idaho (by far the largest producing state), Utah, Montana and Arizona supplied 84% of the total output. In the first six months of 1956 output of silver was 18,748,937 oz.

Table II.—Silver Industry in the United States
(in 000 fine ounces or of dollars)

	1950	1951	1952	1954	1955
Mine production . .	42,459	39,767	37,571	36,941	36,735
Imports	\$110,035	\$103,469	\$95,104	\$79,699	\$45,755
Exports	\$ 6,202	\$ 8,590	\$ 8,427	\$3,636	\$ 4,822
Industrial use . . .	155,257	151,651	125,389	104,629	101,400
Secondary recovery .	45,257	46,651	19,389	18,629	22,135
Net consumption . .	110,000	105,000	106,000	86,000	79,265

Canada.—In the first seven months of 1956, output of silver totalled 15,653,914 oz.

Mexico.—Output of silver by the world's leading producer in the first eight months of 1956 was 28,900,000 oz. Effective Jan. 1, 1956, the Mexican congress issued a new decree which lowered the production tax on silver. (F. E. H.; B. B. M.)

Singapore. Singapore is a British island colony off the southern end of the Malay peninsula, with Christmas Island dependency in the Indian ocean. Area: Singapore and adjacent islets 224.5 sq.mi.; Christmas Island 62 sq.mi. Pop.: Singapore Island (1947 census) 938,144, (June 1955 est.) 1,210,534, including 76% Chinese, 12% Malays, 8% Indians; Christmas Island (1947 census) 866, (1955 est.) 2,054. Capital, Singapore city, pop. (1955) 862,222. Governor: Sir Robert Black. Chief ministers in 1956: David Marshall and (from June 8) Lim Yew Hock.

The U.K. commissioner-general in southeast Asia, with responsibility for the co-ordination of policy in Malaya, Singapore, Sarawak, North Borneo and Brunei, has his headquarters in Singapore. Commissioner-general in 1956: Sir Robert Scott.

History.—Talks on a future constitution for Singapore were held in London, Eng., during April 23-May 15, 1956. The Singapore all-party delegation was led by David Marshall, the chief

minister. A. T. Lennox-Boyd, secretary of state for the colonies, headed the colonial office delegation. Although the British government was willing to concede a constitution which granted Singapore full internal self-government, with control only of external affairs and defense reserved to the crown, disagreement arose and the talks broke down over the measure of control of internal security which would follow the reservation of these powers. After the return of the delegation to Singapore, Marshall resigned and was succeeded (June 8) as chief minister by Lim Yew Hock.

There was during 1956 a steady and planned increase of activity by communist front organizations led by members of the People's Action party and various trade unions. Prominent among these was the Singapore Chinese Middle Schools Student's union, the majority of whose members were over-age. When the government ordered the dissolution of this union on account of its subversive activities, the students ordered a stay-in-strike, and when the schools were cleared by the police rioting broke out. The riots lasted three days; military assistance was called in, and casualties numbered 13 dead and about 140 injured. More than 500 arrests were made. (G. G. TN.)

Education.—(1954) Registered schools (government maintained, aided and private) 563, teachers 6,307. Pupils: primary 156,762; secondary 21,196 (including 2 junior technical schools, pupils 356, teachers 34). 1 government teachers' training college and several centres and courses; teachers in training 1,723. University of Malaya (Oct. 1954): students 1,043, teaching staff 161.

Finance.—Monetary unit: Malayan dollar, equal to 2s. 4d. sterling and Mal. \$3.053 to 3.077=U.S. \$1. Budget (1955 actual): revenue £24,091,000; expenditure £27,926,000. Foreign trade (1955): imports Mal. \$2,865,436.208; exports Mal. \$2,781,798,833 (excluding trade with the Federation

of Malaya). Main source of imports (1954): Indonesia 34.1%; U.K. and commonwealth 22.7%. Main destination of exports: Europe 19.0%; U.K. and commonwealth 28.5%. Main exports (1955): rubber 526,300 tons; tin 33,332 tons.

Shipping.—(1955) Vessels entered 18,305 (including 8,981 foreign trade ships of more than 75 tons); total tonnage 51,290,000 net; cargo handled (1955) 6,025,980 freight tons loaded; 10,433,420 freight tons unloaded.

ENCYCLOPÆDIA BRITANNICA FILMS.—Singapore (1955).

Skating: see ICE SKATING.

Skiing. Billy Woods, a 17-year-old skier from Manchester Center, Vt., won the national downhill and Alpine combined titles in the 1955-56 season. Competing in the championships at Squaw Valley, Calif., site of the 1960 Olympic winter games, on April 6-8, 1956, Woods sped down the course of 1 $\frac{7}{8}$ mi. in 1 min. 53.3 sec. Second was Redmond Wilcox of Norwich university (Northfield, Vt.), who was clocked in 1 min. 57.2 sec. Another teen-age skier, Katherine (Renie) Cox, 17, of Port Leyden, N.Y., was victor in the women's downhill and Alpine combined. As the Ridge Ski club entry, Miss Cox made the run down the 1 $\frac{3}{4}$ -mi. course in 2 min. 0.1 sec. Sally Deaver of Whitmarsh, Pa., placed second with a time of 2 min. 0.4 sec. Victors in the giant slalom at Squaw Valley were Thomas Corcoran of Westfield, N.J., and Sally Deaver. Corcoran was clocked in 2 min. 3.3 sec. for the twisting run down a 1,500-ft. slope. Billy Woods was second in 2 min. 7.1 sec. Nonie Foley of Sun Valley, Ida., was runner-up to Miss Deaver in 2 min. 21 sec.

Keith Zuehlke of Eau Claire, Wis., leaped 201 and 200 ft. for 220 points to win the national Class A jumping laurels at Westby, Wis., on Jan. 22, 1956. A crowd of 10,000 persons saw Zuehlke win after close competition with Wilbert Rasmussen of Ishpeming, Mich. Rasmussen leaped 195 and 191 ft. for 215.9 points. The Class B winner was Jerry Lewis of Duluth, Minn.

Mack Miller of the U.S. army, whose home is at McCall, Ida., won the national cross-country title and qualified for an Olympic berth at Spout Springs, Ore., on Dec. 31, 1955. A field of 26 competed. I. Vincelette of Highland Falls, N.Y., was the Class B winner.

The absence of many skiers abroad for the Olympic winter sports caused a number of major United States and North American events to be cancelled in 1956. A list of some of the important title winners for the season follows:

United States

Jumping—Keith Zuehlke, Eau Claire, Wis.
Downhill—Billy Woods, Manchester Center, Vt.
Slalom—Thomas Corcoran, Westfield, N.J.
Giant slalom—Thomas Corcoran
Alpine combined—Billy Woods
18-km. cross-country—Mack Miller, U.S. army
Women's slalom—Sally Deaver, Whitmarsh, Pa.
Women's giant slalom—Sally Deaver
Women's downhill—Katherine (Renie) Cox, Port Leyden, N.Y.
Women's Alpine combined—Katherine (Renie) Cox

U.S. Intercollegiate

Jumping—Billy Olson, Denver, Colo.
Downhill—Walter Taulbee, University of Washington
Slalom—Chiharu Igaya, Dartmouth
Cross-country—Erik Berggren, Idaho
Alpine combined—Chiharu Igaya
Nordic combined—Erik Berggren
Jumping team—Denver
Downhill team—Dartmouth
Slalom team—Denver
Cross-country team—Western (Colo.) State
Alpine team—Denver
Nordic team—Idaho
Over-all team—Denver

(See also OLYMPIC GAMES.)

(T. V. H.)

Skin Diseases: see DERMATOLOGY.

Sloan Foundation, Inc., Alfred P.: see SOCIETIES AND ASSOCIATIONS, U.S.



"FREEDOM RALLY" at Kallang airport, Singapore, in 1956. A group seeking independence of the British colony turned the gathering into a riot

Smithsonian Institution. This institution, located on the Mall in Washington, D.C., was established in 1846 through a bequest from James Smithson, an English scientist. It is governed by a board of regents, composed of the vice-president of the United States, the chief justice of the United States, three senators, three representatives and six citizens from various parts of the country. The executive officer is the secretary, who in 1956 was Leonard Carmichael. The institution has ten branches: United States National museum, Bureau of American Ethnology, Astrophysical observatory, National Collection of Fine Arts, Freer Gallery of Art, National Air museum, National Zoological park, Canal Zone Biological area, International Exchange service and National Gallery of Art (with separate board of trustees).

Plans were under way in 1956 for the new \$36,000,000 Museum of History and Technology of the Smithsonian, authorized by congress the previous year. The tentative schedule called for the completion of the building by 1960 or 1961. It would be located in Washington's Mall area between 12th and 14th Streets on Constitution avenue.

During 1956 the institution continued its scientific investigations, chiefly in the fields of anthropology, astrophysics, biology and geology. Several field expeditions were in progress in the interests of these researches, resulting in much new information and in large collections of valuable specimens.

The National museum collections were increased by slightly more than 900,000 specimens during the year, bringing the total catalogue entries to 43,756,010. The exhibits-modernization program was successfully continued, and the new Bird hall was opened to the public. Members of the museum staff conducted field work in Peru, Europe, Canada, Palau archipelago, Libya, the West Indies, Panamá and many parts of the United States.

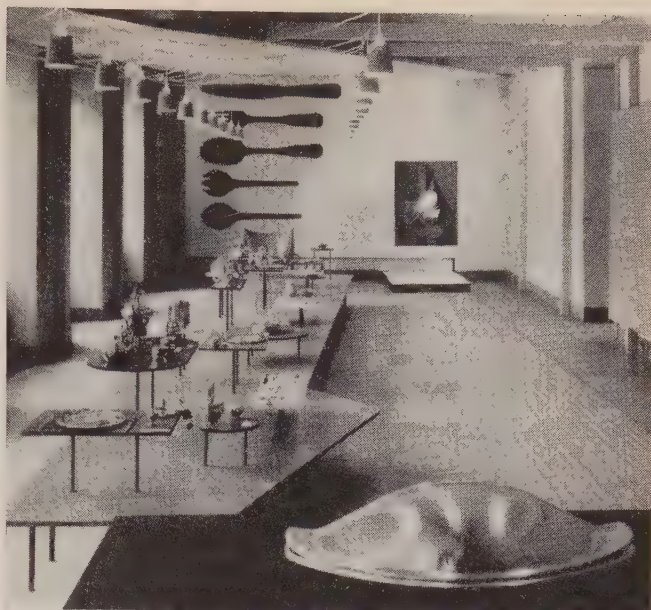
The National Gallery of Art received 477 accessions. It held 10 special exhibits. John Walker was appointed the new director of the gallery, succeeding David E. Finley, who reached retirement age. The National Collection of Fine Arts sponsored 13 special exhibits, and its travelling exhibition service circulated 68 exhibitions, chiefly in the United States. The Freer Gallery of Art acquired many choice specimens of oriental art. During 1956 the Freer gallery celebrated the centennial of the birth of its founder, Charles Lang Freer, and awarded the first Charles Lang Freer medal to Osvald Sirén, of Stockholm, Swed.

Anthropologists on the staff of the Bureau of American Ethnology continued their researches, particularly on Panaman, Mexican and arctic archaeology. The River Basin Surveys unit continued its archaeological work at sites threatened by dam and reservoir construction, particularly in the Missouri valley.

The Smithsonian Astrophysical observatory moved its scientific headquarters to Cambridge, Mass. Broadened research programs of this agency under its new director, Fred L. Whipple, included not only strictly solar research but also meteoritic studies and studies of the higher atmosphere. The observatory also participated in Project "Moonwatch," the satellite tracking program of the International Geophysical year. The division of radiation and organisms continued its research on the role of light in regulating growth in higher plants.

The National Air museum received many valuable accessions, including the first Pitcairn autogiro constructed in the U.S., a Stearman-Hammond aeroplane of the 1930s, the Curtiss Robin monoplane "Ole Miss," an original amphibious aircraft of 1909-12 and a Bell P-39 Airacobra.

The National Zoological park acquired 1,710 individual animals during the year, among which were a pair of European wisents, a rare dwarf Bolivian armadillo, an olingo from Colombia, gelada baboons and a Guianan crested eagle. In all, 252 creatures were born or hatched at the zoo during the year.



"FIFTY YEARS OF DANISH SILVER," a travelling exhibit of the Smithsonian institution in 1956. The exhibit was designed by Finn Juhl

The international exchange service handled 1,161,855 packages (weighing about 800,000 lb.) of scientific and governmental publications, serving as the United States agency for the interchange of such material with other countries.

At the Canal Zone Biological area, Barro Colorado Island, Panamá, Carl B. Koford was appointed the new resident manager, succeeding James Zetek, who retired. The year's visitors to the island totalled 440, many of whom were research scientists.

Seventy-four new publications appeared under the Smithsonian imprint during 1956. Outstanding among these were: *The Bromeliaceae of Brazil*, by Lyman B. Smith; *The Last Cruise of H.M.S. Loo*, by Mendel L. Peterson; *Chazyian and Related Brachiopods* (2 vol.), by G. Arthur Cooper; *The Honey-Guides*, by Herbert Friedmann; *The Diné: Origin Myths of the Navaho Indians*, by Aileen O'Bryan; and *Chinese Porcelains of the Ardebil Shrine*, by John A. Pope. A new series, "Smithsonian Contributions to Astrophysics," was inaugurated. The Smithsonian library, including its various branches, numbered approximately 956,000 volumes.

The year's recorded visitors to the Smithsonian buildings reached an all-time high of 8,947,066, including the main Smithsonian building, the Natural History building, the Arts and Industries building, the Aircraft building, the Freer Gallery of Art, the National Gallery of Art and the National Zoological park.

(L. CAR.)

Soaring: see GLIDING.

Soccer. The Harmorville (Pa.) Hurricanes won the national challenge cup by turning back the Schwaben eleven of Chicago, Ill., in the final play-offs for the U.S. 1956 open title. Harmorville had advanced to the ultimate round by eliminating the Brooklyn (N.Y.) Hakoah team while the Chicagoans had gained at the expense of the Los Angeles (Calif.) Danes. The Hurricanes clinched the cup on May 6 at Pittsburgh (Pa.) by halting the Schwabens, 3-1, in overtime. The Kurtis Soccer club of St. Louis, Mo., captured the national amateur cup and St. Engelbert of St. Louis took United States junior cup honours. The Philadelphia (Pa.) Uhris were champions of the American league and went on to triumph in the long competition for the Lewis cup. The Uhris and the Elizabeth (N.J.) Falcons had tied for the American league title with 10 victories, 2 losses and 4



UGANDA SOCCER TEAM practising in the waters of Lake Victoria, Br.E.Af., in Aug. 1956 before leaving for a tour of England in which they would compete against British teams in London, Liverpool and other cities. By practising in the water the team members were becoming accustomed to the insecure footing which they were advised to expect on muddy English playing fields

deadlocks each and in their play-off for the crown in New York, the Uhriks routed the Falcons, 5-1.

The Austrian national team from Vienna played an extensive schedule in a tour of the United States. Central America and South America and completed its trip with 8 victories, 7 defeats and 1 tie. Everton of Liverpool, Eng., and Aberdeen of the Scottish league visited the United States and Canada, Aberdeen winning 5, bowing in 3 and deadlocking in 1 while Everton finished with 7-1-1. The British clubs met in New York in June, with Everton scoring by 6-3 after having taken the measure of Aberdeen, 3-1, in their meeting at Toronto. The Schwaben football club of Augsburg, Ger., opposed Everton in New York on May 30 and handed the British the lone setback of their tour, 1-0.

A crowd of 42,455 at Yankee stadium in New York saw the Israeli Olympic eleven defeat the American league all-stars, 2-1, in April. Brazil took the Pan-American laurels at Mexico City in March. A crowd of 80,000 saw Brazil clinch the tourney title by playing a 2-2 tie with Argentina in the final game. The victors finished with 9 points as Argentina, with 7, placed second.

(See also FOOTBALL; OLYMPIC GAMES.)

(T. V. H.)

Socialism.

The Socialist parties of the world in 1956 geared their international policies in general to the prevention of war, the containment of world communism, the strengthening of independence movements in countries dominated by the great powers, and, in domestic affairs, to the increase in economic security and higher living standards. In the fall, Socialists denounced the use of Soviet troops in crushing the revolt in Hungary.

As in the past, the main centre of Socialist strength during the year was in Europe, where Socialists dominated the Scandinavian governments of Denmark, Norway and Sweden; led the

coalition governments of Belgium, Finland, France and the Netherlands; participated in the cabinets of Austria, Italy and Switzerland; and served as the chief opposition parties in the German Federal Republic and Great Britain.

Outside of Europe, the Socialists were controlling factors in the governments of Israel, Burma, Ceylon, Costa Rica, Puerto Rico, Jamaica and in the province of Saskatchewan in Canada. The Labour and Socialist parties of Australia, New Zealand and Japan constituted the main government opposition in those countries.

Europe.—The powerful British Labour party continued during the year as the government's chief opposition. In the spring, the party gained 325 (net) seats in the county, borough district councils and increased its proportion of votes in several parliamentary by-elections.

In Dec. 1955 the Parliamentary Labour party elected Hugh Gaitskell leader of the party, to succeed Clement R. Attlee who, after his resignation, became a member of the house of lords. The party opposed the government's policy in Cyprus and the landing of armed troops in Egypt in the Suez crisis, declaring that the sending of troops to Egypt could not be justified "except in accordance with our obligations and pledges under the charter of the United Nations."

In Sweden, where Socialists had controlled the government for many years, balloting for the lower house of the *riksdag* on Sept. 16, 1956, resulted in the election of 106 Social Democrats out of a total of 231 (a loss of 4 seats since the elections of 1952). The Social Democrats and Farmers' Union decided to continue their co-operation in a coalition cabinet headed by Tage Erlander. The Farmers' Union consented to a compromise bill on a strengthened pension system, while Social Democrats expressed their willingness to supply farmers with loans and to grant them specified forestry rights.

In Finland, the general elections in Feb. 1956, resulted in a popular vote for the Social Democrats of 23.7% of the total, as contrasted with 27.4% for the Agrarians, the largest Finnish party. Following the elections Urho Kekkonen, Agrarian, was

ected president; Karl A. Fagerholm, Social Democrat, prime minister. In Iceland eight Socialists were elected to a parliament of 52 members. The election was followed by the formation of a coalition government of the Progressive and Social Democratic parties with the Communist People's Alliance. The new government at first urged the withdrawal of U.S. troops from the North Atlantic Treaty organization (NATO) base on the island, although later expressed its willingness to permit the troops to remain under specified conditions. In Norway, the government's health insurance reform went into force. This brought into the insurance system the remaining 10% of the population and entitled all to free medical attention, medicine and hospital care.

The Socialist-Liberal coalition government of Belgium gave much attention to the problems of old-age pensions, education, housing, full employment, foreign trade and a 45-hour work week.

Following the Netherlands elections of June 13, the Dutch Labour party again emerged as the strongest party in the country. During the election campaign, Labourites urged the strengthening of NATO, a more complete economic union among the Benelux countries and the development of democratic unity on a European scale. They opposed the continuance of the denominational party system as undemocratic. After nearly four months of negotiation following the election, Willem Drees, Socialist, prime minister in the previous government, was selected prime minister. In the Jan. 2, 1956, election of members of the French national assembly, Socialists ranked third in the number of candidates elected, winning 94 seats in the assembly, as against 151 for the Communists and 96 for the Independent Republicans, Peasants and dissident Gaullists. André Le Troquer, Socialist, was selected speaker of the new French assembly and later Guy Mollet, secretary of the French Socialist party, prime minister.

During the year, Mollet obtained the passage of a proposal to increase old-age pensions. As a means of solving the Algerian problem, he urged a cease fire, to be followed within three months by free elections, negotiations with the winners of the elections on an Algerian charter and establishment of joint rule by the 8,000,000 Moslems and 1,000,000 French. The Socialist party, in its 48th national congress (June 28-July 1), urged that, without waiting for the adoption of a charter for the new Algeria, the government speed up economic, financial, political, social and administrative reforms in Algeria.

The failure of the government to bring peace to Algeria and initiate reforms therein, and the handling by Mollet of the Suez canal situation were sharply criticized by an important minority of French Socialists.

The Social Democratic party in the German Federal Republic (West Germany) remained throughout 1956 the second largest party and chief opposition to Konrad Adenauer's government. The party program included demands for cancellation of the Conscription act; revision of West Germany's commitment to NATO; the calling of a big four conference on reunification and establishment of diplomatic and trade relations with Poland, Czechoslovakia and other east European states. The party rejected any and all forms of "people's democracy" for Germany, basing its policy "on a freely elected democratic society in which no one party could establish its domination."

In the parliamentary elections of May 13 in Austria, the first since the withdrawal of the occupation forces, the Socialists received 43.3% of the votes and elected 75 representatives, seven less than the People's party (a moderate Catholic party). During the campaign, the Social Democrats urged that former German property which had been handed over to the state under the Austrian state treaty, consisting of oil wells and several hundred factories, be operated by the government with fair compensation to be given to former owners. They also urged public own-

ership and operation of aviation and favoured Austria's joining the Council of Europe.

Throughout 1956 the two branches of the Italian socialist movement, led by Pietro Nenni and Giuseppe Saragat, deputy prime minister, conferred on the question of reuniting the two parties, separated since 1947. Saragat's party declared that both factions before uniting should pledge themselves to democratic control of the united party and to a policy of co-operation with the democratic countries of the west and should reject all forms of the popular front.

The Socialist Union of Central Eastern Europe, containing representatives of Social Democratic parties in exile in ten central-eastern countries, issued a bulletin, "Labour's Call From Behind the Iron Curtain," from its headquarters in London. The bulletin sought to enlighten the western countries on what was going on back of the iron curtain, and to enlist the political and moral support of Socialists against Soviet Communist domination. The union held a special meeting in Strasbourg, Ger., on April 12-14.

In Israel, a coalition cabinet of labour parties, led by Prime Minister David Ben-Gurion of the Mapai or Democratic Socialist party, controlled the government during 1956. In midyear Moshe Sharett, former prime minister, resigned from the office of foreign minister and Golda Myerson, minister of labour, was appointed his successor. In the latter part of the year the government was chiefly occupied with the clash between Israel and Egypt.

Far East.—The recently united Socialist party of Japan elected 80 members to the house of councillors on July 8. These constituted 32% of the total. The party's pre-election strength was 68 house members. Socialists during the year opposed Japanese rearmament and the proposal to strike from the constitution article 9, which renounces war as an instrument of national policy; condemned the retention by the U.S.S.R. of the former Japanese islands in the North Pacific; and fought for continued decentralization of the control of Japanese schools.

The Praja-Socialist party of India remained critical during the year of many of the policies of the Congress party. In late November, following the vote of Krishna Menon, India's delegate to the United Nations, against the resolution calling for the withdrawal of Soviet troops from Hungary and the holding of United Nations' sponsored elections in that country, the leaders of the Socialist party, Jayaprakash Narayan and Ashoka Mehta, denounced the government for Menon's stand. The party during the year refused the Indian communists' offers of united action.

In Burma, the Anti-Fascist Freedom league (A.F.P.F.L.), controlled by democratic Socialists, obtained 47.9% of the popular vote cast for members of the house of deputies in the elections held on April 27, 1956, and pro-A.F.P.F.L. organizations received 7.3%. The A.F.P.F.L. captured 70% of the legislative seats, a small decrease from 1951. On June 5, Premier Nu, Socialist, after eight years of service, turned over his post for one year to Defense Minister Ba Swe to devote his full energies to strengthening the A.F.P.F.L.

The April 1956 election in Ceylon resulted in a victory for the People's United Front, under the leadership of S. W. R. D. Bandaranaike, member of the Social Democratic party (Sri Lanka Freedom party). Following the elections, Bandaranaike was elected prime minister. The new government urged complete independence for Ceylon.

On Feb. 28 the Socialist party of south Vietnam decided to merge with four other parties into the Congress bloc to fight the Diem government dictatorship. The opposition parties in the ensuing campaign were denied freedom of assembly and press and were defeated by the government party.

The Indonesian Socialist party, an opposition party, denounced

during the year those in the country who were attempting to divide the population into native and nonnative Indonesians, and urged a reduction in the influence of foreign capital in Indonesia.

Asian Socialists held a conference in the fall in Bombay, India, and passed numerous resolutions favouring democratic socialist goals and condemning communist aggression and colonialism of all types.

North and South America.—In the elections of June 20, 1956, in Saskatchewan, Can., the Co-operative Commonwealth Federation (C.C.F.) government was elected to its fourth consecutive term, winning 36 seats in the new legislation to 14 for the Liberals and 3 for the Social Credit party. The C.C.F. vote totalled about 45% of the total popular vote, as against 54% in 1952. At its annual conference in Winnipeg, Man., in early August the C.C.F. adopted a new declaration of principles, known as the Winnipeg declaration. This declaration set forth as the aim of the party "the establishment in Canada by democratic means of a cooperative commonwealth in which the supplying of human needs and enrichment of human life shall be the primary purpose of our society." In October the party opposed the use of force in the Suez canal crisis and declared that a solution should be sought through the United Nations.

In the United States the Socialist party at its 1956 convention nominated Darlington Hoopes and Samuel H. Friedman as candidates for president and vice-president respectively, and they were on the ballot in 10 states. The party platform urged the ownership and control "of public utilities, basic industries, banks, and insurance companies either by genuine co-operatives or by publicly owned and democratically managed corporations."

The Socialist parties of Argentina and Uruguay and the Partido Socialista Popular of Chile met in Montevideo, Ur., on May 11-13, 1956, and agreed to establish the Consultative Committee of the Latin American Secretariat of the Socialist International, for the exchange of information among Socialist parties and the promotion of closer contacts between the Socialist parties of Latin America. In Puerto Rico the popular Democratic party, with a socialistic program, led by Gov. Luiz Muñoz Marín, won a fifth consecutive election victory on Nov. 6. The party urged the maintenance of the island's commonwealth status for an indefinite period and opposed complete independence from the United States.

The Socialist party of Argentina, in its June 27-July 1 congress, reaffirmed its stand against co-operation with the Communist party, repudiated the forces favouring colonialism and imperialist exploitation of the peoples of Asia, Africa and Latin America, and urged the creation of a united Europe and universal disarmament.

Socialist International.—Forty-six delegates from 17 European countries plus Israel and Canada met in a council meeting of the Socialist International in March 1956, in Zürich, Switz. The council rejected the renewed proposals of the Communists to co-operate in a combined working class, declaring that the Communist attitude toward dictatorship showed little change since before the anti-Stalinist drive. The council urged progressive controlled disarmament as the world's most urgent problem; criticized the west for "attempting to appease the Arabs," and favoured the proposal to supply Israel with the necessary arms for self-defense.

(See also DEMOCRACY.)

(H. W. L.; N. T.)

Socialist Soviet Republics: see UNION OF SOVIET SOCIALIST REPUBLICS.

Social Security. There was considerable activity in the field of social security during 1956, as a

few countries passed new laws and some, like the United States, revised their laws governing programs already set up.

Some countries modified their retirement or pension programs. Large benefit increases took effect in Finland, France, Great Britain and the Soviet Union. A Netherlands temporary old-age assistance act of 1947 was replaced by a universal pension law, and Belgium adopted a new act for its wage earners' retirement plan. In Spain general wage increases were accompanied by reduced employer social insurance contributions. Nicaragua adopted a comprehensive social security law.

United States.—Legislative activity in the field of social security was extensive in 1956. Congress enacted amendments to the Social Security act, liberalized benefits under the Railroad Retirement act and the Civil Service Retirement act, and passed a law making changes in military survivor benefits.

Private employee benefits continued to play an important role in industry. Health and welfare provisions were included in at least half the collective bargaining agreements between management and labour in the first six months of 1956, and pension provisions in more than one-third. The subcommittee on welfare and pension funds of the senate committee on labor and public welfare completed its investigation of these funds and proposed legislation to protect the interest of the employees covered. Several bills were introduced in congress calling for disclosure of certain details of the operation of private employee-benefit plans.

The Social Security amendments of 1956, signed Aug. 1, 1956, made major changes in the old-age and survivors insurance program and amended the public assistance, the child welfare and general titles of the Social Security act. The amendments also authorized, for the first time, federal grants to states and public and nonprofit organizations for co-operative research or demonstration projects relating to the prevention or reduction of dependency. No funds were appropriated for this purpose for the fiscal year ending June 1957.

Social Insurance and Related Programs.—The federal old-age and survivors insurance program, administered by the Social Security administration of the department of health, education and welfare, provides monthly benefits related to previous earnings to insured workers and self-employed persons upon retirement at age 65 or later (except for women workers as provided by the 1956 amendments) and supplementary benefits to their dependent children (under age 18 or, if older, with total disability that began before that age); to their wives if aged or having entitled children in their care; and to the dependent, aged husbands of women workers. The program also pays monthly benefits to the following survivors of deceased insured workers: widows or dependent aged widowers, dependent children (as defined above), or the dependent aged parents. A lump-sum death payment of not more than \$255 is also made on the death of every insured worker.

The 1956 amendments provided a new type of monthly payments—disability insurance benefits, payable to insured workers (but not their dependents) between the ages of 50 and 65, and computed at the same rate as the old-age benefit. To be eligible for these benefits, the disabled worker must be determined to be disabled under the definition of disability used in applying the disability "freeze" provision in the 1954 act, meet the age requirements, be fully and currently insured, and have 20 quarters of coverage in the 40-quarter period ending with the first quarter of his period of disability. A six-month waiting period is required after onset of the disability before benefits are payable. July 1957 was set as the first month for which these benefits were payable.

The disability "freeze" provision permits persons meeting specified conditions to omit periods of prolonged disability oc-

curring before age 65 in computing their average earnings. The rules and standards for this provision remained in effect. The freeze can be established for a disabled person before he is 50 years old and if he is still disabled at that time he may apply for and, if qualified, receive the cash disability benefits. Applicants for the freeze and for the disability benefits are referred to the state agency for vocational rehabilitation, and monthly benefits are suspended if a beneficiary refuses to accept rehabilitative services without good cause.

The amendments also provided that, beginning in Jan. 1957, child's benefits are payable for children aged 18 and over who were totally disabled before age 18. When the insured parent of such a dependent child dies or becomes entitled to old-age benefits, the disabled child's benefits may begin regardless of his age and continue as long as he is disabled. Determinations of disability are made in the same way as for disabled workers, and, similarly, benefits will be suspended for refusal to accept rehabilitative services. Mother's (or wife's) benefits are also payable to a mother who has in her care any child entitled to such benefits.

The 1956 law made it possible for women to qualify for benefits at age 62 instead of 65. Effective Nov. 1956, women eligible for benefits as widows or dependent parents or as wives with child beneficiaries in their care receive full benefits at age 62. Retired women workers and wives without entitled children in their care who choose to start receiving their benefits between the ages of 62 and 65 will receive a smaller benefit than they would otherwise get at 65. The benefit reduction is greater for the wife beneficiary than for the retired woman worker, and in each case depends on the number of months before age 65 that the benefit is being received. The reduced benefit is also the amount that will be received after age 65, except that adjustment to take account of any months for which the woman may have her benefit suspended may make it higher, or the woman may later become entitled to a full widow's benefit.

The Social Security amendments of 1956 added about 900,000 persons to the number already covered by old-age and survivors insurance—chiefly additional farmers and members of self-employed professional groups previously excluded (except doctors of medicine). The Servicemen's and Veterans' Survivor Benefits act extended coverage under the program effective Jan. 1957 to about 3,000,000 members of the uniformed services (the armed forces and commissioned officers of the U.S. public health service and the coast and geodetic survey) on a contributory basis. Still excluded were doctors of medicine, most federal civilian employees under a retirement system and, in general, policemen and firemen covered by a state or local government retirement system.

The program is financed by contributions from employers and employees and from the self-employed based on their taxable earnings (up to \$4,200 a year). The 1956 amendments, to finance the new disability benefits, raised the tax rate $\frac{1}{4}$ of 1% for employees and employers and $\frac{3}{8}$ of 1% for the self-employed. The employer-employee rate was 2% each in 1956; it was raised to $2\frac{1}{4}$ % each for 1957-1959; it would rise to $2\frac{3}{4}$ % each in 1960; $3\frac{1}{4}$ % in 1965 and $3\frac{3}{4}$ % in 1970; it would be $4\frac{1}{4}$ % in 1975 and thereafter. For the self-employed the rate is $1\frac{1}{2}$ times the employee rate. The tax increases provided by the amendments were allocated for the disability benefits and would be placed in a separate trust fund.

During the year ended June 30, 1956, \$5,360,813,000 was paid out under the old-age and survivors insurance program—\$115,3340,000 of it in lump-sum death payments. At the end of June 1956 about 8,374,000 beneficiaries were getting benefits at a monthly rate of \$439,423,800. The average benefit paid to a retired worker was \$62.76.

Monthly retirement, long-term disability and survivor benefits were also being paid under other public programs. In June 1956 such benefits were going to 648,200 persons under the railroad retirement program, to 3,914,000 under the veterans' programs, and to 325,300 under the federal civil service program. A large group of beneficiaries was receiving such benefits under state and local government employee programs. For temporary disability that was not work-connected, benefits were being paid in four states and in the railroad industry. For work-connected disability, workmen's compensation programs were in effect for workers in all states and for federal employees.

The state-federal program of unemployment insurance pays benefits to qualified unemployed workers. The programs are financed by employer contributions and, in 3 jurisdictions, employee contributions. In June 1956 a weekly average of 1,072,000 unemployed workers drew benefits under the state programs and the program for federal workers; total benefits in the month were \$116,000,000. Workers in 11 states had their benefits supplemented by small allowances for their dependents. Under the Railroad Unemployment Insurance act, \$2,571,000 was paid in June 1956 to an average (in a 14-day period) of 23,000 unemployed railroad workers.

Assistance and Welfare.—Four special types of public assistance were established by the Social Security act—old-age assistance, aid to dependent children, aid to the blind and aid to the permanently and totally disabled. These programs are administered by the states; the federal government shares in the costs within certain maximums. The 1956 amendments to the Social Security act revised the federal formula for sharing in the assistance payments to permit greater federal financial participation, from Oct. 1956 through June 1959. The amendments also provided, beginning July 1957, a new basis for federal sharing in state expenditures for medical care for assistance recipients, separately from money payments to them.

Expenditures, federal, state and local, for assistance and administration of the four programs during the year ended June 30, 1956, totalled \$3,022,000,000. In June 1956, 2,523,700 needy persons aged 65 or over were receiving old-age assistance (the average payment was \$54.29); 2,250,200 persons, including 1,707,600 children, in 613,700 families were receiving aid to dependent children (average payment per family, \$89.27); 105,800 persons were receiving aid to the blind (average payment, \$60.42); and 258,300 persons in 45 states were receiving aid to the permanently and totally disabled (average payment, \$56.72). About 290,000 cases (640,000 persons) were receiving general assistance, financed by states and localities without federal funds; the average payment per case was \$51.94.

The Social Security act also authorizes federal grants to the states to extend and improve their maternity services for mothers and their health and welfare services for children, including services for crippled children. These grants are administered by the children's bureau.

During the year ended June 30, 1956, \$11,921,455 was paid to the states for maternal and child health services. Typical services were prenatal clinics, child health conferences, immunizations, public health nursing services and health services for children of school age by physicians and dentists. Federal payments to the states for services for crippled children totalled about \$14,803,364; the programs provided diagnostic, medical and surgical services and hospital and convalescent care. Federal payments of about \$6,895,090 were made to help the states, through their child welfare programs, protect and care for dependent and neglected children and children in danger of becoming delinquent.

Only one provision in the 1956 amendments to the Social Security act specifically affected these programs for children—a

\$2,000,000 increase in the authorized amount of federal funds for the child welfare programs. (C. I. S.)

Canada.—The intergovernmental committee of health and finance ministers, set up at the Oct. 1955 federal-provincial conference, convened in Jan. 1956 to hold further discussions on health insurance. In the course of these deliberations, a specific proposal was put forward by the federal government under which it offered to share with the provinces one-half the costs of an insurance system to provide basic ward hospital care and certain laboratory and radiological diagnostic services.

Federal payments would be based on a formula that, while meeting 50% of the national costs as defined, would be weighted to take account of the provinces' varying financial capacities and to provide incentives to economic operation. As a result, the less wealthy provinces would receive more than 50% of their costs while the wealthier ones would receive slightly less than this percentage. The proposed scheme would be administered by the provinces who would decide on methods of financing their share of the costs, and would involve no constitutional change or interference in provincial affairs. The role of the federal government would be limited to the provision of financial support and technical assistance. The program was to go into operation when agreement had been reached with a majority of the provinces representing a majority of the Canadian people.

The Unemployment Assistance act was passed by parliament in July 1956. This legislation authorized the federal government to share with any province signing an agreement a portion of provincial expenditures for assistance to needy persons who were unemployed and who were not covered by other established social welfare measures. Claims for federal assistance could be made when the number of persons receiving aid exceeded 0.45% of the total provincial population. The federal government undertook to share 50% of provincial expenditures on agreed items above this level. There was to be no ceiling on the total federal contribution. It was left to the provinces, and to the municipalities where they were involved, to determine the level of assistance to be paid and the conditions under which it could be obtained. (G. Cy.)

Great Britain.—There was no change in the general rates of benefit under the national insurance scheme in Great Britain, but the government was pressed to make it possible for the retired pensioner, between the ages of 65 and 70, to earn more than the stipulated amount of 40s. without a reduction of his pension. Following consideration by the National Insurance Advisory committee, the amount was raised to 50s. Provision was also made that the rate of pension otherwise payable should be reduced by 6d. for each 1s. of net earnings above 50s. and up to 70s. a week, and by 1s. for each 1s. of net earnings thereafter except in the case of married women with retirement pensions on their husband's insurance, for whom the previous rule remained unchanged.

The family allowance scheme in Great Britain was altered to enable the allowance to be paid up to the age of 18 in respect of a child who remained at school or was apprenticed, and up to the age of 16 in respect of an incapacitated child. There was a general increase of 2s. in the weekly rate for the third and subsequent children of a family. The annual report of the ministry of pensions and national insurance for 1955 showed that family allowances were being paid to about 3,750,000 families containing about 8,000,000 children.

By the end of 1955 it was possible for the first time for the maximum of ten increments of retirement pension to be paid at the highest rate. A single person could thus qualify by remaining at work five years after pensionable age for a pension of 55s. and a married couple for 90s. if the husband only was insured or 110s. if both were insured. At the end of the year the number

of persons who had reached minimum pension age during the previous five years and had not retired was nearly 450,000.

The report of the National Assistance board for 1955 showed reduction in the number of persons receiving assistance because 111,000 persons became entitled to higher rates of pension and benefit under the National insurance scheme. Of the 460,000 persons under pensionable age who were receiving allowances, 246,000 were incapacitated for work by sickness or disability. The total net expenditure of the board for 1955 was about £122,727,000, of which about £98,220,000 was for national assistance grants and about £17,280,000 was for noncontributory old-age pensions.

At the end of 1955, 870,000 war pensions were being paid of which about 385,000 related to World War I and 487,000 to World War II.

Other Countries.—In the German Federal Republic, unemployment assistance was replaced by unemployment aid. By the change of title it was intended to emphasize that it was different from benefits provided by the public welfare authorities. Unemployment aid became organized in a uniform manner over the whole territory of the Federal Republic, and also in west Berlin. Those disqualified were persons over age 65; recipients of a pension for invalidity or occupational incapacity under the insurance scheme and recipients of other benefits of a public character. The rates of the allowances were based on the level of the wages. The maximum rates varied between 90% of the minimum earnings and 69.8% of the maximum earnings. Both husband and wife were entitled to aid. Unemployment aid was financed from federal taxes and was administered by the Federal Placement and Unemployment Insurance institute. In Germany, also, old-age pensions rates were increased.

In Austria unemployment insurance was extended to domestic workers and in Italy to agricultural workers. In the Netherlands the family allowance scheme was extended to cover invalid children of over 20 and under 27 years of age. Children's allowances under the insurance scheme were also made payable in respect of invalidity to orphans under 27 years. In Norway the scope of sickness insurance was extended to cover about 330,000 persons who had previously been excluded. In Switzerland there were increases in pension rates for those who were 65 or over when the scheme came into force in 1948. In Turkey the annual rate of pensions was raised to 20% of the contributions paid by the insured person and his employer during the whole of the insured's career, subject to a minimum rate which was increased. In Nicaragua a comprehensive social security scheme was introduced for the first time, administered by a new body called the National Social Assistance and Welfare board. The scheme provided for compulsory contributions for all employed persons. In Japan a new five-year social security plan was adopted covering the period from 1956 to 1960 and providing for the extension and improvement of sickness insurance. An additional 30,000,000 persons would be covered. (JN. M.)

Social Service: see CHILD WELFARE; SOCIAL SECURITY.

Societies and Associations, U.S. The following is a selected list of U.S. societies and associations, with date of founding, membership, officers and chief activities during 1956.

(See also the separate articles on RED CROSS; VETERANS' ORGANIZATIONS, U.S.; etc.)

Alcoholics Anonymous.—Alcoholics Anonymous is a fellowship of men and women organized in 1935 to help the alcoholic recover. The only requirement for membership is stated to be "an honest desire to stop drinking." In 1956 there were 136,000 members in 6,249 groups throughout the world. The organization publishes the book *Alcoholics Anonymous*, the monthly

The A.A. Grapevine and various other books and pamphlets. Officers' names are not given because of the organization's tradition of anonymity. It is supported solely through voluntary contributions. Headquarters: P.O. Box 459, Grand Central Annex, New York 17, N.Y.

Altrusa International, Inc.—Founded and incorporated in 1917, this organization's purpose is to provide a main channel through which professional and executive women in diversified occupations might join forces to work for community and world improvement. Membership, 1956, 14,000 in 350 clubs located in the U.S., Canada, Great Britain, Guatemala, Hawaii, Mexico, Bermuda and Puerto Rico. In 1956 the organization carried out projects in public affairs, vocational information and international relations, and awarded grants to Latin-American and Asian women graduates who were in the U.S. for higher study. Club funds available during 1956-57 totalled \$23,887. Publication: *International Altrusan*. Officers (1956) included: Marjorie Lamb, president; Edith W. Nelson, president-elect. Headquarters: 332 S. Michigan Ave., Chicago 4, Ill.

American Academy of Arts and Letters.—The purpose of the academy, founded in 1904, is to further "the interests of literature and the fine arts in America." In 1956 the academy consisted of 47 members chosen from the 250 members of its parent organization, the National Institute of Arts and Letters. On May 23, 1956, the joint annual ceremonial with the National Institute of Arts and Letters was celebrated. There were many exhibitions, notably a memorial exhibition of the works of Gifford Beal and a literary exhibition showing manuscripts from the academy collection. Publications include *Proceedings*, an annual; and *Yearbook of the National Institute and the American Academy*. Officers during 1956 were: Archibald MacLeish, president; Mark Van Doren, chancellor; Douglas Moore, secretary; Deems Taylor, treasurer. Headquarters: 633 W. 155th St., New York 33, N.Y.

American Academy of General Practice.—The academy was founded in 1947 to promote high standards in the general practice of medicine and surgery, to encourage medical students to qualify for and establish themselves in general practice, to assure the right of the general practitioner to engage in medical and surgical procedures for which he is qualified, and to develop postgraduate study programs for general practitioners. Membership, open to all physicians engaged in the general practice of medicine and surgery, numbered 22,249 in 1956. The Annual Scientific assembly of postgraduate training was held in Washington, D.C. Research studies in 1956 included better integration of general practice departments into hospitals and a survey of physicians' prescription habits. The academy has no endowment. Publication: *"GP"* (monthly). Officers (1956) included: J. S. DeTar, president; M. F. Cahal, executive secretary. Headquarters: Volker Blvd. at Brookside, Kansas City 12, Mo.

American Academy of Political and Social Science.—Founded in 1889 and incorporated in 1891, this organization acts as a forum for the discussion of social, political and economic questions through meetings and publications. The general topic of the annual meeting of the academy, held April 20-21, 1956, was "Africa and the Western World." Membership as of Jan. 1, 1956, was 14,478. Publication: *The Annals*, a bimonthly journal. Officers (1956) included: Thorsten Sellin, acting president; Raymond T. Bowman, secretary. Headquarters: 3937 Chestnut St., Philadelphia 4, Pa.

American Association for the Advancement of Science.—Founded in 1848, this association seeks to further the work of scientists, facilitate cooperation among them and improve public understanding of the importance of science in human progress. Membership in 1956 was 51,000. During 1956 the annual national meeting was held in New York, N.Y. Publications: *Science*, weekly; *Scientific Monthly*; and others. Officers (1956) included: Paul B. Sears, president; Dael Wolfe, executive officer. Headquarters: 1515 Massachusetts Ave. N.W., Washington 5, D.C.

American Association of University Professors.—This organization of college and university teachers was founded in 1915 to promote discussion and action on problems affecting education in institutions of higher learning, and to provide means of expression for its membership. Membership in 1956 was 37,567. Publication: *The Bulletin*, a quarterly journal. Officers (1956) included: Helen C. White, University of Wisconsin, president; Ralph F. Fuchs, general secretary. Headquarters: 1785 Massachusetts Ave. N.W., Washington 6, D.C.

American Association of University Women.—This organization was founded in 1882 as the Association of Collegiate Alumnae for "the uniting of the alumnae of different institutions for practical educational work," maintenance of high standards of education and more effective participation of college women in the processes of democracy. Membership in 1956 was 140,000. Its principal activity of 1956 was a study-action program in the fields of education, international relations, social studies, status of women, the arts and legislation. Publications: *Journal* (quarterly), the *General Director's Letter*, handbooks, study guides and bibliographies. Endowed funds totalled \$1,485,000 in 1956. Officers (1956) included: Anna L. Rose Hawkes, president; Helen D. Bragdon, general director. Headquarters: 1634 I St. N.W., Washington 6, D.C.

American Bankers Association.—Founded in 1875, the primary objective of this organization is to promote the usefulness of banks. In 1956, it had a membership of 17,385 banks and banking offices. It is the parent organization of the American Institute of Banking for bank employees and the Graduate School of Banking for bank officers. During 1956, a subcommittee of the U.S. senate committee on banking and currency was named, under the chairmanship of Sen. A. Willis Robertson, to study the monetary system and financial institutions. The association actively co-operated in this study and expanded its Washington, D.C., office to include a new department of government relations. Officers (1956-57) were: Erle Cocke, Fulton National Bank, Atlanta, Ga., president; Joseph C. Welman, Bank of Kennett, Kennett, Mo., vice-president; George R. Boyles, Merchants National Bank, Chicago, Ill., treasurer. Headquarters: 12 E. 36th St., New York 16, N.Y.

American Bar Association.—Founded in 1878 to advance the science of jurisprudence and promote the administration of justice in the U.S., the association had a membership of more than 83,000 in 1956. Through the American Bar foundation, an enlarged legal research program was inaugurated. Publications include the *American Bar Association Journal* and the *American Bar News*, both monthly; an annual volume of reports and proceedings; and various pamphlets. Officers (1956-57) included: David F. Maxwell, president; Charles S. Rhyne, chairman of the house of delegates;

Joseph D. Stecher, secretary; Harold H. Bredell, treasurer. Headquarters: 1155 E. 60th St., Chicago 37, Ill.

American Bible Society.—Founded in 1816, the society encourages the wider circulation and use of the Holy Scriptures without note or comment and without purpose of profit. During 1956 translations of the Bible were being made in a number of languages, and there was much activity in revisions. Volumes issued from the Bible House in New York city in 1955 totalled 14,918,353. Works for the blind were distributed in 41 languages and systems. Membership (1956): about 300,000. Publication: *The Bible Society Record*. Officers (1956) included: Eric M. North and Robert T. Taylor, general secretaries; Gilbert Darlington, treasurer. Headquarters: 450 Park Ave., New York 22, N.Y.

American Cancer Society.—Founded in 1913, the society is devoted to cancer control in the U.S. by means of public and medical education, service to patients and research to discover causes and cures for cancer. It is composed of 60 chartered divisions, serving the U.S. and Alaska through 2,788 units and more than 1,000,000 volunteers. For the fiscal year 1956-57 the society allocated \$6,750,000 for its national research program and supported 501 grants and fellowships in 139 universities and scientific institutions. Publications: *Cancer News*, quarterly; *Cancer*, bimonthly; *CA*, bimonthly medical digest; *Annual Report*. The funds of the society are secured through public contributions. Officers (1956-57): David A. Wood, president; Lane W. Adams, treasurer; Granville Whittlesey, Jr., secretary. Headquarters: 521 W. 57th St., New York 19, N.Y.

American Chemical Society.—Founded in 1876 to encourage the advancement of chemistry in all its branches, this organization endeavours to promote "research in chemical science and industry" and to maintain high standards among its members. In 1956 membership totalled 78,000. The association held two national meetings during 1956 and conferred medals for outstanding accomplishments in chemistry. Publications include *Journal of the American Chemical Society*; *Chemical Abstracts*; *Industrial & Engineering Chemistry*; *Chemical and Engineering News*; *Journal of Physical Chemistry*; *Journal of Organic Chemistry*; *Journal of Agricultural and Food Chemistry*; *Analytical Chemistry*. Officers (1956) included: J. C. Warner, president; Alden H. Emery, executive secretary. Headquarters: 1155 16th St. N.W., Washington 6, D.C.

American College of Dentists.—The association was formed in 1920 to advance the standards and efficiency of dentistry, stimulate graduate study in dentistry, confer fellowships in recognition of meritorious achievement especially in dental science, art and literature and improve public understanding of oral health service. Membership in 1956 was about 2,250. Activities throughout 1956 included Teacher's Training Fellowship award grants for graduate study and committee studies of various problems relating to dental health service. Publication: *Journal of the American College of Dentists* (quarterly). Officers (1956): Gerald D. Timmons, president; Alfred C. Young, vice-president; Otto W. Brandhorst, secretary. Headquarters: 4221 Lindell Blvd., St. Louis, Mo.

American College of Hospital Administrators.—Founded on Feb. 13, 1933, for the purpose of improving the care of the sick through the elevation of standards for hospital administration, the association conducts and promotes educational training, promotes adherence to a code of ethics and provides recognition for noteworthy service in the field of hospital administration. The 22nd annual meeting was held in Chicago, Ill., Sept. 15-17, 1956. In 1956 membership totalled approximately 3,000. Publications: *Hospital Administration*, quarterly; *News*, monthly; *Roster*, annually. Officers (1956): J. Dewey Ligan, president; D. Conley, executive director. Headquarters: 620 N. Michigan Ave., Chicago 11, Ill.

American College of Life Underwriters.—Founded in 1927 to establish an educational standard for the profession of life underwriting and to encourage sound life insurance education in colleges and universities, the college grants the Chartered Life Underwriter (C.L.U.) designation to candidates who pass five examinations in subjects related to life insurance (such as economics, family and business finance, social problems, law, taxes, trusts, etc.) and meet the college's requirements of experience and character. A total of 6,181 persons had attained the designation, and 8,737 had earned partial credit toward the designation by passing from one to four of the examinations. At the 29th conferment in Sept. 1956, 426 successful candidates became C.L.U.'s. In June 1956, 4,176 candidates took 5,277 examinations in 164 university locations. Publications: *Announcement*, *Annual Report*, *C.L.U. Annual Review*, brochures and material for teachers and candidates. Officers (1956-57): Julian S. Myrick, chairman of the board; Davis W. Gregg, C.L.U., president. Headquarters: 3924 Walnut St., Philadelphia 4, Pa.

American College of Physicians.—This society was founded in 1915 to bring together physicians of high standing for the maintenance and advancement of medical education, practice and research. Activities in 1956 included the 37th annual session at Los Angeles, Calif., April 16-20, plus 32 regional, state or multistate meetings and participation in many joint endeavours with other medical associations. The college also awarded 6 research fellowships and 11 Latin-American fellowships for training Latin-American doctors for teaching and research in their homelands. Membership in 1956 totalled approximately 9,174. Publications include a directory and *Annals of Internal Medicine*, monthly. Endowment funds totalled \$486,922.87. Officers (1956) included: Walter L. Palmer, president; William D. Stroud, treasurer; Wallace M. Yater, secretary-general; Edward R. Loveland, executive secretary. Headquarters: 4200 Pine St., Philadelphia 4, Pa.

American College of Surgeons.—Founded in 1913 to advance the science of surgery, the organization held its 42nd annual clinical congress in San Francisco, Calif., Oct. 8-12, 1956. Membership of the college in 1956 was 21,000. Publications: *Surgery, Gynecology and Obstetrics*, a monthly scientific journal, and the *Bulletin*, a bimonthly. Officers (1956) included: Warren Cole, president; Daniel C. Elkin, president-elect; Michael L. Mason, secretary. Headquarters: 40 E. Erie St., Chicago 11, Ill.

American Correctional Association (formerly American Prison association).—Founded in 1870 and incorporated in 1871, this association works for the improvement of laws governing public offenders, studies the causes of crime and the nature of offenders and their social surroundings, works for the improvement of penal institutions, and is concerned with the care of and provision of jobs for former prisoners. In 1956 the association sponsored the 86th annual congress of correction. Membership in 1956 was about 2,000, consisting of court, law-enforcement and penal officials and

citizens interested in crime problems. Publications: *American Journal of Correction* (formerly *Prison World*), bimonthly; *Directory of State and National Correctional Institutions*, annual; *Manual of Correctional Standards*, *Manual of Criminal Statistics*, and others. Officers (1956), Myrl E. Alexander, president; E. R. Cass, general secretary; John L. Schoenfeld, treasurer. Headquarters: 135 E. 15th St., New York 3, N.Y.

American Dental Association.—Founded in 1859 "to encourage the improvement of the health of the public and to promote the art and science of dentistry," this professional association numbered 85,984 members as of July 31, 1956. It continued support of measures to add fluoride salts to community water supplies to reduce tooth decay, and by Sept. 1956 almost 1,300 U.S. cities and towns were fluoridating their water supplies. The association in February sponsored its annual National Children's Dental Health week. In mid-1956, the association completed a \$1,400,000 expansion and remodelling program at its Chicago (Ill.) headquarters. The 97th annual session of the association was held in Atlantic City, N.J., Oct. 1-4, 1956. Publication: *Journal of the American Dental Association*. Officers (1956-57): Harry Lyons, president; Harold Hillenbrand, secretary; H. B. Washburn, treasurer. Headquarters: 222 E. Superior St., Chicago 11, Ill.

American Dialect Society.—This organization was founded at Harvard university in 1889 to collect, study and publish material on the English language, especially dialect as found in North America, together with other languages influencing it or influenced by it. Eight research committees were later formed to study the following: regional speech and localisms, place names, linguistic geography, usage, non-English dialects, new words, semantics and proverbial sayings. Membership in 1956 was 472. The annual meeting in 1956 was held in Washington, D.C. Publication: *Publication of the American Dialect Society*. Officers (1956) included: L. J. Davidson, president; I. Willis Russell, secretary-treasurer. Headquarters: University of Alabama, University, Ala.

American Economic Association.—This association, which in 1956 had 8,400 members and 3,000 library, corporate and individual subscriptions, was founded in 1885 to encourage economic research and freedom of economic discussion, and to issue publications on economic subjects. The annual meeting was held in Cleveland, O., Dec. 27-29, 1956. Publications include the *American Economic Review*, quarterly; *Papers and Proceedings* of the annual meeting. Officers (1956) included: Edwin E. Witte, University of Wisconsin, president; James Washington Bell, Northwestern university, secretary-treasurer and editor of the annual proceedings; Bernard F. Haley, Stanford university, managing editor of the quarterly. Headquarters: Northwestern university, Evanston, Ill.

American Geographical Society.—This organization was founded in 1852 to promote geographical research and exploration and to disseminate geographical knowledge. During 1956, the research activities of the society centered on medical geography; mathematical geography; glacial investigations; forest and climatic sequence on the west coast of North America; preparation of a series of geographical handbooks on strategic areas; and a new planning-scale map of Africa and Europe. Publications include *Geographical Review*, quarterly; and *Focus*. Membership (1956): about 4,500. Officers (1956) included: Richard Upjohn Light, president; Charles B. Hitchcock, director. Headquarters: Broadway at 156th St., New York 32, N.Y.

American Historical Association.—This association of professional and nonprofessional students of history, founded in 1884 and incorporated in 1889, was organized "for the promotion of historical studies, the collection and preservation of historical manuscripts, and for kindred purposes in the interests of American history. . . ." The association's membership in 1956 was 6,310, and its endowment was about \$700,000. Publications include the *American Historical Review*, *Annual Report*, and selected historical monographs. Officers (1956) included: Lynn Thorndike, president; Boyd C. Shafer, executive secretary and managing editor. Headquarters: Study Room 274, Library of Congress Annex, Washington 25, D.C.

American Institute for Property and Liability Underwriters, Inc.—The purpose of this organization, founded in 1942, is to establish and administer an educational standard for the profession of property and casualty insurance underwriting. Examinations are conducted annually in June at more than 130 locations. Those who successfully pass the examinations and fulfill the experience and ethical requirements are awarded the designation Chartered Property Casualty Underwriter (C.P.C.U.). By 1956, 1,690 persons had received the C.P.C.U. designation. The institute receives financial support from property and casualty insurance companies and organizations. Publications: *Announcement*, annual; and *C.P.C.U.—Its Purpose and Meaning*, study guides. Officers (1956): S. S. Huebner, chairman of the board; Hugh H. Murray, Jr., president; Harry J. Loman, dean; A. C. Goerlich, secretary. Headquarters: 3924 Walnut St., Philadelphia 4, Pa.

American Institute of Accountants.—The national professional society of certified public accountants was founded in 1887 to maintain high professional and ethical standards, to develop accountancy education and to provide for the examination of candidates for membership. In 1956 the institute had a membership of more than 28,000. The year's activities included the preparing of the uniform C.P.A. examination, and the issuing of bulletins on accounting procedure and case studies in auditing procedure. The annual meeting was held Sept. 23-27, 1956. Publications: *Journal of Accountancy* and *Certified Public Accountant*, both monthly; *The C.P.A. Handbook*; *Accounting Trends and Techniques in Corporate Annual Reports*; and others. Officers (1956-57) included: Marquis G. Eaton, president; J. L. Carey, executive director. Headquarters: 270 Madison Ave., New York 16, N.Y.

American Institute of Architects.—The objects of this organization, founded in 1857, are "to promote the aesthetic, scientific and practical efficiency of the architectural profession; to advance the standards of architectural education, training and practice; and to co-ordinate the building industry and the profession of architecture." Membership in 1956 was 10,900. Publications: *Journal*, monthly; *Bulletin*, bimonthly; and *Memo*, biweekly. Officers (1956) included: Leon Chatelain, Jr., president; Edward L. Wilson, secretary; Raymond S. Kastendieck, treasurer. Headquarters: 1735 New York Ave. N.W., Washington 6, D.C.

American Institute of Chemical Engineers.—This organization was founded in 1908 for the advancement of chemical engineering in theory and practice and the maintenance of a high professional standard among its members. As of July 31, 1956, membership was 15,716. Publications: *Chemical En-*

gineering Progress, monthly; *Journal*, quarterly. Officers (1956) included: Walter G. Whitman, president; F. J. Van Antwerpen, secretary. Headquarters: 25 W. 45th St., New York 36, N.Y.

American Institute of Electrical Engineers.—This association was founded in 1884 to advance the theory and practice of electrical engineering and of allied arts and sciences and to maintain a high professional standing among its members. Its 1955-56 activities included 4 general meetings, 3 district meetings and 22 special technical conferences. The institute participated in many engineering activities with other societies and there was also much activity in the technical divisions and technical committees in advancing developments in science and art. Membership in 1956 was 50,000. Endowment funds as of 1956: \$1,250,000. Publications: *Electrical Engineering*, monthly; *Transactions*, annually; *Preprints* and special publications, published irregularly. Officers (1956): M. S. Coover, president; N. S. Hibshman, secretary. Headquarters: 33 W. 39th St., New York 18, N.Y.

American Institute of Mining, Metallurgical, and Petroleum Engineers.—This society was founded in 1871 to promote the arts and sciences connected with the economic production of minerals and metals and the welfare of the individuals employed in these industries. The regular annual meeting was held in Feb. 1956. In 1956 there were 25,000 members and 2,800 student associates. Publications: *Mining Engineering*, *Journal of Metals* and *Journal of Petroleum Technology*, all monthly. The institute's endowments totalled \$1,350,000 in 1956. Officers (1956) included: Carl E. Reistle, Jr., president, and E. O. Kirkendall, secretary. Headquarters: 29 W. 39th St., New York 18, N.Y.

American Institute of Physics, Inc.—This organization was founded in 1931 for the "advancement and diffusion of knowledge of the science of physics and its applications to human welfare." In 1956 membership totalled 17,000. Particular attention was given to the publication of scientific journals during 1956, and a new expanded program for the translation and publication of four leading Russian physics journals was announced. Publications: *Review of Scientific Instruments*; *Journal of Chemical Physics*; *Journal of Applied Physics*; *Physics Today*; others. Officers (1956): Frederick Seitz, chairman; Henry A. Barton, director; Wallace Waterfall, secretary; Mark W. Zemansky, treasurer. Headquarters: 57 E. 55th St., New York 22, N.Y.

American Iron and Steel Institute.—In 1908 this organization was founded to promote the interests of the iron and steel industry, distribute information and promote discussion of problems relating to the industry. During 1956 the organization was active in research, public relations, statistics, engineering and industrial relations, including health and safety. Its 1956 membership included 2,550 active, associate, honorary and emeritus members, and 102 company members. Publications: *Steelways* and *Steel Facts*, both bimonthly, and numerous booklets and pamphlets. Officers (1956) included: B. F. Fairless, president; Max D. Howell, executive vice-president; George S. Rose, secretary. Headquarters: 150 E. 42nd St., New York 17, N.Y.

American Law Institute.—The purpose of this organization, founded in 1923, is to promote the clarification and simplification of the law and its better adaptation to social needs. In 1956 the committee on continuing legal education conducted and sponsored numerous courses and lectures throughout the U.S., and issued *The Practical Lawyer*, a periodical. Work continued in 1956 on the drafting of a federal income, estate and gift tax statute, and further drafts of a five-year project to draft a code of substantive criminal law were completed. In 1956 there were 1,376 elected members. Officers (1956) included: Harrison Tweed, president; Herbert F. Goodrich, director and secretary; Bernard G. Segal, treasurer. Headquarters: 133 S. 36th St., Philadelphia 4, Pa.

American Mathematical Society.—This organization was established in 1888 to further the interests of mathematical scholarship and research. Publications: *Bulletin of the American Mathematical Society*; *Proceedings of the American Mathematical Society*; *Transactions of the American Mathematical Society*; and *Mathematical Reviews of the American Mathematical Society*. Membership in 1956 was approximately 5,000. Officers (1956) included: R. L. Wilder, president; E. G. Begle, secretary. Headquarters: 190 Hope St., Providence 6, R.I.

American Medical Association.—This federation of constituent state and territorial medical associations was founded in 1847 to promote the science and art of medicine and the betterment of public health. Activities during 1956 included the evaluation of new drugs, foods, physical medicine devices and techniques; the approval of medical schools; the evaluation of hospitals for internship and residency training programs; the provision of two postgraduate training meetings for physicians. Publications: *Journal of the American Medical Association*; *American Medical Directory*; *Today's Health*, a monthly magazine; and special publications. Membership in 1956 was approximately 160,000. Officers (1956): Dwight H. Murray, president; David B. Allman, president-elect; George F. Lull, secretary and general manager. Headquarters: 535 N. Dearborn St., Chicago 10, Ill.

American Optometric Association.—Founded in 1897, this organization's purpose is to promote the visual welfare of America and serve the professional interest of optometrists. During 1956 the association engaged in public information programs; produced a film strip, "Your Child's Vision"; held the annual congress at Miami Beach, Fla.; and held seminars on children's vision, occupational vision and motorists' vision. Membership in 1956 totalled 11,000. The association sponsored the National Save Your Vision week, March 4-10, 1956. Publication: *Journal of the American Optometric Association*, published monthly. Officers (1956) included: Rupert E. Flower, president; H. Ward Ewalt, treasurer; E. H. Kickenapp, secretary. Headquarters: 4030 Chouteau Ave., St. Louis 10, Mo.

American Physical Society.—Founded in 1899 for the advancement and diffusion of the knowledge of physics, this society had more than 12,000 members in 1956. During the year eight meetings were held at various sites in the U.S. Funds as of 1956 were \$50,000, to sustain the O. E. Buckley prize for research in solid-state physics. Publications: *Physical Review*; *Bulletin of the American Physical Society*; *Reviews of Modern Physics*. Officers (1956) included: E. P. Wigner, president; H. D. Smyth, vice-president; K. K. Darrow, secretary; G. B. Pegram, treasurer. Headquarters: Columbia university, New York 27, N.Y.

American Society of Agricultural Engineers.—This organization was organized in 1907 to promote the science and art of engineering in agriculture,

to encourage original research and to co-operate with other groups in broadening the usefulness of agricultural engineering. In 1956 it had 4,800 members. Publications: *Agricultural Engineering*, monthly; and *Agricultural Engineers Yearbook*. Officers (1956-57): Roy Bainer, president; J. L. Butt, secretary; R. A. Palmer, treasurer; J. A. Basselman, publisher and editor. Headquarters: 420 Main St., St. Joseph, Mich.

American Society of Civil Engineers.—Founded in 1852 as the first national engineering group, the society's sphere of influence encompasses technical advances in the profession as well as the professional advancement of its membership. In 1956 membership was 39,473. Organized for the purpose of advancing the sciences of engineering and architecture, the society directs professional activities from its headquarters in New York city, through 74 local sections and student chapters in 137 engineering colleges; also the 14 following technical divisions: air transport, city planning, construction, engineering mechanics, highways, hydraulics, irrigation and drainage, pipeline, power, sanitary engineering, soil mechanics and foundations, structural, surveying and mapping, and waterways and harbours. Publications: *Proceedings*, monthly; *Transactions*, yearly; *Civil Engineering*, monthly; a *Directory* (membership list); and a *Register* (organization details). Officers (1956): Enoch R. Needles, president; William H. Wisely, executive secretary. Headquarters: 33 W. 39th St., New York 18, N.Y.

American Society of Composers, Authors and Publishers (ASCAP).—Founded in 1914, the society, a voluntary, nonprofit unincorporated association, collects performing right royalties for allocation to members whose copyrighted musical works are used in public performances for profit. In 1956 3,900 writers and 907 publishers were members. Officers (1956) included: Paul Cunningham, president; Louis Bernstein and Otto A. Harbach, vice-presidents; John Tasker Howard, secretary; Saul H. Bourne, treasurer. Headquarters: 575 Madison Ave., New York 22, N.Y.

American Society of Heating and Air-Conditioning Engineers.—The purpose of this society, incorporated as the American Society of Heating and Ventilating Engineers in 1895, is to improve the science of heating, ventilating, cooling and air conditioning. The organization maintains a research laboratory which, from its inception in 1919 to 1956, had spent more than \$2,000,000 on research activities. Membership in 1956 was 10,784. Publications: *Transactions*, annual; *Heating, Piping and Air Conditioning*, monthly; and *Heating, Ventilating and Air Conditioning Guide*. Officers (1956) included: John W. James, president; R. A. Sherman, treasurer; and A. V. Hutchinson, executive secretary. Headquarters: 62 Worth St., New York 13, N.Y.

American Society of Mechanical Engineers.—This organization was founded in 1880 to promote the art and science of mechanical engineering, to encourage original research, to foster engineering education, to advance the standards of engineering and to promote interchange of ideas among engineers and with allied technologists. In 1956 the society held 4 national meetings and 16 professional division conferences. In addition, meetings were held by the 85 local sections, 15 subsections, 5 groups and the 142 student branches. Membership in 1956 totalled 40,917. Publications: *Journal of Applied Mechanics*, quarterly; *Mechanical Engineering and Applied Mechanics Reviews*, both monthly; *ASME Mechanical Catalog and Directory*, annual, and others. Officers (1956): Joseph W. Barker, president; C. E. Davies, secretary; J. L. Kopf, treasurer. Headquarters: 29 W. 39th St., New York, N.Y.

American Sunday-School Union.—The purpose of this organization, founded in 1817 as the Sunday and Adult School union, is "to organize and maintain Sunday schools in the rural areas of the United States and to publish and circulate Christian literature." During 1956, 1,490 vacation Bible schools were held with an enrolment of 46,981. More than 2,100 rural Sunday schools enrolled 87,412, and 121 Young People's Bible conferences were attended by more than 9,000 rural youths. The Pioneers For Christ, organized in 1952 for rural boys and girls of high school age, continued to make rapid progress. Publications included a full line of Sunday-school periodicals. The work is supported largely by contributions and a small endowment. Officers (1956): James F. Shrader, president; Lester E. Spencer, secretary of missions; William J. Jones, editor of publications. Headquarters: 1816 Chestnut St., Philadelphia 3, Pa.

Arthritis and Rheumatism Foundation.—This foundation was founded in 1948 to formulate and carry out a national program of research and education in the rheumatic diseases, discover their causes and develop methods for prevention and provide systematic rehabilitation for the disabled. In 1956 the foundation awarded 28 basic research fellowships, and distributed about 300,000 copies of publications about arthritis to physicians. In 1956 there were 44 chapters which provided care to arthritics through foundation-supported facilities. Publications: *Bulletin on Rheumatic Diseases*; *Manual for Arthritis Clinics*; pamphlets and booklets. The foundation is supported by voluntary contributions. Officers (1956) included: Gen. George C. Kenney, president; George C. Texter, treasurer; Hayden N. Smith, secretary. Headquarters: 23 W. 45th St., New York 36, N.Y.

Boy Scouts of America.—This nation-wide youth organization with activities for boys of eight years and older was incorporated in 1910 and chartered by congress in 1916. Objectives are to teach patriotism and citizenship, character development and the importance of religion in daily life. In 1956 the 46th annual meeting of the national council was held in Cincinnati, O. Membership as of July 31, 1956, was 3,023,279 boys and 112,381 adults in 54,374 scout troops, 38,648 cub packs and 14,744 explorer units. Publications include *Scouting* magazine, *Boys' Life* and the *Scout Executive*. Headquarters: New Brunswick, N.J.

Brookings Institution.—A nonprofit organization dedicated to public service through research and education in economics and government, the institution was incorporated on Dec. 8, 1927, and is supported by income from its own endowment, grants from foundations and the sale of publications. During 1956 the following studies were published: *An Introduction to Economic Reasoning*, by Marshall A. Robinson, Herbert C. Morton and James D. Calderwood; *The United Nations and Human Rights*, by James Frederick Green; *Television and Presidential Politics*, by Charles A. H. Thomson; *United States Foreign Policy, 1945-1955*, by William Reitzel; *Morton A. Kaplan and Constance G. Coblenz; The Changing Environment of International Relations*, Brookings Lectures, 1956, by Grayson L. Kirk and others; *The Metropolitan Transportation Problem*, by Wilfred Owen. Officers (1956) included: William R. Biggs, chairman of the board; Robert D. Calkins, president; Mildred Maroney, treasurer; Elizabeth H. Wilson, secretary. Headquarters: 722 Jackson Pl. N.W., Washington 6, D.C.

Buhl Foundation.—Established in 1928, the foundation had by 1956 granted to existing (or especially established) agencies a total of \$10,339,634 for the promotion of nationally significant programs in the Pittsburgh district—in education, health, historical research and publication, and research in natural sciences. During the year a third unit was completed in the foundation's Chatham Village, internationally known demonstration of a large-scale planned residential community built for long-term investment. The Buhl planetarium, built and maintained as a memorial to the founder, has conducted a program of popular science education, from elementary school to adult level, since 1939. Foundation assets in 1956 were, book value, \$13,038,340. Director: Charles B. Nutting. Headquarters: Farmers Bank building, Pittsburgh 22, Pa.

Camp Fire Girls, Inc.—Founded in 1910, this youth organization offers all girls an educational and recreational program designed to develop the individual abilities of each member, to encourage spiritual and ethical values and love of home and family. In 1956, Camp Fire Girls observed Birthday week, March 17-18. In their national project, "Plant Seeds . . . Reap Friendship!", members sent vegetable seeds to Asiatic countries. More than 420,000 members were enrolled in 1956. The three age groups of Camp Fire Girls are: Blue Birds, 7 to 10 years old; Camp Fire Girls, 10 to 15 years old; and Horizon Club members, of senior high school age. Publications: *Book of the Camp Fire Girls*; the *Camp Fire Girl*, monthly; and others. National officers (1956) included: Mrs. Harold H. Hartman, president; John J. Wolkerstorfer, chairman of the board; Mrs. W. Harvey Young, secretary; Martha F. Allen, national director. Headquarters: 16 E. 48th St., New York 17, N.Y.

Carnegie Trusts.—Six autonomous and separately administered agencies in the U.S. were established by Andrew Carnegie for various philanthropic purposes; in addition, there are four Carnegie trusts in Great Britain, and Carnegie Hero funds operate in nine European countries.

Carnegie Corporation of New York (1911), with a basic endowment of \$135,000,000, had in 1956 assets of more than \$183,000,000; the income from \$12,000,000 of this is applicable in the British dominions and colonies. Its purpose is the advancement and diffusion of knowledge and understanding among the people of the U.S. and the British dominions and colonies. Its primary interests lie in the fields of higher education and public and international affairs. Grants totalling more than \$7,000,000 were awarded to institutions of higher education and organizations engaged in research and public education in 1956. President (1956), John W. Gardner; secretary, Florence Anderson. Headquarters: 589 Fifth Ave., New York 17, N.Y.

Carnegie Endowment for International Peace (1910), established by a gift of \$10,000,000, uses its income to further peaceful co-operation among nations. President (1956), Joseph E. Johnson; secretary, Leslie Paffrath. Headquarters: United Nations Plaza at 46th St., New York 17, N.Y.

Carnegie Foundation for the Advancement of Teaching (1905) was established to provide retiring pensions for college teachers and to advance higher education. In addition to an original grant from Carnegie of \$13,000,000, by 1956 it had received sums amounting to more than \$34,000,000 from the Carnegie Corporation for pension purposes and educational studies. President (1956), John W. Gardner; secretary, Florence Anderson. Headquarters: 589 Fifth Ave., New York 17, N.Y.

Carnegie Hero Fund Commission (1904), with assets in 1956 of approximately \$10,000,000, was established to recognize by medals and monetary awards heroic acts performed in the peaceful walks of life. President (1956), Thomas S. Arbutnot; manager, M. H. Floto. Headquarters: Oliver Building, Pittsburgh 22, Pa.

Carnegie Institute of Pittsburgh (1896) includes a department of fine arts, a music hall and a museum of natural history; to it are closely related the Carnegie Library of Pittsburgh, the Carnegie Library school and the Carnegie Institute of Technology. President (1956), James M. Bovard. Headquarters: 4400 Forbes St., Pittsburgh 13, Pa.

Carnegie Institution of Washington (1902), with assets of approximately \$56,000,000 in 1956, conducts fundamental scientific research particularly in astronomy, geophysics, embryology, genetics, plant biology and archaeology. President (1956), Caryl P. Haskins; executive officer, Paul A. Scherer. Headquarters: 1530 P St. N.W., Washington 5, D.C.

Catholic Community Service, National.—This service organization was founded on Nov. 13, 1940, to assist in meeting the religious, social and welfare needs of members of the armed forces, of workers and their families in defense industry areas and of patients in Veterans administration hospitals. During 1956 the service conducted volunteer work in 171 Veterans administration hospitals, staffed 50 U.S.O. clubs and also published and distributed more than 400,000 copies of religious publications. Publications: *NCCS News*; *NCCS-VA Hospital News*; several religious pamphlets; and *Greetings!*, a pamphlet for young men about to be inducted into the armed forces. Thomas D. Hinton was executive director in 1956, and the Most Rev. Francis P. Keough was president. Headquarters: 1312 Massachusetts Ave. N.W., Washington 5, D.C.

Catholic Organizations for Youth.—The National Council of Catholic Youth is sponsored by the National Catholic Welfare conference. Its purpose is to foster spiritual, cultural, social and physical activities, and to represent in the U.S. and abroad, all Catholic youth organizations. The College and University section includes the National Federation of Catholic College Students, reaching students in Catholic colleges, and the National Newman Club federation, reaching Catholic students in nonsectarian colleges. The Diocesan section reaches Catholic organized youth who are outside the college and university field. Parish youth organizations throughout the country affiliate with the council through their Diocesan youth directors; nine national organizations also are affiliated with the Diocesan section. The national organizations include: Catholic Kolping Society of America, Catholic War Veterans of U.S.A., National Catholic Camping association, Columbian Squires, Daughters of Isabella, Junior Catholic Daughters of America, The Queen's Work, Catholic Total Abstinence union and The Fighting 69th.

The total number of young persons reached by the various programs in 1956 was about 7,000,000. Publications include *Youth*, a magazine, and *Program Service*, a bimonthly activities suggestion publication. Director: Msgr. Joseph E. Schieder. Headquarters: 1312 Massachusetts Ave. N.W., Washington 5, D.C.

Catholic Welfare Conference, National.—This organization was founded

in 1919 to organize and co-ordinate the Catholic residents of the U.S. in works of education, social welfare, immigrant aid and other activities. It acts as a clearinghouse of information regarding activities of Catholic men and women. The National Council of Catholic Men produced in 1956 weekly radio programs and television programs. The membership of the conference was composed of the 209 archbishops and bishops of the U.S. and more than 16,000 affiliated lay societies. Officers (1956) included: Francis P. Keough, archbishop of Baltimore, Md., chairman; Joseph E. Ritter, archbishop of St. Louis, Mo., secretary. The general secretary was Msgr. Howard J. Carroll. Headquarters: 1312 Massachusetts Ave. N.W., Washington 5, D.C.

Chamber of Commerce of the United States.—A federation of businessmen's organizations founded in 1912, the chamber was organized "to promote a better understanding of the functions of American business enterprise and of the contribution of business to public well-being and to serve as a clearinghouse of business opinion on economic issues."

In 1956 the national chamber sponsored national conferences on current issues such as the U.S. highway program; improvement of living standards; community development; economy and taxes; labour relations; education; and increasing the effectiveness of U.S. business organizations. In 1956 there were 3,200 organization members (state and local chambers of commerce and trade and industrial organizations), with an underlying membership of more than 1,800,000.

Publications: *Washington Report*, weekly; *Nation's Business*, monthly; newsletters; and special reports, papers, studies, etc. Officers (1956): John S. Coleman, president; Clem D. Johnston, chairman of the executive committee; A. Boyd Campbell, chairman of the board. Headquarters: 1615 H St. N.W., Washington 6, D.C.

Charles Hayden Foundation.—This organization was established in 1937 under the will of Charles Hayden to assist young men to "receive proper training in boyhood and youth . . . in the manner of right and proper living." Its activities are devoted mainly to aiding boys' clubs, boys' camps and similar projects for underprivileged boys, especially those of the New York, N.Y., and Boston, Mass., areas. By Sept. 30, 1956, the foundation had contributed \$30,458,022 for these purposes, and there was \$58,124,218 in the fund. Officers: Edgar A. Doubleday, president, secretary and treasurer; Erle V. Daveler, chairman of the board. Headquarters: 25 Broad St., New York 4, N.Y.

Civitan International.—This organization was founded in 1920 and its purpose is best explained by its motto, "Builders of Good Citizenship." During 1956 principal activities included work on the March of Dimes, Cancer Crusade and Red Cross campaigns, safety projects and essay contests in high schools. Membership in 1956 was about 23,000. Publications: the *Civitan* magazine, edited monthly; informational booklets. Officers (1956) included: Luther R. Medlin, president; Rudolph T. Hubbard, secretary. Headquarters: 1523-28 Comer Bldg., Birmingham 3, Ala.

Commonwealth Fund.—Established in 1918 by Mrs. Stephen V. Harkness "to do something for the welfare of mankind," and increased by other bequests, the fund amounted to approximately \$76,000,000 at the end of the fiscal year 1955-56. Appropriations for that year were \$15,140,154.82. The major concern of the fund in 1956 was helping medical schools to reorient medical education to the student and medical care to the patient, by better integration and increased attention to the relation between the patient and his environment. Grants for medical education, including fellowships and awards in the health field, amounted to \$13,543,033; for experimental health services, \$72,000; and for medical research, \$717,546. During the academic year 1956-57, 62 persons were resident in the U.S. under Commonwealth fund fellowships, including 46 scholars, journalists and civil servants from Great Britain and other parts of the British Commonwealth and 16 scholars from western European countries. The fund publishes an annual report. Malcolm P. Aldrich was president in 1956. Headquarters: 1 E. 75th St., New York 21, N.Y.

Daughters of the American Revolution.—The National Society of the Daughters of the American Revolution was founded in 1890 for historical, patriotic and educational purposes. The society in 1956 had 183,447 members in 2,805 chapters. During the year it operated two schools and provided financial assistance to others; conducted programs for good citizenship; operated Junior American Citizens clubs; maintained a genealogical library; and presented awards for citizenship qualifications in accredited high schools. Publications: *Daughters of the American Revolution Magazine* and *Press Relations Digest*. Mrs. Frederic A. Groves was president general in 1956. Headquarters: 1776 D St. N.W., Washington 6, D.C.

Duke Endowment.—By an indenture executed Dec. 11, 1924, by James B. Duke, the Duke Endowment was established as a common-law trust "to make provision in some measure for the needs of mankind along physical, mental and spiritual lines." The fund allocates payments to educational institutions, including Duke university, Durham, N.C., and also distributes funds to help support hospitals, orphanages and the Methodist Church in rural areas. The total amount allocated and distributed as of Dec. 31, 1955, was \$122,045,652.15. The fund is supervised by a self-perpetuating board of 15 trustees. Officers (1956) included: George G. Allen, chairman; Alex H. Sands, Jr., vice-chairman; Randolph E. DuMont, treasurer. Headquarters: Power Building, Charlotte 1, N.C.

Elks, Benevolent and Protective Order of.—Founded in 1868, this service organization in 1956 had 1,250,000 members in its 1,766 lodges. Its purpose is to practise charity, justice, brotherly love and fidelity; to promote the welfare and enhance the happiness of its members; to quicken the spirit of American patriotism and cultivate good fellowship. During 1956 the organization donated funds for scholarships, infantile paralysis, cerebral palsy and other similar purposes. It emphasized its rehabilitation program in U.S. Veterans administration hospitals and in establishing fraternal centres for members of the armed forces. Publication: the *Elks Magazine*. Officers (1956): Fred L. Bohn, grand exalted ruler; L. A. Donaldson, grand secretary. National headquarters: 2750 Lakeview Ave., Chicago 14, Ill.

Falk Foundation, Maurice and Laura.—This foundation was established in 1929 with the broad purpose of the advancement of human welfare. During 1956 (to Aug. 17) grants totalling \$306,612 were made in support of college and university courses and field projects to prepare students for citizen participation in politics, and for further research to develop a uniform commercial code suitable for adoption by the legislatures of the

several states. Grants outside the foundation's major fields of interest included an allotment of \$120,000 to the Children's hospital of Pittsburgh, Pa., to develop a psychiatric service and training program. Funds as of Dec. 31, 1955, were \$15,398,161.25. Officers (1956) included: Leon Falk, Jr., chairman; Eugene B. Strassburger, secretary; J. Steele Gow, executive director. Headquarters: Farmers Bank building, Pittsburgh 22, Pa.

Ford Foundation.—The Ford foundation was founded in 1936 to receive and administer funds for scientific, educational and charitable purposes, all for the public welfare. During the fiscal year ended Sept. 30, 1956, it approved grants and appropriations totalling \$137,063,164 in support of activities devoted to education, citizenship training, economic development and administration, increasing knowledge of human behaviour, international understanding and economic and social development overseas. In addition, payments of \$500,000,000 in grants to colleges, universities, hospitals and medical schools began in April 1956. The total assets of the foundation as of Sept. 30, 1955, amounted to \$580,918,567. Officers (1956) included: H. Rowan Gaither, Jr., chairman; Henry T. Heald, president; Joseph M. McDaniel, Jr., secretary; Richard W. Lambourne, treasurer. Office: 477 Madison Ave., New York 22, N.Y.

Franklin Institute of the State of Pennsylvania.—This nonprofit institution was founded in 1824 for promotion of the mechanic arts. It devotes itself to interpreting science for nontechnical persons and to research for the benefit of industry and government. Activities include maintenance of the Benjamin Franklin memorial, a museum of science and industry, including Fels planetarium; a technical library of more than 250,000 volumes; lectures and exhibits on a wide variety of subjects; honour awards for distinguished achievements in science and technology; publication of the *Journal of the Franklin Institute*; the Franklin Institute Laboratories for Research and Development; the Bartol Research foundation; and the Bi-chemical Research foundation. In 1956 the institute conducted laboratories for research and development with divisions of mechanical engineering, electrical engineering, solid state physics, and chemistry and physics. Income is derived from dues of 7,500 members, museum and planetarium admissions, bequests and gifts, and industrial sponsorship of research and exhibits. Officers (1956): S. Wyman Rolph, president; John S. Burlew, executive vice-president and director. Headquarters: Benjamin Franklin parkway at 20th St., Philadelphia 3, Pa.

Freemasonry.—Said to be the oldest and largest fraternal organization in the world, the Masonic fraternity is nonsectarian and nonpolitical and has no benefit or insurance provisions. Its purpose is the moral and spiritual elevation of its members and, through them, of mankind. Since the 18th century its lodges have been joined together in grand lodges, mostly on a territorial basis, each grand lodge being independent. Masonic organizations based on lodge membership include the Royal Arch, the Knights Templar and the Scottish Rite. There are 49 grand lodges in the U.S., three in the British Isles, and one in each province of Canada and each state in Australia. There are many lodges in other parts of the world, except in the totalitarian countries. Masonic membership in the U.S. in 1956 was 4,000,000 in 15,765 lodges; world membership was in excess of 5,000,000. Publications: annual proceedings by all grand lodges and many of the related organizations; weekly, monthly and quarterly periodicals by some organizations and individuals.

Future Farmers of America.—Founded Nov. 20, 1928, this is a national organization of boys studying vocational agriculture in public secondary schools under the provisions of the national vocational education acts. The purpose of the Future Farmers is to develop agricultural leadership, co-operation and citizenship. Membership in 1956 was more than 382,000. Publications: *National Future Farmer*, quarterly; and various pamphlets. Officers (1956) included: Daniel B. Dunham, national president; Terrell Benton, Jr., student secretary. Headquarters: U.S. Department of Health, Education and Welfare, Office of Education, Washington 25, D.C.

Girl Scouts of the United States of America.—The purpose of this organization, founded in 1912 by Juliette Low, is "to help girls develop as happy, resourceful individuals willing to share their abilities as citizens in their homes, their communities, their country and the world." In 1956, 2,600,000 girls and adults, including brownie, intermediate and senior scouts, were members. The first national Girl Scout encampment held near Pontiac, Mich., June 29-July 11, 1956, was attended by 6,000 teen-age Girl Scouts and troop leaders. Publications: *Girl Scout Leader*; *American Girl*; and various handbooks. Officers (1956): Mrs. Roy F. Layton, president; Mrs. Charles H. Ridder, secretary; Dorcas Campbell, treasurer. Headquarters: 155 E. 44th St., New York 17, N.Y.

Grange, National.—This farmers' organization, founded in 1867, is said to be the largest farm fraternity in the world. Representing the voice and influence of farmers in all segments of the national economy, the organization sought in its 1956 program to advance legislation on local, state and national levels. Membership in 1956 totalled approximately 850,000 in 7,500 local units. Publication: the *National Grange Monthly*. Officers (1956): Herschel D. Newsom, master; Harry A. Caton, secretary. Headquarters: 744 Jackson Pl. N.W., Washington 6, D.C.

International College of Surgeons.—This organization was founded in 1935 to create a common bond among the surgeons of all nations, to promote the highest standards in surgery throughout the world without regard to nationality, creed or colour, and as a teaching postgraduate unit. The 10th biennial congress and 21st annual assembly of the U.S. and Canadian sections was held in Chicago, Ill., Sept. 9-13, 1956. Membership in 1956 was about 12,000. Publication: the *Journal of the International College of Surgeons*. Officers (1956) included: Carlos Gama (Brazil), president-elect; Max Thorek, founder and international secretary general. Headquarters: 1516 Lake Shore Dr., Chicago 10, Ill.

Jewish Welfare Board, National.—Founded in 1917, this agency is authorized by the U.S. government to serve the religious, welfare and morale needs of Jews in the U.S. armed forces at home and abroad and in Veterans administration hospitals. In 1956, it had 241 armed services committees. It recruited and served 355 full-time and part-time Jewish chaplains and represented the U.S. Jewish community in the United Service Organizations, on whose behalf it operated 30 clubs and area operations. Since 1921, it has also been the national association of Jewish Community centres and Young Men's and Young Women's Hebrew associations. Its 1956 membership included 352 centres with 565,000 members. Officers (1956): Charles Aaron, president; Frank L. Weil, honorary president; S. D. Gershovitz,

executive vice-president. Headquarters: 145 E. 32nd St., New York 16, N.Y.

John Simon Guggenheim Memorial Foundation.—Founded in 1925, the foundation "offers Fellowships, to further the development of scholars and artists by assisting them to engage in research in any field of knowledge and artistic creation in any of the fine arts including music, under the freest possible conditions." Fellowships are offered to citizens of the United States of America, all other American republics, the Republic of the Philippines, Canada and the British Caribbean. Endowment (1956): \$45,000,000. Officers (1956): Mrs. Simon Guggenheim, president; Henry Allen Moe, secretary. Headquarters: 551 Fifth Ave., New York 17, N.Y.

Kellogg Foundation.—The W. K. Kellogg foundation was established in 1930 to promote the health, education and welfare of mankind, principally of children and youth without regard to race, sex, creed or nationality. It functions through the divisions of agriculture, dentistry, education, medicine and public health, hospitals, nursing and the Latin-American division. It is administered by a board of nine trustees, and its assets totalled more than \$124,257,200 in 1956. Officers (1956): Emory W. Morris, president; Orville L. DeBolt, treasurer; Leonard L. White, secretary. Headquarters: 250 Champion St., Battle Creek, Mich.

Kiwanis International.—Founded Jan. 21, 1915, in Detroit, Mich., this service organization operates through community service clubs, comprised of business and professional men. During 1956 it sponsored with the U.S. air force the eighth annual observance of National Kids' day; served as co-ordinating agency for the second annual observance of Farm-City week; sponsored programs aimed at increasing religious interest; helped underprivileged children; promoted agricultural and conservation projects and vocational guidance programs. Membership in 1956 numbered more than 250,000 in more than 4,200 clubs in the U.S., Canada, Alaska, Hawaii and the Yukon territory. Publications: the *Kiwanis Magazine*; the *Keynote*, the official organ of the Kiwanis-sponsored Key clubs for outstanding high school youths; and the *Bulletin of Circle K International*, the official organ of the Kiwanis-sponsored Circle K clubs for college leaders. Officers (1956-57) included: Reed C. Culp, president; O. E. Peterson, secretary; H. Park Arnold, treasurer. Headquarters: 520 North Michigan Ave., Chicago 11, Ill.

Knights of Columbus.—This organization of Catholic men was founded in 1882 for the mutual help of its members. Later its purposes were broadened to include educational, charitable, religious, social and relief work. Its program of advertising the facts concerning the Catholic religion in newspapers and magazines, begun in 1948, was continued during 1956, resulting in 2,366,978 inquiries concerning Catholicism and the enrolment of 238,546 persons for instruction in the Catholic religion. Also its work of microfilming historic documents at the Vatican library, Vatican City, for deposit at St. Louis university (Mo.), where they would be available for study by scientists and scholars, was progressing. Membership in 1956 was 1,009,395. Publication: *Columbia*, a monthly. Luke E. Hart was supreme knight. Headquarters: Columbus Plaza, New Haven, Conn.

League of Women Voters of the United States.—Founded in 1920 to promote informed and active participation of citizens in government, membership in 1956 was 126,000 in 1,000 local leagues in 48 states, the District of Columbia, Alaska and Hawaii. In 1956 the league program included evaluation of the federal loyalty-security programs, with recognition of the need for safeguarding national security and protecting individual liberties; and a study of water resources. The organization is not endowed. Publications: the *National Voter*, newsletter issued 16 times a year; and *Report From the Hill*, issued monthly during sessions of congress. Officers (1956) included: Mrs. John G. Lee, president; Mrs. Donald F. Bishop, secretary; Mrs. Carl Marcy, treasurer. Headquarters: 1026 17th St. N.W., Washington 6, D.C.

Lions Clubs, International Association of.—The purpose of this organization, founded in 1917, is "to recognize community needs and develop means of meeting them, either through the clubs' own efforts or in co-operation with other agencies." In 1956 Lions clubs completed more than 170,000 activities for the betterment of communities, states and nations. These activities included projects in agriculture, education, and health and welfare. In 1956 there were 12,427 Lions clubs in 75 countries. Membership in 1956 was more than 542,000. Publication: the *Lion*, monthly. Officers (1956) included: John L. Stickley, president; R. Roy Keaton, director general. Headquarters: 209 N. Michigan Ave., Chicago 1, Ill.

Milbank Memorial Fund.—A membership corporation under the laws of the state of New York, this organization was founded in 1905 to improve the physical, mental and moral condition of humanity and generally to advance charitable and benevolent objects. In 1956 the fund appropriated funds to support activities and projects in the fields of public health and medicine. Total funds as of Dec. 31, 1955, amounted to \$15,620,830.01. Publications: *Milbank Memorial fund Quarterly*; *Annual Report*; *Proceedings of Annual Conference*. Officers (1956) included: Samuel R. Milbank, chairman of the board; Frank G. Boudreau, president. Headquarters: 40 Wall St., New York 5, N.Y.

Moose, Loyal Order of.—Founded in 1888, the purpose of this organization is "to unite in the bonds of fraternity, benevolence, and charity all acceptable . . . persons of good character; to educate and improve their members . . . to encourage tolerance of every kind . . . and to serve aged members and their wives. . . ." In 1956 the organization continued operations of its institutions at Mooseheart, Ill. (caring for children who had lost one or both parents), and Moosehaven at Orange Park, Fla. (for dependent elderly members). Membership in 1956 numbered 1,062,693. Publications: *Moose Magazine*; *Moose Docket*. Officers (1956): Paul P. Schmitz, director general; George Eubank, supreme secretary. Headquarters: Mooseheart, Ill.

National Academy of Sciences-National Research Council.—The academy was established in 1863 by act of congress as a nongovernmental organization of natural scientists to further science and advise the government in scientific matters. Membership in 1956 was 552; 30 new members are elected annually. The Research council was established by the academy in 1916; among its 243 members are representatives of major scientific and engineering societies and of the government. About 3,000 scientists serve on various boards and committees of the Academy-Research council. In 1956 the Academy-Research council advised the government on loyalty criteria for unclassified research grants, and reported on the biological effects of atomic radiation. It is endowed by the Carnegie Corporation of New York. Publications: *Proceedings of the National Academy of Sciences*; periodicals.

Detlev W. Bronk was president of the academy in 1956. Headquarters: 2101 Constitution Ave. N.W., Washington 25, D.C.

National Association for the Advancement of Colored People.—Founded in 1909, this organization directed its 1956 activities toward implementing the U.S. supreme court decisions banning segregation of races in public schools; abolishing segregation in private and public housing; securing the franchise for Negroes; and ending terrorist acts against Negroes. Membership in 1956 was approximately 305,000. Publications: *The Crisis*, a monthly magazine. Officers (1956) included: Arthur B. Spingarn, president; Roy Wilkins, executive secretary. Headquarters: 20 W. 40th St., New York 18, N.Y.

National Association of Manufacturers.—The N.A.M. was founded in 1895 to promote the industrial interests of the U.S., foster domestic and foreign commerce, improve employer-employee relations, protect individual liberty and the rights of employer and employee, and support legislation in furtherance of those principles. Its activities in 1956 concentrated on federal surtax rate reduction, correction of abuses in the labour field and creation of an atmosphere which inspires public confidence and faith in the future. Membership in 1956 was approximately 22,000. Publications: *N.A.M. News*, weekly; *Industrial Press Service*, biweekly; *Service for Company Publications*, monthly; *Program Notes*, bimonthly. Officers (1956) included: Henry G. Riter, III, chairman of the board; Cola G. Parker, president; Kenneth R. Miller, managing director; Thomas M. Brennan, secretary. Headquarters: 2 E. 48th St., New York 17, N.Y.

National Association of Real Estate Boards.—This association was founded in 1908 with the goal of raising the standards in the real estate profession. It holds all property rights in the term "realtor," a trade-mark which denotes a person engaged in the real estate business who is an active member, and who subscribes to the ethics, of the National Association of Real Estate Boards. In 1956 the organization and its specialized groups were comprised of 57,000 members and 1,200 real estate boards in the U.S., Canada and Hawaii. Headquarters: 1737 K St. N.W., Washington 6, D.C.

National Association of State Libraries.—This association was founded in 1889 "to develop and increase the usefulness and efficiency of the state libraries and other agencies performing library functions at the state level." Its 1956 membership included 231 institutional, individual, associate and honorary members. Publications include check lists of legislative journals and statutes; the *Newsletter*, quarterly; and a pamphlet, *Role of the State Library*. Officers: Ralph Hudson, state librarian, Oklahoma City, Okla., president; deLafayette Reid, Springfield, Ill., secretary-treasurer. Headquarters: Illinois State Library, Springfield, Ill.

National Council of the Churches of Christ in the United States of America.—The purpose of this nonprofit organization, founded in 1950, is to express practically the unity of spirit and purpose which Christian people have because of their common loyalty to Christ. It serves as a co-operative instrument of 30 nationwide Protestant and Eastern Orthodox communions, whose aggregate membership in 1956 was about 36,800,000. In 1956 the organization furthered its teachings via home and foreign missions, radio, television, educational films and the press. Publications include: the *National Council Outlook*; the *Church Woman*; *International Journal of Religious Education*. The budget for 1956 was more than \$13,000,000. Officers included: Eugene C. Blake, president; Charles E. Wilson, treasurer; Roy G. Ross, general secretary. Headquarters: 297 Fourth Ave., New York 10, N.Y.

National Education Association of the United States.—This organization was founded in 1857 "to elevate the character and advance the interests of the teaching profession and to promote the cause of education throughout the country." In 1956 the association continued construction of a new \$5,000,000 education centre in Washington, D.C., and held 70 major conferences and conventions. In 1956 membership was 659,000; membership of affiliated state associations was more than 1,000,000. Publications include the *NEA News*; *NEA Journal*; and a *Research Bulletin*. Officers (1956-57) included: Martha A. Shull, president; Gertrude E. McComb, treasurer; William G. Carr, executive secretary. Headquarters: 1201 16th St. N.W., Washington 6, D.C.

National Foundation for Infantile Paralysis, Inc.—Founded in 1938 by Franklin D. Roosevelt for the purpose of combating infantile paralysis (polio), the organization treats patients, extends fellowships and scholarships to train medical personnel in polio treatment methods, and finances research into prevention and treatment. In 1956 there were 3,100 chapters in the U.S., its territories and administered areas. During 1956 the foundation continued grants-in-aid to 18 regional respirator centres in hospitals. It also provided enough vaccine to inoculate all children in the first and second grades of school. Publication: *National Foundation News*, monthly. Support is derived by voluntary contributions to the annual March of Dimes in January. Officers (1956): Basil O'Connor, president; Raymond H. Barrows, executive director. Headquarters: 120 Broadway, New York 5, N.Y.

National Recreation Association.—Founded in 1906 to "help assure every child in America a place to play in safety and every person, young and old, an opportunity to find the best and most satisfying use of his expanding leisure time," this association in 1956 had 1,483 affiliate (agency) members, 3,318 associate (individual) members and 16,000 contributing members. Publication: *Recreation* magazine. Officers (1956): Otto T. Mallory, chairman of the board; Joseph Prendergast, executive director. Headquarters: 8 W. Eighth St., New York 11, N.Y.

National Science Foundation.—The National Science foundation is an independent agency of the federal government, established by congress in May 1950 "to promote the progress of science; to advance the national health, prosperity, and welfare; to secure the national defense; and for other purposes." The foundation consists of the National Science board and a director. Its principal activities are the development of national science policy; the support of basic research; and the furtherance of education in the sciences through the award of graduate fellowships and by other means. Detlev W. Bronk was chairman of the board in 1956 and Alan T. Waterman was director.

During 1956 the foundation awarded 706 grants, or a total of \$9,897,805, in the biological, mathematical, medical, physical and engineering sciences. The foundation awarded a total of 925 fellowships for the academic year 1956-57, including 775 predoctoral awards, 98 postdoctoral awards and 52 senior postdoctoral awards. During 1956 the foundation continued a com-

prehensive survey of science in the U.S., which included research and development in industry; research and development at nonprofit organizations; and studies of scientific manpower. Headquarters: 1520 H St. N.W., Washington 25, D.C.

National Society for Crippled Children and Adults, Inc.—Founded in 1921, this organization is also called the Easter Seal society. Its purpose is to help crippled children and adults by providing care and treatment services; to conduct a public educational program; and to encourage research into causes, prevention and treatment of crippling conditions. In 1956 the society maintained hundreds of facilities and programs, including diagnostic clinics, rehabilitation centres, employment programs and outpatient treatment-training centres. In 1956 there were state member societies in 52 U.S. states and territories, including the District of Columbia, Alaska, Hawaii and Puerto Rico. Publications: *Crippled Child Magazine*; *Bulletin of the National Society*; *Bulletin on Current Literature*. Funds derived from the 1956 annual Easter Seal campaign totalled \$9,600,000. Officers (1956) included: Theodore H. Wegener, president; Dean W. Roberts, executive director. Headquarters: 11 S. LaSalle St., Chicago 3, Ill.

National Temperance League, Inc.—This federation of state temperance organizations was formed by the merger in 1950 of the Temperance League of America and the National Temperance Movement, Inc. In 1956 the league sought federal action to ban the sale of alcoholic beverages upon air lines; to prevent the advertising of such beverages in interstate commerce and the dispensing of them in the armed services. It also sought to reduce the number of accidents resulting from drinking and to promote research and education with respect to drinking as a factor in modern social problems. The official publication is the *American Issue*. Officers in 1956 included: president, Duke K. McCall; executive director, Clayton M. Wallace. Headquarters: 131 Independence Ave. S.E., Washington 3, D.C.

Parents and Teachers, National Congress of.—This organization, founded in 1897 as the National Congress of Mothers, had in 1956 a membership of 10,130,352 parents, teachers and other citizens organized in 42,182 local associations. Its purpose is to promote the welfare of children; raise the standards of home life; secure laws for care and protection of children and youth; bring the home and school into closer relationship; and develop plans for joint action along these lines by educators and the general public. In 1956 a new action program was put into effect, based on the current administration theme: "The Family and the Community: Each Shapes the Other—The P.T.A. Serves Both." Publications include: the *National Parent-Teacher*; *The P.T.A. Magazine*; *National Congress Bulletin*; and *National Congress Proceedings*, annual. Officers (1956) included: Mrs. Rollin Brown, national president; Mrs. L. W. Alston, national secretary. National headquarters: 700 N. Rush St., Chicago 11, Ill.

Research Libraries, Association of.—Founded in 1931, this association of 45 institutions seeks "by co-operative effort to develop and increase the resources and usefulness of the research collections in American libraries." In 1956 it established a co-operative plan for the acquisition of foreign newspapers in a national pool. R. A. Miller was executive secretary in 1956. Headquarters: the Indiana University library, Bloomington, Ind.

Rockefeller Foundation.—Founded in 1913 "to promote the well-being of mankind throughout the world," the foundation during 1956 made grants to colleges, universities, research institutes and similar organizations. Its program for the advancement and application of knowledge to human welfare was concentrated in certain specific fields of medical education and public health, biological and medical research, agriculture, social sciences and humanities. The 21 trustees are the 21 members of the corporation. Assets as of Dec. 31, 1955, totalled \$547,450,313 (market value). Officers (1956): Dean Rusk, president; Edward Robinson, treasurer; Flora M. Rhind, secretary. Headquarters: 49 W. 49th St., New York 20, N.Y.

Rotary International.—Founded Feb. 23, 1905, this organization sponsors a program to encourage and foster the "ideal of service." Rotary activities include community betterment undertakings, leading boys and girls into good citizenship, promotion of high standards in businesses and professions, and the advancement of international understanding, good will and peace. By 1956, 827 Rotary fellowships for graduate study for one year abroad, averaging \$2,500 each, had been awarded to students from 61 countries for study in 40 countries, as a contribution by Rotary International in the field of international understanding. There were 9,200 Rotary clubs with a membership of 435,000 business and professional executives in 99 countries. The 1957 convention was to be held in Lucerne, Switz., May 19-23. Publications: the *Rotarian* (English) and *Revista Rotaria* (Spanish), monthly magazine; pamphlets. Officers (1956) included: Gian Paolo Lang, president; George R. Means, secretary. Headquarters: 1600 Ridge Ave., Evanston, Ill.

Russell Sage Foundation.—This foundation was established in 1907 by Mrs. Russell Sage for "the improvement of social and living conditions in the U.S." Its 1956 program consisted of varied research and consultation projects, designed to advance the use of the social sciences in the fields of health, education, philanthropy, professions and professional training, the child and the family and intergroup and cultural relations. Assets of the foundation, Sept. 30, 1956, were in excess of \$23,000,000 (market value). Officers (1956): Donald Young, president; E. W. Debevoise, chairman of the board; Dave H. Morris, Jr., treasurer; Ralph G. Hurlin, secretary. Headquarters: 505 Park Ave., New York 22, N.Y.

Seeing Eye, Inc.—A national philanthropy founded in 1929 and supported through annual memberships, public contributions and bequests. The society's purposes include securing and training dogs to guide blind persons, teaching instructors the technique of training guide dogs and teaching qualified blind people how to care for and use guide dogs. During 1956, 167 blind persons were provided with dog guides. Membership was about 20,000; 2,350 persons, of whom 1,000 had obtained second, third or fourth dogs, had received Seeing Eye dogs since the organization's inception. Publications: the *Seeing Eye Guide*, published quarterly for the members of the Seeing Eye; and printed booklets. Officers (1956): Henry A. Colgate, president; James Carey, treasurer; George Werntz, Jr., executive vice-president and secretary. Headquarters: Morristown, N.J.

Sloan Foundation, Inc., Alfred P.—Founded in 1934, the foundation is a nonprofit corporation established for educational, scientific and related purposes. The foundation's grants during 1956 went largely to projects in basic science, medicine, especially cancer and ophthalmological research,

scholarship and fellowship projects in colleges and universities, and popular educational projects. From 1937 to Aug. 1956 the foundation had made grants totalling more than \$31,000,000. The market value of the foundation's investments as of July 31, 1956, was approximately \$148,206,000. Officers (1956): Alfred P. Sloan, Jr., president; Raymond P. Sloan, vice-president; James F. Kenney, secretary and treasurer; Arnold J. Zurcher, vice-president and executive director. Headquarters: 30 Rocketteller Plaza, New York 20, N.Y.

Sodality of Our Lady.—This international Catholic body was founded in 1563 to advance the spiritual and corporal works of mercy under the patronage of the Mother of God. In 1956 seven weeks of leadership training were given in six U.S. cities and one in Canada. A total of 174 new sodalities were erected in the U.S. during the first six months of 1956. At the 18th annual meeting of Diocesan Sodality directors, the National Diocesan Sodality Directors' conference was established with the Rev. Erwin Juraschek of San Antonio, Tex., as president. The Rev. James J. McQuade, S. J., was named new national director in Sept. 1956. U.S. headquarters: 3115 S. Grand Blvd., St. Louis 18, Mo.

Twentieth Century Fund.—Founded in 1919 by Edward A. Filene, the fund is a nonprofit, nonpartisan foundation for research and public education on current economic and social problems. In 1956 the fund issued a report on the economic needs of older people and completed studies of U.S. farm commodity programs; antitrust policies and enforcement; and the economic effects of technological changes. Research projects relating to the U.S. economy included studies of distribution costs and methods, urban growth, civil-military relations and welfare and pension funds. Several projects of international scope were in progress, including studies of economic and political systems in the world, Europe's needs and resources, the European Coal and Steel Community, economic, social and political conditions in tropical Africa, and others. During 1956 the fund published three issues of a *Newsletter* and *Newsbriefs*, a clip-sheet, to keep its activities before the public. Total assets as of Dec. 31, 1955, were \$13,913,297. Officers (1956): Adolf A. Berle, Jr., chairman of the board; Francis Biddle, vice-chairman of the board; H. C. Sonne, treasurer; August Heck-scher, director. Headquarters: 330 W. 42nd St., New York 36, N.Y.

United States Junior Chamber of Commerce.—The purpose of this organization, founded in 1920, is to help make every community (and the country) a better place in which to live through the promotion of constructive civic projects, and to help develop civic leadership. In 1956 the chamber sponsored projects such as traffic safety, disaster relief, sports, and a public education program, and was active in such fields as agriculture, public health, fire prevention, voter registration, international relations and youth welfare. Membership in 1956 was 185,000 in 3,200 chapters. Publications: *Future and Action*, both monthly. Officers (1956) included: Wendell H. Ford, president; Ben Sisson, treasurer. Headquarters: 21st St. and Jaycee Blvd., Tulsa, Okla.

Woman's Christian Temperance Union, National.—The W.C.T.U., founded in 1874, is an organization of Christian women banded together to disseminate information as to what alcohol is and what it does, and the impact which the use of alcoholic beverages has upon the social and economic life of the nation. Membership, about 400,000; publications include the *Union Signal*, weekly, and the *Young Crusader*, monthly for children. Officers (1957): Mrs. Glenn G. Hays, president; Mrs. Fred J. Tooze, corresponding secretary; Mrs. H. F. Powell, treasurer. Headquarters: 1730 Chicago Ave., Evanston, Ill.

Women's Clubs, General Federation of.—Founded in 1890, this organization aims at uniting women's clubs throughout the world to promote education, philanthropy, public welfare, moral values, civics and fine arts. During 1956 emphasis was placed upon study of the historical foundations of religions of the world. Membership in 1956 included 850,000 individual paying members, with a total in affiliated organizations of about 11,000,000 in the U.S. and 58 other countries. Publication: *General Federation Clubwoman*, monthly. Officers (1956): Mrs. R. I. C. Prout, president; Chloe Gifford, first vice-president; Mrs. E. Lee Ozbirn, second vice-president. Headquarters: 1734 N St. N.W., Washington 6, D.C.

World Council of Churches.—Founded in 1948, this association's purpose, "through ecumenical fellowship and work and study programs, is to promote better understanding between churches and encourage them in their will toward Christian unity." The program of the council is co-ordinated through three main divisions: studies, ecumenical action, and interchurch aid and service to refugees. The council maintains contact with the United Nations through the commission of churches on international affairs. During 1956 special attention was given to a three-year study dealing with the church's responsibility in world areas of rapid social change. Member churches in 1956 totalled 165 in 47 countries, representing more than 160,000,000 persons. Publications: *Ecumenical Review*, quarterly; *Ecumenical Press Service*, weekly; *Ecumenical Courier*, bimonthly. In 1956 the basic budget was \$456,000. Council activities are guided by a central committee which met in 1956 in Galyatetö, Hung. Samuel McCrea Cavert was executive secretary in 1956. Headquarters: 17 Route de Malagnou, Geneva, Switz.; U.S. office: 156 Fifth Ave., New York, N.Y.

Young Men's Christian Association.—Founded in London, Eng., in 1844, this is a world-wide fellowship seeking to improve the spiritual, social, recreational and physical lives of young people. During 1956 there were 1,818 Y.M.C.A.'s operating in cities and rural areas, with memberships of 3,112,037. About 168,581 clubs, classes, teams, special interest groups and councils met regularly with programs emphasizing physical, educational, social and religious needs, plus emphasis on citizenship and world affairs. Among high school youth, 10,444 Hi-Y clubs for boys and 5,010 Tri-Hi-Y clubs for girls were functioning. Publications included *National Council Bulletin* and the *YMCA Year Book*. Endowments totalled \$61,173,600. Officers (1956): Clifford C. Gregg, president; Jay A. Urice, general secretary. Headquarters: 291 Broadway, New York 7, N.Y.

Young Women's Christian Association of the United States of America.—This organization was founded in England in 1855 and in the U.S. in 1858 to build a fellowship of girls and women devoted to the pursuit of Christian ideals in personal and social living. Reported registration in community Y.W.C.A.'s in 1956 totalled approximately 2,000,000. Publications: the *Bookshelf*; *YWCA Magazine*; and *Young Adults in the YMCA*. Officers (1956) included: Lilace R. Barnes, president; Mrs. F. Beardsley Foster, vice-president; Mrs. A. Hudson Sealy, secretary. Headquarters: 600 Lexing-

ton Ave., New York 22, N.Y.

Zonta International.—A service organization of executive women in business and the professions founded in 1919, this organization encourages high ethical business and professional standards, the improvement of the legal, political, economic and professional status of women, and international understanding through a world fellowship of executive women. Membership in 1956 included 335 clubs with approximately 12,000 members in the U.S. and 12 other countries. During 1956 two Amelia Earhart graduate scholarships were awarded. Publication: *Zontian* (magazine). Officers (1956-57) included: Emma L. Conlon, president; Ellen Fireoed, executive secretary. Headquarters: 59 E. Van Buren St., Chicago 5, Ill.

Sociology. The year 1956 was characterized by growth in areas that had been dormant for some time or that had not been cultivated intensively. Most developments could be viewed as worthwhile, although sharp criticism was by no means lacking.

Perhaps the sharpest criticism was offered by Pitirim Sorokin in his *Fads and Foibles in Modern Sociology and Related Sciences*. His attack was over a wide front, but was chiefly centred on disregard of past achievements, jargon, operationism and natural-science imitation, poorly conceived and misused tests, over-elaborate mathematical procedures, spurious experimentation, trivial small-group studies, platitudes hailed as epoch-making discoveries, undue stress on prediction and failure to deal with societal and cultural systems as such. Not all of the criticism could be viewed as relevant or valid.

Criticism interspersed with a great deal of value judgment, and obscured for many readers by the fascinating content of the book, was contained in C. Wright Mills' *The Power Elite*. Mills charged contemporary sociologists with absorption in trivial issues to which, because of their limited range, "rigorous" techniques of investigation could be readily applied; or, putting it more drastically, with choosing topics for investigation not for their real importance but for their amenability to currently approved practice.

Contemporary in emphasis, the procedures used in Mills' study could nevertheless be viewed as adapted, in their sounder aspects, to the use of historical evidence for sociological purposes, since the point at which the past begins is always a matter for more or less arbitrary decision, and "history" is not exclusively the concern of the professional historian. Accordingly, the American Sociological society, at its annual September meeting, devoted one section session to sociology of history. Historians having sociological inclinations, and sociologists utilizing data commonly viewed as historical, were among the participants. Issues were sharply drawn, one historian accusing sociologists of having little to offer because of unsuitable techniques, and one sociologist asserting that all generalization about social affairs, past or present, is the special preserve of the sociologist under whatever name. In spite of such contrasts, however, the section session proved worthwhile, and the hope was expressed that at future annual meetings such a section would not only be continued but also expanded. Mention was made of the new *International Journal of Social History*, published in the Netherlands, as a possible medium for at least some of the papers that might be presented.

Sociology of religion, a field of research and instruction to which relatively little effort had been devoted in recent years, showed signs of revival in many countries, among them the United States and France. This was revealed in several significant articles, as well as in the lists of research projects, theses and dissertations published in American sociological journals during the year; in active French participation in journal publication; and in the sections on sociology of religion held at the third International Congress of Sociology, meeting at Amsterdam, Neth., in August. A symposium, *Modern Sociological Theory in Continuity and Change*, contained a valuable chapter on sociology of religion, with an excellent bibliography, by the German social scientist, Paul Honigsheim.

Pervading the various studies on sociology of religion was the effort to construct usable typologies of religious organizations; cult, sect, denomination, ecclesia and the like all figured prominently. Similar concern with adequate typology was also to be observed in urban sociology. This field, after the decline of so-called human or social ecology, had suffered eclipse, but during the year many signs of renewed interest appeared. The sociology of work, chiefly as viewed in its urban setting, also enjoyed some popularity, especially at The University of Chicago under E. C. Hughes, where it was conveniently paired with the sociology of leisure under David Riesman. In the *American Journal of Sociology*, an issue featuring sociology of work included an excellent article on the typology of work leadership. The use of "typology" as a mere substitute for "classification" pointed, in a few instances, to failure to observe the cardinal principle of good typological procedure; namely, to develop types only in conjunction with (1) a clearly posed question; (2) a culture case study aimed at securing a tentative answer; (3) formulation of a definite hypothesis and its related types; and (4) proper validation of the hypothesis by all suitable methods of causal inference.

Some of the year's work in rural sociology followed good typological practice; the article on Latin-American communities by C. P. Loomis and J. C. McKinney, in the March number of the *American Journal of Sociology*, was a commendable example. Not explicitly typological, but affording a good basis for reformulation in such terms, was the book by W. M. Williams, *Gosforth: the Sociology of an English Village*. Since the general topic of the third International Congress of Sociology was social change, many studies of rural societies undergoing change were presented. Several of these, in their orientation toward some well-defined body of sociological theory, provided a refreshing contrast to the naïve collections of raw data which passed as rural sociology in the United States a generation before, and in some circles even in 1956. A Dutch book combining zeal for fact gathering with sound theory in rural sociology was I. Gadourek's *A Dutch Community: Social and Cultural Structure and Process in a Bulb-Growing Region in the Netherlands*. The German journal of rural history and sociology, *Zeitschrift für Agrargeschichte und Agrarsoziologie*, continued to present articles of high quality.

During 1956 social change continued to hold the attention of sociologists everywhere. Social change was selected as the topic for the third International Congress of Sociology and many of the papers making up the *Proceedings* of the congress (published in advance) were of first-rate quality. The general interest in social change evoked defensive reactions among the adherents of structural-functional analysis, which is difficult to apply to problems of social change without begging crucial questions. This defensiveness was especially evident in the article by Bernard Barber in the April 1956 number of the *American Sociological Review*. In the May number of *Social Forces* the structural-functional approach was the subject of an article which was not defensive but critical, "Position, Role, and Status: a Reformulation of Concepts," by Frederick M. Bates.

Among other important topics considered in *Social Forces* was that of sociological field work, particularly in the October number. Anthropologists had long stressed the necessity of living as a participant observer with the people being studied, and in an earlier period sociologists also had followed this practice. Of recent years, however, sociologists had tended to restrict their efforts to the more formalized techniques. In 1956 this restriction was challenged in the two aforementioned *Social Forces* articles, both by sociologists who had themselves carried out extensive field investigations.

The year was a presidential election year in the United States, and various polls and highly publicized computing devices were

much in evidence. Made wary by the debacle of 1948, when Pres. Harry S. Truman triumphed in spite of poll predictions, most polling organizations severely qualified their forecasts of an Eisenhower victory. By contrast, the searching one-man analyses of Samuel Lubell, based on field studies, not only flatly predicted an Eisenhower sweep, but also correctly forecast in detail the anomaly of a Democratic house and senate victory, district by district and state by state.

Sociological societies throughout the world were active. Among the several new organizations was the Scottish branch of the British Sociological association which held a two-day conference in Edinburgh in April. The third International Congress of Sociology provided a prominent place for reports on the teaching of sociology and the professional activities of sociologists; Austria, Belgium, Canada, Finland, the Netherlands, Poland, Turkey and Venezuela were included in one collection, and research going on in Austria, Finland, France, Great Britain, Israel, Norway, Poland and Sweden was considered in another.

The Helen DeRoy award of the Society for the Study of Social Problems went to Reuben Hill, J. Mayone Stycos and Kurt W. Back. The MacIver lectureship of the American Sociological society was granted to E. Franklin Frazier for his book, *Bourgeoisie Noire*. (H. BEC.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Centralization and Decentralization* (1952); *Cities—How They Grow*, 2nd ed. (1953); *The Baltimore Plan* (1953); *Food and People* (1956); *Inside Story* (1952); *The Living City* (1953); *Man and His Culture* (1954); *Political Parties* (1952); *Presidential Elections* (1952); *Pressure Groups* (1952); *Public Opinion* (1946); *The Social Process* (1952); *Social Revolution* (1952); *Wastage of Human Resources* (1947).

Sodality of Our Lady: see SOCIETIES AND ASSOCIATIONS, U.S.

Softball. The Clearwater (Fla.) Bombers regained the championship of the Amateur Softball association by winning the annual world tournament at Sacramento, Calif., in Sept. 1956. The Bombers, who had been dethroned by the Raybestos Cardinals of Stratford, Conn., the year before, swept through the championship series with five victories in five starts. Clearwater clinched the title by routing the Raybestos team, 14-9, in the final. In their march to the title, the Floridians also beat San Diego (Calif.) Anderson Furniture, 6-0; Montreal (Que.) Fisher Brothers Tomato Kings, 6-0; Meenan Oilers of Levittown, N.Y., 2-1, and the Raybestos Cardinals, 2-1. The award to the most valuable player of the championship went to Harvey Sterkel of the Sealmasters of Aurora, Ill. In 51 innings of hurling, Sterkel struck out 97, allowed 16 hits and walked 5 batters.

A record field of 36 teams was attracted to the fourth annual slow-pitch tourney at Cleveland, O., necessitating a division of entries into open and industrial classes. The Gatliff Auto Sales team of Newport, Ky., won the open title, beating the defending champion, Lang's Pet Shop of Covington, Ky., in the final, 2-1. The Cincinnati (O.) Fire Department team carried off honours in the industrial division.

The Orange (Calif.) Rock Products Lionettes retained women's world laurels at Clearwater, sweeping past six rivals in tournament competition. Nonie Hoehn and Teddie Hamilton turned in no-hitters for the five-time champions. Bertha Ragan of the Raybestos Brakettes of Stratford, Conn., was chosen most valuable player. (T. V. H.)

Soil Bank: see AGRICULTURE; FORESTS; SOIL CONSERVATION.

Soil Conservation. Studies of plants and their environment, preliminary to solving some of the more puzzling soil conservation problems, was an important

feature of the conservation movement from the world viewpoint during 1956. Ecological studies and vegetation classifications, to determine present soil and water conditions, and to indicate first steps toward restoring the soil's native fertility, were reported from several African countries, the middle east, India, Australia and New Zealand. In the last two countries and in the United States, the ecological method was in practical use for range improvement, the objective being to restore and preserve the climax vegetation.

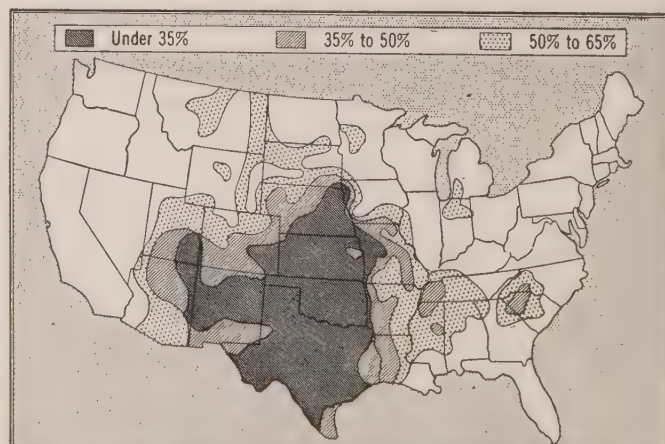
Aside from improvement of range and pasture, there were many other needs for handling problems solvable only by using the right plants in the right places. Widespread adoption of such essential practices as rotation of crops, use of green manure crops, barrier plantings for wind erosion control, protection of embankments and gully heads, dune fixation and cover crops for moisture absorption had served as an incentive to the ecological studies with special emphasis on conservation of soil and water. A list of 101 native plants valuable for soil cover and erosion control in Africa south of the Sahara was compiled and published by the Inter African Bureau for Soils and Rural Economy during the year.

Drought in many parts of the world focused attention on soil and water relationships in irrigation. Subjects selected for study by the Third International Congress on Irrigation included moisture movement in irrigated soils; special methods for preservation of soil structure and the conservation of soil fertility; and the effects of soil fertility on irrigation water. Production by use of irrigation expanded most rapidly in the United States, Australia, India and Mexico.

Brief summaries of some important accomplishments in soil and water conservation in various parts of the world are given in the following:

United States.—Under state laws, the people had organized 2,721 conservation districts including about 91% of all the farms and ranches in the country. Sixteen states, and Puerto Rico and the Virgin Islands, were completely covered by the districts, while 18 other states were from 90% to 99% covered. About 35% of all farmers and ranchers in the districts were co-operating actively in the program to apply soil and water conservation to their land.

Complete conservation plans had been prepared, by technicians of the soil conservation service working with farmers and ranchers, for 1,102,804 farms and ranches with a total area of nearly 307,000,000 ac. During 1956, 89,262 new plans were compiled for farms totalling 27,000,000 ac., while 8,770 plans were revised to conform with changed conditions. Work plans for 180 watersheds covering more than 7,000,000 ac. also were completed.



U.S. DROUGHT CONDITIONS in the fall of 1956, shown in percentages of normal pasture feed supply. Areas in white were relatively unaffected. From U.S. department of agriculture data

Soil surveys suitable for conservation planning were made on 31,500,000 ac. during the year, and range site and condition surveys were completed on nearly 11,000,000 ac. of rangeland. This brought the total area surveyed for conservation purposes to 564,000,000 ac., of which nearly 56,000,000 ac. was Great Plains and western range used solely for livestock grazing.

The figures given in the table show some of the major soil and water conservation practices applied to farm and range land in soil conservation districts as of July 1, 1956, with estimates of acreages needing similar treatment but not yet treated.

Conservation Practices Applied in Soil Conservation Districts

Conservation practice	Total applied as of July 1, 1956	Remaining to be applied (preliminary estimates)
Conservation crop rotations (ac.)	54,255,000	181,000,000
Contour farming (ac.)	32,736,000	110,000,000
Cover cropping (ac.)	19,438,000	60,000,000
Strip cropping (ac.)	13,815,000	56,500,000
Seeding range and pasture (ac.)	28,384,000	101,000,000
Tree planting on farmland (ac.)	3,883,000	24,000,000
Farm areas improved for wildlife (ac.)	3,665,000	12,400,000
Drainage of farmland (ac.)	17,585,000	66,000,000
Land levelling for irrigation (ac.)	4,493,000	15,000,000
Conservation water use in irrigation (ac.)	7,470,000	17,000,000
Terracing of cropland (mi.)	1,045,000	4,670,000
Water diversion ridges and channels (mi.)	58,500	402,000
Pond construction (no.)	748,617	1,500,000

A national inventory of soil and water conservation needs was begun during the period to provide additional and more accurate information on the extent of the conservation job remaining to be done. The inventory was to be developed for each county in the United States and for appropriate subdivisions of the territories. As planned, it would provide basic facts about the amount and kinds of soil, water and plant resources as well as a realistic estimate of treatments needed to protect and improve these resources. The goal for actual making of the inventory was three years.

Legislation to strengthen the national soil and water conservation program was passed by the 84th congress. Amendment of the Watershed Protection and Flood Prevention act liberalized provisions of the act to broaden the scope of water conservation activities. Federal assistance was provided for watershed projects that include municipal and industrial water supply development, as well as those involving upstream flood prevention, irrigation and other phases of agricultural water management. The amendments also increased the maximum size of dams and reservoirs for upstream protection, extended benefits of the program to Alaska, Hawaii, Puerto Rico and the Virgin Islands, and permitted retroactive application of the new provisions to watershed projects that were already underway. As of Sept. 1, 31 watershed projects had been authorized for operation under the act, and 200 more were in the planning stages. Soil conservation districts sponsored all the projects. The soil conservation service continued to administer the federal assistance program.

New legislation in the form of an amendment to the Soil Conservation and Domestic Allotment act and the Agricultural Adjustment act of 1938, authorizing a special Great Plains Conservation program, was signed by Pres. Dwight D. Eisenhower on Aug. 7. Under this amendment, the department of agriculture may enter into 10-year contracts, based on conservation plans, with Great Plains farmers and ranchers to provide them with cost-sharing as well as technical assistance. The new provisions were intended to give land users adequate time for making the needed land-use changes, rehabilitating denuded ranges and for applying suitable erosion control practices on cropland subject to drought, soil blowing or erosion caused by sudden heavy rain storms. The bill authorized a maximum of \$150,000,000 for the entire program, with not more than \$25,000,000 to be spent on the program in any one year. Between Nov. 1, 1955, and June 1, 1956, nearly 10,000,000 ac. in the Great Plains were damaged by wind erosion.

Steps were taken immediately to implement the Great Plains program. Soil survey work for land classifications was intensified, especially on cropland in the critical wind erosion areas. Such surveys had been completed on 42,000,000 ac. in the region. At the same time a cost-sharing plan was set up in the department of agriculture to help farmers in applying those conservation practices essential to a long-range program to safeguard the land of the 10 Plains states. It was estimated by the soil conservation service that from 11,000,000 to 14,000,000 ac. of cropped land in the region should be converted to grass or other permanent vegetative cover if the region was to be kept productive and subject to only minimum damage from drought, floods and depletion of fertility by misuse. At the beginning of 1956, 63% of the farmers and ranchers in the Great Plains were co-operating in the programs of soil conservation districts.

The Soil Bank act, passed by the U.S. congress May 28, as Title I of the Agricultural act of 1956, included features intended to contribute to soil and water conservation. It set forth a long-term Conservation Reserve program offering all farmers and ranchers income protection while making needed adjustments in land use. While its first purpose was to reduce the volume of production of crops in surplus, it was considered important as a conservation measure in that it specified that land retired from crop production must be planted to grass or trees, or used for water storage facilities such as lakes and ponds. Payments to help defray costs of establishing conservation practices on the designated acreage were made available to farmers and ranchers contracting to take advantage of the opportunity.

Latin-American Countries.—Studies were made of the Llanos of Venezuela, about one-third of the country, to determine the extent of deterioration of that vast tropical savannah and to attempt to devise ways to restore at least a measure of its original value for grazing. It was found that the Llanos was no longer supporting nutritious grasses. Livestock carrying capacity had decreased about one-half, and many areas were subjected yearly to serious soil erosion and alternate floods and drought which killed large numbers of cattle. The government had taken initial steps to correct the situation but faced great difficulty because of lack of knowledge concerning the conservation practices needed. Artesian wells had been drilled in many places, and several hundred large ponds had been constructed to carry livestock through the dry season. Experiments had shown that the introduced perennial, kudzu, offered considerable promise for good pasturage. The government was attempting to stop, or lessen, the systematic burning of the inferior grasses, in the hope that better forage plants would revive naturally.

In El Salvador, the soil conservation section of the ministry of agriculture was providing technicians to assist farmers in erosion control on all types of land. Work in progress included terracing for cultivation of fruits, water diversion for cotton cultivation, planting of living fences, and the making of rotation plans for sugar cane and cereal farms. A type of terrace suitable for cultivation of maize and zacate (forage crops) was worked out, and a guide for making land capability surveys was completed and ready for use.

In Uruguay a division for conservation was established in the ministry of agriculture. Soil conservation demonstrations on sloping land in Rio Negro department featured contour strip cropping, adapted rotations, cover cropping, grass waterways and restoration of eroded grazing land by seeding and controlled grazing.

Important steps were taken in Argentina to halt land damage by wind erosion in the semiarid region, about 50,000,000 ac., lying between the Colorado and Paraná rivers. Survey of the region by the Instituto de Suelos y Agroecnia revealed that more than 11,000,000 ac. were severely eroded, with active dunes

and loss of more than 25% of the original soil. Nearly 18,000,000 ac. were moderately eroded, with dune formation starting. The Estación Experimental de Anguil, in the state of La Pampa, and Estación Experimental de Manfredi in Córdoba were assigned responsibility for introducing suitable conservation practices and providing technical assistance to farmers and ranchers. The first soil conservation district in the region was organized in La Pampa, under the state's law decreeing a soil conservation program for all lands. Stubble mulch farming of grain land had proved effective in the northern part of the region subject to wind erosion.

Africa.—A soil, vegetation and erosion survey was made of the Ubangi-Shari region of French Equatorial Africa, an area long used by human beings. Natural vegetation was found to have changed drastically, especially in the savannahs, owing to deterioration of soils resulting from misuse without any attempts at conservation.

The agriculture department of Northern Nigeria reported a survey of land use in the Kano province where rainfall averages 30 to 40 in. annually. Only in the central zone were native farmers using any conservation practices. There, a system of permanent cultivation was the rule, with manuring and composting, intercropping which appeared to protect the soil, but no semblance of crop rotations.

In Mozambique, East Africa, owners of large plantations had adopted contour farming on a wide scale, especially for production of tobacco. In Zambezi province, contour planting of tea, in areas carefully selected by land capability studies, had begun to produce greater yields than were ever before realized. About 30,000 ac. had been contour planted.

The successful soil and water conservation program of Southern Rhodesia, developed over the last 15 years to deal with the country's peculiar conditions, was being studied as a model by conservationists from many other parts of Africa where primitive or nearly primitive peoples occupy vast areas of land. In Rhodesia, the work of applying conservation to land farmed by Europeans had been virtually completed. Sixty percent of all plowed land was protected by contour ridges and storm drains where needed. Thousands of water storage dams had been built, and all gullies and roadside erosion had been eliminated. Yield of maize had increased more than sixfold and other crops showed similar gains.

The difficult problem of extending soil and water conservation to native reserves appeared to have been solved in Rhodesia, through educational programs, demonstrations and sympathetic leadership. At the beginning of the year, responsibility for controlling erosion in native reserves was transferred from the department of native agriculture into the hands of the native cultivators themselves. This was done by implementing the Native Land Husbandry act which permits division of reserve lands into individual holdings, loans and grants-in-aid, and formation of intensive conservation areas (soil conservation districts) by native farmers.

Europe.—A soil erosion survey of Poland showed that 20% of the land of the country was subject to erosion and required control methods suited to rolling or highland terrain. The areas most severely eroded were the Carpathian and Sudety piedmonts, the Slask-Malopolska highland, the Kocie Córy hillock, the Lublin highland, the Northern Lake district, and local rolling and hilly moraine areas and river valley slopes within the belt of the Great Valley and the Baltic shoreline. A demonstration farm in the Lublin upland, including strip cropping, tree barrier plantings, and gully control by use of vegetative plantings, was proving successful for enlisting interest of farmers. Yields on the demonstration lands were twice as high as those obtained before introduction of erosion control practices.

A program to improve about 10,000,000 ac. of agricultural land in southern Italy, including parts of Sicily, was launched by banking and business interests of the country. The project started with bench terracing on steep slopes and supporting water-control methods, irrigation systems and production of fertilizers needed in the region.

(See also DAMS; IRRIGATION.)

(DD. A. W.)

ENCYCLOPÆDIA BRITANNICA FILMS—*Big Harvest* (1955); *Birth of the Soil* (1948); *Our Soil Resources* (Formation and Conservation) (1947); *Seeds of Destruction* (1948); *This Vital Earth* (1948).

Solar System: see ASTRONOMY.

Solomon Islands: see PACIFIC ISLANDS, BRITISH; TRUST TERRITORIES.

Somalia. This Italian trust territory in East Africa is bounded southeast by the Indian ocean, west by Kenya and northwest by the Somaliland protectorate and Ethiopia. Area: 198,275 sq.mi. Pop. (1954 est.) 1,269,000, including 30,000 Arabs, 1,000 Indians, 4,858 Italians and 139 other Europeans. Chief Somali tribal groups: Darot, Hawiya, Rahanuin, Dighil, Dirr and Tunni (nomadic or seminomadic pastoralists). Religion: Sunni (Shafi) Moslem. Capital: Mogadishu, pop. (1953 est.) 63,000. Administrator in 1956, Enrico Anzilotti.

History.—The first general election ever held in Somalia took place on Feb. 29, 1956. Of the 60 seats in the legislative assembly, the Somali Youth league (advocating the unification of British, French and Italian Somalia) obtained 42 seats, while 13 seats went to the Hizbia Dighil Mirifle (a party favouring the retention of tribal organization). The legislative assembly was inaugurated on April 27, Benjamin Cohen representing the secretary-general of the United Nations.

The UN Trusteeship council received complaints that Egyptian propagandists were exercising political pressure against the inhabitants of Somalia. The objective was to woo the territory toward membership of the Arab league as soon as it attained independence (scheduled for 1960). This accusation was denied by Kamal-ed-Din Salah, Egyptian member of the UN Advisory council in Somalia.

(See also TRUST TERRITORIES.)

Education.—Schools (1954-55): primary (including nursery and adult) 232, pupils 23,346, teachers 420; secondary (including 1 teachers' training school with 37 students; other vocational in parentheses): 23 (13), pupils 1,328 (575), teachers 119 (65, excluding Italian commercial school). Institute of legal, economic and social studies (1955): students 45, teachers 4.

Finance and Trade.—Monetary unit: somalo (=14 cents U.S.). Budget (1955): revenue 99,956,000 somali, expenditure 99,956,000 somali.

Foreign Trade.—(1955) Imports 100,843,000 somali, exports 73,479,400 somali. Chief exports: bananas, hides and skins, cotton.

Somaliland, British: see BRITISH EAST AFRICA.

Somaliland, French. This overseas territory of the French union in the Gulf of Aden is bounded north, northwest and southwest by Ethiopia and southeast by Somaliland Protectorate. Area: 8,494 sq.mi. Pop. (1955 est.): 63,700, including 28,000 Somalis, 25,000 Danakils, 6,000 Arabs, 3,132 Europeans. Capital, Jibuti, pop. (1955 est.) 31,855. Governor in 1956, René Petitbon.

History.—On Jan. 2, 1956, Farah Hamud Harbi was elected a member of the French national assembly. He suggested lightening the local budget by instituting a special fund for the port of Jibuti.

On May 14 a demonstration by the unemployed led to clashes with the police, in the course of which people were injured. A general strike broke out in August and went on for 20 days.

The closing of the Suez canal at the beginning of November sorely tried the economy of the territory by reducing considerably the maritime traffic which is its chief resource. The terri-

tory lacked supplies and its budget was forced to rely on subsidies from the central government.

The native councillors refused to take their seats in the representative council.

(HU. DE.)

Education.—(1954-55) Public and private schools 23, pupils 2,103, teachers 66.

Foreign Trade.—(1955) Monetary unit: Jibouti franc=1.64 metropolitan French francs, U.S. \$1=350 metropolitan francs. Imports 2,324,000,000 Jibouti fr., including 870,000,000 Jibouti fr. from France; exports 2,727,000,000 Jibouti fr., including 2,474,000,000 Jibouti fr. in provisions for ships.

South Africa, British: see BRITISH SOUTH AFRICAN TERRITORIES.

South Africa, The Union of. A realm of the Commonwealth of Nations, the Union of South Africa extends from the southernmost point of the African continent northward to the Limpopo, Molopo and western Orange rivers. The mandated territory of South-West Africa is administered by South Africa. (See also TRUST TERRITORIES.)

Province	Area (sq.mi.)	Population (1951 census)	Capital (total and European pop., incl. suburbs, 1951)
Cape of Good Hope	278,839*	4,426,726	Capetown (577,211; 247,442)
Natal	33,578	2,415,318	Pietermaritzburg (74,407; 32,139)
Orange Free State	49,866	1,016,570	Bloemfontein (109,180; 49,074)
Transvaal	110,450	4,809,145	Pretoria (283,535; 151,400)
Total, Union of			
South Africa	472,733†	12,667,759‡	
South-West Africa	317,725	414,601§	Windhoek (20,490; 10,246)

*Including Walvis Bay (374 sq.mi.) an enclave of Cape province administered with South-West Africa. †Excluding Marion Island (about 85 sq.mi.) and Prince Edward Island (about 18 sq.mi.), subantarctic dependencies. ‡European 20.9%, African 67.5%, Asian 2.9% (mainly in Natal), coloured (mixed) 8.7% (mainly in Cape). §Including 48,588 Europeans.

Total pop. (1955 est.): Union, 13,669,000; South-West Africa 458,000. Official languages (1951, Europeans only): 73% spoke Afrikaans and English, 15.3% English only, 11.4% Afrikaans only; Africans, generally Bantu (Xhosa, Zulu, Swazi, etc.). Adherence to the most important religious groups was as follows:

	European (%; 1951)	Coloured (%; 1946)	African (%; 1946)
Dutch Reformed	53.2	31.5	3.4
Anglican	15	20.0	7.1
Methodist	8.2	9.7	12.9
Roman Catholic	5.3	6.0	4.3

Also Europeans 4.1% Jewish, 3.6% Presbyterian; coloured 10.8% Congregational; Africans 9.7% members of native separatist churches, 5% Lutherans; Asians 63.2% Hindu, 21.5% Moslem. Of non-Europeans, 51% were Christian.

Capetown is the seat of the legislature, Pretoria that of the government and Bloemfontein that of the supreme court. Other principal towns, including suburbs (total pop. and European pop., 1951): Johannesburg (880,573; 359,477); Durban (476,236; 151,111); Port Elizabeth (188,892; 78,670); Germiston (166,310; 71,572); Springs (119,392; 31,588); East London (91,190; 43,946). Queen, Elizabeth II. Governor general in 1956, Ernest George Jansen. Prime minister, J. G. Strijdom.

History.—**Legislation.**—The 1956 parliamentary session lasted, as usual, from January until June. After a joint sitting of both houses, the bill amending the constitution was passed by 174 votes to 68. The necessary two-thirds majority had been assured by the reform of the senate in 1955 and the new measure removed about 50,000 Cape coloured voters from the common electoral roll. They were transferred to a special communal roll and would in the future elect four white members to the house of assembly. The passage of this bill ended the constitutional crisis that had continued for several years. The Cape provincial division of the supreme court upheld the validity of the act reforming the senate and the appeal court, which had itself been reformed, in fact confirmed this decision late in the year. The amending bill abolished the entrenchment that had hitherto protected the franchise rights of non-Europeans, but the bill did not impair the entrenchment requiring a two-thirds majority for

an alteration in the equality of the two official languages, Afrikaans and English.

The senate was dissolved late in 1955 and indirect elections were held under the new system. As a result 27 senators were elected for the Transvaal province, 22 for the Cape province, 8 for the Orange Free state, 8 for Natal and 2 for South-West Africa. Four were elected by Africans and 18 were nominated by the government, which held all but 12 of the total 89 seats.

In spite of continued opposition from the trade-union movement, the Industrial Conciliation act was passed. This measure prohibited the continuance of unions with mixed membership of white and coloured or Indian workmen. No more such unions would receive legal recognition in the future and existing unions would have to divide on racial lines. Strikes of any kind were prohibited in various circumstances, and trade unions were forbidden to affiliate or give financial support to any political party or candidate. The minister of labour was given far-reaching powers to reserve certain types of work in any industry for persons of a specified race. The government claimed that this was a safeguard against interracial competition for jobs. Opponents of the whole measure feared that it would seriously weaken the trade unions, especially in manufacturing industry, and that it would cause labour unrest. Other new laws that evoked public controversy restricted the personal freedom of Africans. Local authorities were empowered to banish individual Africans from municipal areas, a power hitherto reserved to the central government. The supreme court was denied jurisdiction in all banishment cases until after the order had been obeyed by the individual concerned.

The cabinet was reshuffled. Eric H. Louw resigned as minister of finance in order to devote himself wholly to his other portfolio of foreign affairs, including the supervision of the expanding state information office. He was succeeded by J. F. Naudé, who had been minister of health, the latter office being taken over by J. H. Viljoen, minister of education. The salary of members of parliament was raised from £1,400 by an allowance bringing it to £2,000.

Economic Position.—The budget, introduced in March, showed total estimated expenditure for the ensuing year at £277,000,000 and total revenue at £278,000,000. On capital works further expenditure of £96,000,000 was estimated. Various tax concessions were announced. A new formula for the taxation of the gold mines resulted in a saving of £700,000 to the industry; and ultradeep mines were to receive special encouragement. Income tax was reduced for a large group of taxpayers by raising the level of supertax from £1,775 to £2,300. In the past year the Union's economy had shown its inherent strength, according to finance minister Eric H. Louw. Inflation had been checked. An increasing part of the government's capital expenditure was being met from South Africa's own resources, with minimum dependence on loans from abroad.

At the 36th annual meeting of stockholders of the South African reserve bank the deputy governor, E. H. D. Arndt, reviewed recent monetary policy. After years of exceptionally rapid economic expansion, he said that the Union's economy seemed to be returning to more normal conditions. There was, however, no evidence of incipient depression. The net capital inflow from abroad had declined and the balance of payments continued to show a deficit (£15,000,000 for the first half of 1956), but improvement was expected later in the year. As a precaution, a limited control over the transfer of Union funds to sterling countries was instituted.

The Union's first attempt to raise a public loan in the United States was a remarkable success. The loan of \$25,000,000 was immediately oversubscribed. A similar loan was made by the International Bank. Before the loan was issued, the U.S. firm of

underwriters, Dillon, Read and Co., made a detailed survey of South Africa's financial position and prospects. This survey revealed that the net national income in 1955 rose to £1,457,000,000 (apart from £176,000,000 going outside the Union). To this total, manufacturing industries contributed £386,000,000; trade and commerce £218,000,000; agriculture £245,000,000; gold mining £136,000,000, and other mining £62,000,000. U.S. private capital investment, small in comparison with British investment in the Union, was nevertheless important. It amounted to £69,000,000 and was increasing substantially, said the survey.

Race Relations.—Controversy was stirred by the publication of the report of the commission on the socioeconomic development of the Bantu areas (known as the Tomlinson report). After a comprehensive inquiry, the commission, which consisted of specialists sympathetic to the idea of total *apartheid*, produced, in elaborate detail, a plan for the separate economic and social development of the existing native reserves. In order to achieve a diversified economy, the report envisaged the emergence of a Bantu farming class securely settled on units big enough to ensure a living from the land. Those Africans who could not obtain a livelihood from agriculture must be removed and encouraged to live in an industrial and urban life, but within the reserves. The report did not contemplate the purchase of much more land for African occupation but the better use of land already held. The cost of the whole scheme for the first ten years of the program was estimated at £104,000,000, about half of which would probably be recoverable. In a white paper, the government, while accepting the general principles of the report, rejected some of its main proposals. Among these was the substitution of individual for tribal land tenure. It also rejected the establishment within the reserves of European-owned industries, holding that the Bantu should try to develop their own industries. As a result of the report, however, parliament voted an additional £3,500,000 for the development of the reserves in the ensuing year. At a big conference called by representative Afrikaner organizations, the report was welcomed and the government was urged to implement it even if that involved sacrifices from Europeans. Another big conference of leading Africans rejected the report, demanding rights of citizenship instead.

A beginning was made with the extension of the pass laws to African women. In protest against this measure, 10,000 African women travelled to Pretoria on Aug. 9 in a nonviolent demonstration held at the Union buildings, the administrative centre of the government. On various occasions during the year the police were in conflict with urban Africans mainly on account of the enforcement of the pass and allied laws. In 1955 the number of Africans convicted under these laws rose to the record figure of 337,603. The African national congress adopted a "charter of freedom" demanding various human rights. Banishment from certain areas was imposed on a number of African political leaders and teachers. The classification of nonwhite people into ethnic groups encountered difficulties with marginal persons whose race administrative tribunals found it hard to decide. A new law made physical appearance the sole test of race in doubtful cases. The system of racial zoning in urban areas began to be applied on the Rand and in the Cape peninsula amid protests from the Indian and coloured communities who were specially affected. Their new limited areas for residence and trade were held to be inadequate and the zoning system threatened economic dislocation.

Commonwealth Relations and External Affairs.—The prime minister, J. G. Strijdom, in July paid his first official visit to Great Britain on the occasion of the Commonwealth conference. He declared that it was the government's policy ultimately to establish a republican form of government in South Africa should a sufficiently large number of voters support such a step; but a republic, he said, would in no way affect South Africa's policy

of co-operation with Great Britain and other commonwealth countries. He assured British investors that their capital would be safe in the Union, that they would find investment profitable, and that capital would be repatriated at will.

The consulates of the U.S.S.R. in Pretoria and Capetown were closed in Feb. 1956 at the request of the Union government, which alleged that members of their diplomatic staff had maintained contact with subversive elements, especially among the Africans and Indians. In December a number of persons were arrested and charged with treason. (Ju. L.)

Education.—European schools under provincial control (1955): primary 2,170, intermediate 18, high schools 141, secondary and all-age schools 344; (1951, all schools) pupils 1,668,000, teachers 49,600. Vocational: European state vocational schools (1955) 42, pupils 58,500; technical institutes 11; agricultural colleges 5. Teacher-training colleges (European, 1955) 13, (non-European, 1948) 55; students (all races, 1951) 10,291. Non-European schools (1953) 5,346, pupils (1955) 900,000. Private schools (all levels, 1950): European 284, non-European 672. Universities (1955) 9, students (including external) 24,703. Nonwhite students about 3,000. University college of Fort Hare (for Bantu), 374 students.

Finance and Banking.—Monetary unit: South African pound at par with the pound sterling and with an exchange rate of £(S.A.) 0.35 to the U.S. dollar. Budget (1956–57 est.): revenue £(S.A.) 283,350,000 (on basis of existing taxation), expenditure £(S.A.) 276,950,000. Total public debt (Dec. 1955) £(S.A.) 960,197,000 of which £(S.A.) 74,831,000 external. Currency circulation (Dec. 1954) £(S.A.) 471,300,000. Bank deposits (Dec. 1954) £(S.A.) 335,200,000, (Dec. 1955) £(S.A.) 315,700,000. Gold and foreign exchange, official holdings (April 1955) U.S. \$392,000,000, (April 1956) U.S. \$326,000,000.

Foreign Trade.—(1955) Imports £(S.A.) 485,200,000; exports £(S.A.) 385,000,000. Main sources of imports: U.K. 34%; other sterling area 11%; U.S. and Canada 25%; continental E.P.U. (European Payments union) countries 18%. Main destinations of exports: U.K. 34%; other sterling area 20%; continental E.P.U. 21%; U.S. and Canada 8%. Main exports: wool 16%; diamonds (1954) 4%; re-exports 10%.

Transport and Communications.—Roads (1955) 316,640 km. Motor vehicles in use (1954): passenger 561,078; commercial 161,130. Railways (1954): 21,600 km.; freight ton-km. 22,960,000,000. Shipping: merchant vessels of 100 gross tons and over (July 1955): 138; total tonnage 160,623. Air transport (1954): passenger-km. 329,786; cargo, ton-km. 8,139. Telephones (March 1955) 613,525. Radio receiving sets (1954) 717,000.

Agriculture.—(On farms and estates only, except as indicated.) Main crops (metric tons, 1955; 1954 in parentheses): wheat 664,000 (642,000); maize 2,920,000 (3,299,000); barley (1954) 61,000; sorghum (1954, total crop) 145,000; oranges and tangerines 289,000 (279,000); grapefruit 14,000 (14,000); lemons 4,000 (3,000); (1953): potatoes (total crop) 184,000; (1954): groundnuts (peanuts) 189,000; sunflower seed 47,000; tobacco 17,200; raisins 10,500; dry beans 30,000; grapes 504,000. Live-stock (Aug. 1954) cattle 11,604,249; sheep 37,141,579; pigs 491,140; goats 5,407,171; poultry (Sept. 1953) 15,725,000; horses (Sept. 1951) 676,000. Miscellaneous production (metric tons, 1955): cane sugar, raw value 842,000; wool 65,000; meat 388,000, of which beef and veal 259,000; butter (factory) 35,520; cheese 12,000; milk (1954) 2,102,000; wine (1954) 2,850,000 hectolitres. Fish landed (1953): 374,000 metric tons.

Industry.—Fuel and power (1955): coal 32,256,000 metric tons; electricity 16,416,000,000 kw.hr. Production (metric tons, 1955): iron ore (60–65% metal content) 2,004,000; pig iron 1,300,800; crude steel 1,584,000; copper, smelter 42,840; cement 2,336,400; asbestos 108,817; gold 14,602,267 fine oz.; diamonds 2,636,900 metric carats; ores (metal content, 1954): chrome 597,000 short tons; tungsten 367; antimony 8,639; manganese 647,000 short tons. New dwellings completed in 18 principal urban areas (1955) 15,396. Index of employment (1954; 1948=100) 125, (1953) 123.

ENCYCLOPÆDIA BRITANNICA FILMS.—*The Union of South Africa (Its Land and Its People)* (1956).

South America: see ARGENTINA; BOLIVIA; BRAZIL; BRITISH GUIANA; CHILE; COLOMBIA; ECUADOR; FRENCH GUIANA; PARAGUAY; PERU; SURINAM; URUGUAY; VENEZUELA.

South Carolina. A south Atlantic state of the United States, eighth of the original 13 to ratify the constitution, South Carolina is known as the "Palmetto" state. Area: 31,055 sq.mi. (750 sq.mi. inland water). Population: (July 1, 1956, est.) 2,353,000; (1950 census) 2,117,027; 61.1% white, 38.9% nonwhite (almost entirely Negro), 63.3% rural. Capital: Columbia, pop. (1950) 86,914. Other chief cities (with 1950 pop.): Charleston, 70,174; Greenville, 58,161; Spartanburg, 36,795; Rock Hill, 24,502; Florence, 22,513; Sumter, 20,185.

History.—Civil rights of Negroes continued to be the dominant political issue in South Carolina in 1956. Various additional laws were enacted designed to maintain segregation in the public schools, notably one requiring the closing of white colleges when

served with a court order to admit students, in which case the state college for Negroes must also cease operation. The legislature closed one state recreational park to forestall a pending suit for admission of Negroes and ordered other parks closed when served with a desegregation court order. While officially commending the activities of prosegregation citizens councils, the legislature prohibited employment of members of the National Association for the Advancement of Colored People by the state or its subdivisions. A so-called "interposition" resolution condemned the desegregation decision of the U.S. supreme court and declared the intention of the state to exercise all reserved powers to protect its "sovereignty." In other fields the legislature prohibited the practice of naturopathy, placed a state lien on property of persons receiving old-age assistance, required merchants selling Japanese textiles to display signs advertising the fact, authorized the highway department to build controlled access express roads and to fix minimum speeds and created a commission to plan for the 1970 tricentennial celebration of the settlement of Carolina. In a special session a 500-ac. limit on alien land ownership was raised to 500,000 ac. to insure location in the state of a Bowater Paper Co. plant.

State elections in 1956 were marked by the small number of contests. U.S. Sen. J. Strom Thurmond, in accordance with a pledge made during his successful 1954 write-in campaign, resigned to seek renomination in the Democratic primary, met no opposition in the primary and general elections and immediately replaced interim appointee Thomas A. Wofford. In the only primary contest for congress, Robert W. Hemphill was nominated for the seat vacated by Rep. James P. Richards. In the general election Republican opposition for congressional offices was absent or inconsequential except in the case of Republican Leon P. Crawford who polled one-fifth as many votes as did Sen. Olin D. Johnson. Chief interest was focused on the presidential election. The Democratic state convention after naming delegates to the national Democratic convention at Chicago, adopted a "wait and see" policy by recessing until two weeks after the national convention. In Chicago the delegation voted against both platform and nominees but the reassembled state convention pledged electors to Adlai E. Stevenson and Sen. Estes Kefauver, thus inspiring an independent movement and the nomination by petition of electors opposed to the civil rights position of both national parties and committed to Sen. Harry Byrd of Virginia and Rep. John Bell Williams of Mississippi. In the election in November about 45% of nearly 300,000 votes were Democratic, 30% Independent, 25% Republican. It was the largest Republican vote in state history and the first time since 1874 that Democrats failed to gain a majority.

Chief state officers in 1956 were: George Bell Timmerman, Jr., governor; Ernest F. Hollings, lieutenant governor; O. Frank Thornton, secretary of state; Jeff B. Bates, treasurer; T. C. Callison, attorney general; Eldridge C. Rhodes, comptroller general; Jesse T. Anderson, superintendent of education; Taylor H. Stukes, chief justice.

Education.—Construction of public schools continued under a 1951 program financed by sales tax. The Educational Finance commission by Oct. 1956 had approved (since the beginning of the program) projects costing \$169,881,764 of which about 53% was for Negro schools. Total expenditures for public schools in the year ended June 30, 1956, were \$134,811,154 of which \$83,523,521 was for current expenses. Of 563,244 pupils enrolled, 214,954 were in white elementary schools, 181,470 in Negro elementary schools, 104,716 in white high schools, 62,104 in Negro high schools. Elementary teachers numbered 6,927 white and 5,033 Negro; high school teachers, 4,472 white and 2,233 Negro. Average teacher's salary was \$2,956.

Social Insurance and Assistance, Public Welfare and Related Programs.—In the year ended June 30, 1956, public expenditures for relief of needy persons amounted to \$25,366,482 of which \$18,535,226 were federal funds. The total of 94,376 persons receiving assistance included 47,914 aged, 2,220 blind, 33,362 dependent children, 9,109 totally disabled and 1,771 needing general assistance. The average weekly number of persons receiving unemployment compensation was 8,943 and the amount paid in benefits during the year was \$9,140,424. On June 30 funds available for unemploy-

ment compensation totalled \$71,510,727. Patients in the state mental hospital, June 30, numbered 6,199; in the school for feeble-minded, 1,764. On the same date there were 1,874 in the state penitentiary, 205 in Negro boys' reformatory, 264 in white boys' reformatory, 83 in Negro girls' reformatory, 97 in white girls' reformatory.

Communications.—Highway mileage in the state system on June 30, 1956, was 25,012 of which 19,001 were paved; mileage of rural roads 26,096, largely unpaved. State highway department receipts for the fiscal year were \$53,584,434 and expenditures \$53,760,820. At the end of 1955 railway mileage was 3,340 and telephones numbered 376,383. Estimated imports tonnage in the calendar year 1955 was 1,342,542; exports, 520,266. The value of imports for the fiscal year ended June 30, 1956, was \$66,500,000; of exports, \$122,200,000.

Banking and Finance.—On June 30, 1956, there were 26 national banks with 61 branches, 113 state banks with 25 branches, 1 military facility, 8 cash depositories. Total resources, deposits and capital were respectively, national, \$547,746,000, \$505,068,000, \$10,436,000; state, \$332,825,365, \$298,764,136, \$12,759,000. Resources of 36 state building and loan associations were \$102,839,494; of 41 federal associations \$291,192,582.

During the year ended June 30, 1956, the state operated under a general appropriations budget of \$171,570,517 and showed a general fund surplus of \$1,987,472 at the end of the year. Total state receipts and expenditures were respectively, \$308,383,280 and \$320,156,115. For the year beginning July 1, 1956, the general appropriations act totalled \$178,329,180. The June 30 funded debt was \$156,027,292 of which \$117,683,000 was for public schools and colleges, and \$36,366,000 for highways. Federal internal revenue collected amounted to \$269,837,864; customs collections, \$6,002,331.

Agriculture.—The October estimate of total 1956 value of field and commercial truck crops was \$285,424,000, about 10% below 1955 when the year-end estimate was \$316,790,000 from 3,746,000 ac. harvested. Cash farm income in 1955 was \$350,559,000 of which about 75% was from crops, 24% from livestock and its products, 1% from government payments.

Table I.—Principal Crops of South Carolina

	Indicated 1956	1955	Average, 1945-54
Corn, bu.	20,685,000	29,344,000	24,567,000
Wheat, bu.	3,984,000	2,812,000	2,849,000
Oats, bu.	17,892,000	14,245,000	14,404,000
Hay, tons	528,000	626,000	499,000
Peanuts, lb.	10,200,000	9,350,000	13,213,000
Soybeans, bu.	2,596,000	2,740,000	710,000
Irish potatoes, cwt.	605,000	585,000	978,000
Sweet potatoes, cwt.	954,000	1,265,000	1,565,000
Tobacco, lb.	289,775,000	326,800,000	264,213,000
Cotton, bales	520,000	570,000	692,000
Pecans, lb.	5,500,000	200,000	3,414,000
Peaches, bu.	4,250,000	*	3,716,000

*Less than 500 bu.

Source: U.S. Department of Agriculture.

Table II.—Value of Principal Industrial Products of South Carolina

Industry	Year ending June 30, 1956	Year ending June 30, 1955
Textiles (including knitting)	\$1,843,143,190	\$1,604,691,784
Lumber products (barrels, boxes, baskets, veneering, paper and pulp, furniture, woodwork)	241,637,384	187,120,267
Clothing	143,703,288	123,761,684
Electricity	99,115,763	88,350,622
Textile supplies	38,466,002	
Foundries and machine shops	35,101,884	33,487,363

Source: South Carolina Department of Labor.

Manufactures.—The value of products manufactured in 2,125 reporting establishments during the year ended June 30, 1956, was \$2,788,636,467, an increase of \$378,471,701 over the previous year. Total manufacturing capital was \$1,270,375,915, an increase of \$42,834,105. Employees numbered 195,358, an increase of 6,359. Wages paid industrial workers totalled \$542,802,035, an increase of \$48,600,536. (C. E. CN.)

Table III.—Mineral Production of South Carolina

		(In short tons)			
Mineral	Quantity	1953 Value	Quantity	1954* Value	
Total		\$17,771,000		\$17,744,000†	
Clays	964,000	4,802,000	1,136,000	4,702,000	
Sand and gravel.	2,976,000	2,564,000	2,814,000	2,550,000	
Stone	2,914,000	3,976,000	2,862,000	4,233,000	
Other minerals. . . . .	...	6,429,000	...	6,375,000	

*Preliminary.

†Total has been adjusted to eliminate duplication in the value of raw materials used in the manufacture of cement.

Source: U.S. Bureau of Mines.

Mineral Production.—Table III shows the tonnage and value of minerals produced in South Carolina in 1953 and 1954 whose value exceeded \$100,000. In 1954, South Carolina was first of the only two states that produced kyanite, a refractory material, and was second in kaolin or china clay output with 17% of the U.S. total of clay. It ranked 42nd in the value of its mineral output, with 0.13% of the U.S. total.

ENCYCLOPEDIA BRITANNICA FILMS.—*Southeastern States*, 2nd ed. (1956).

South Dakota. A north central state of the United States, admitted to the union in 1889. South Dakota is called the "Land of Infinite Variety." Area: 77,047 sq.mi., of which 511 sq.mi. are water. Pop.: (est. July 1, 1956) 696,000;

(1950 census) 652,740, one-third urban, two-thirds rural. In 1950 the state had 23,334 Indians and 727 Negroes. Capital: Pierre, pop. (1950) 5,715. Principal cities: Sioux Falls, 52,696; Rapid City, 25,310; and Aberdeen, 21,051.

History.—Two events in the state attracted national attention during 1956. While congress was considering a controversial gas measure, Sen. Francis Case announced that interested parties had tendered a \$2,500 contribution to his campaign managers in Sioux Falls. A small southeastern community, Elk Point, made the headlines when public buildings developed alarming cracks as a result of the shifting of subsurface sand and mud. The town is located on the flats of the Missouri river.

Two laws passed by the 1955 legislature were the subject of much debate. Although courts upheld the validity of a school measure designed to speed up the reorganization of school districts, strong opposition was still expressed in rural areas. The operation of a new system of tax assessment was attacked in particular by county supervisors, who desired more autonomy at the county level. Both political parties expressed support for the calling of a convention to revise the state constitution, adopted in 1889.

Two federal dams neared completion during the year. Pactola, in the Black hills, was ready to take water in August. When filled, it would supply water for irrigation and for Rapid City and the adjacent air base. Gavins Point dam, on the Missouri, produced commercial power for the first time early in September. Fort Randall dam and reservoir, the first mainstem project to be completed under the Pick-Sloan river control plan, was dedicated July 28. Oahe, the largest of all the dams planned by the army engineers and the bureau of reclamation, was brought to approximately 20% of completion during the year.

Thirty-five of the state's 68 counties were designated emergency drought areas. Starting in July the national guard was used to haul hay from Minnesota. An emergency revolving fund of \$100,000 established by the 1955 legislature was used to assist farmers in hay purchases. A total of 25,173 soil-bank agreements were signed, covering one-fourth of the state's wheat area and 7% of the normal corn area.

Elective state officers of South Dakota in 1956 were: governor, Joe J. Foss; lieutenant governor, Roy Houck; attorney general, Phil Saunders; secretary of state, Geraldine Ostroot Tweet; state treasurer, Ed Elkins; state auditor, F. A. Allbee.

In the November election Republicans once again captured all state house offices; the slate of officials remained unchanged except for a new secretary of state, Mrs. Clara Halls. Pres. Dwight D. Eisenhower carried the state by a wide margin, but by a substantially lower one than in 1952. For the first time since 1938 a Democrat was elected as U.S. representative for South Dakota, while Republican Sen. Francis Case was re-elected in a close race. Democrats were elected to 18 of the 35 state senate positions and 26 of the 75 house positions. The explanation generally given for the marked change in the voting pattern was drought, low farm prices and higher tax assessments.

Education.—There were 271 public high schools maintained in South Dakota in the 1954-55 school year, with 2,028 teachers and 31,393 students. Public elementary enrolment was 100,784 students, with 5,451 teachers. Total expenditures for public education (1954-55) were \$39,134,679. Harold S. Freeman was superintendent of public instruction.

Social Insurance and Assistance, Public Welfare and Related Programs.—The department of public welfare distributed \$5,673,694 in old-age assistance, \$2,724,898 as aid to dependent children, \$418,245 for disabled and \$106,494 for the needs of blind persons during the fiscal year ended June 30. Average payment (June 1956) for 10,273 aged was \$45.05; for 9,257 recipients of aid to dependent children, \$25.08; for 789 disabled, \$46.86; for 198 blind, \$44.91. Unemployment benefits for the fiscal year were \$1,477,718 to a total of 6,216 individuals; there were 1,710 new veteran's claims, total payments to all veterans were \$483,899. The state maintained one prison and one training school; expenditures during the fiscal year amounted to \$926,345. There were 435 inmates at the prison on June 30, 1956.

Communications.—In the year ended June 30, 1956, the state maintained a highway system of 6,707 mi.; county highway systems totalled 20,771

mi., other rural roads, 62,027 mi. Total expenditures for all highway purposes were \$26,112,892, the largest single item in the budget. There were 4,580 mi. of railroad in operation at the end of 1955 and a total of 179,383 telephones.

Banking and Finance.—There were 137 state banks in operation as of June 30, 1956, with resources of \$286,826,035 and total deposits of \$261,228,422; 34 national banks with resources of \$310,470,000 and deposits of \$285,769,000. Eight state building and loan associations reported total assets of \$17,574,478; six federal savings and loan associations had total assets of \$22,480,000.

Total receipts of state agencies for the year ended June 30, 1956, were \$92,331,558; total disbursements, \$93,643,168. The state was free of all bonded indebtedness.

Table I.—Principal Crops of South Dakota

Crop	Indicated 1956	1955	Average, 1945-54
Corn, bu.	105,952,000	87,318,000	106,860,000
Wheat, bu.	17,986,000	27,461,000	42,288,000
Oats, bu.	47,434,000	98,736,000	100,753,000
Barley, bu.	6,360,000	9,198,000	20,745,000
Rye, bu.	1,881,000	4,088,000	4,079,000
Flaxseed, bu.	6,256,000	5,783,000	5,233,000
Soybeans, bu.	3,003,000	2,794,000	971,000
Hay, tons	4,744,000	3,993,000	3,750,000

Source: U.S. Department of Agriculture.

Table II.—Farm Value of Livestock

Livestock	Indicated 1956	1955	Average, 1945-54
All cattle	\$279,461,000	\$306,993,000	\$326,695,000
All hogs	29,133,000	56,187,000	66,827,000
All sheep	19,182,000	21,473,000	19,173,000

Source: State-Federal Crop and Livestock Reporting Service.

Agriculture.—Farm income in 1955 totalled \$534,683,000, including \$5,790,000 in government payments; two-thirds of cash farm income was derived from livestock. At the start of 1956 the index of all farm commodities was at the lowest point since 1946. Crop and meat prices continued below 1955 prices until September. Cattle and calves on feed July 1 were down one-third from 1955, and hog inventories were below average.

Manufactures.—Employees engaged in manufacturing numbered 12,600 in June 1956, with average weekly earnings of \$75.49; employees in non-agricultural establishments totalled 125,600. (Ev. W. S.)

Table III.—Mineral Production of South Dakota

Mineral	1953		1954*	
	Quantity	Value	Quantity	Value
Total.		\$33,892,000		\$37,779,000†
Beryllium concentrate	392	158,000	337	140,000
Clays	331,000	2,826,000	?	?
Feldspar	57,000	321,000	?	?
Gold (oz.)	534,000	18,725,000	541,000	18,951,000
Sand and gravel	5,402,000	2,818,000	19,110,000	7,840,000
Silver (oz.)	139,000	125,000	151,000	137,000
Stone	1,189,000	4,996,000	1,615,000	4,929,000
Other minerals . . . . .	...	3,923,000	...	6,178,000

*Preliminary. †Total has been adjusted to eliminate duplication in the value of clays and stone. ‡Value included with other minerals.

Source: U.S. Bureau of Mines.

Mineral Production.—Table III shows the tonnage and value of those mineral commodities whose value in 1953 and 1954 exceeded \$100,000. In 1954, as in previous years, South Dakota was first among the states in gold output. It also led in output of columbium-tantalite and was third in beryllium; and it was 37th among the states in the value of its mineral output, with 0.27% of the U.S. total.

Southeast Asia Treaty Organization. A regional defense system established by non-Communist members of the UN, this international association is neither as compact as the ANZUS (Australia-New Zealand-U.S.) group which it encompasses, nor as solid as the NATO group (North Atlantic Treaty organization) to which it is a counterpart. Membership in the SEATO organization is not mutually exclusive with membership in the so-called "Bandung group" of Asian-African powers, since the Philippines, Pakistan and Thailand are members of both groups.

During 1956 the SEATO political and military fronts were relatively quiet. The incursions of Chinese Communist forces into border sectors of Burma were naturally of interest to the SEATO powers, but since the Burmese government handled the matter directly with Communist China, no official action was taken. Instead, the SEATO powers developed their staff at Bangkok, conducted several highly successful air, land and sea military exercises and improved their communications and co-ordination for the sake of readiness, should defense be needed. A considerable amount of work, very little of it published for the world public, was also achieved in the field of economic, social

and health programming, but it was not anticipated that the SEATO organization would do more than monitor these activities, leaving the substance to be carried out by existing governments.

In Nov. 1955 U.S. Secretary of State John Foster Dulles proclaimed his interest in preparing a new foreign ministers' meeting which might give greater political content and higher morale to this group of nations.

Established originally by the Manila pact of Sept. 8, 1954, SEATO, as an organization, came into being as a result of the Bangkok conference of Feb. 1955. Three Asian states (Thailand, Pakistan and the Philippines), two Australasian states (Australia and New Zealand) and three powers with Pacific possessions (the U.S., France, Britain) comprised the original group. Membership has neither been lost nor added.

Relative quiet in the far east kept SEATO out of the news during 1956. Cambodia quietly remained connected with SEATO by retaining a connection with France, but the other east Asian nations were in a position to profit by SEATO help if they were attacked, while bearing neither the expense nor commitment of membership while they stayed out.

(See also ARMIES OF THE WORLD.) (P. M. A. L.)

Southern Rhodesia: see RHODESIA AND NYASALAND, FEDERATION OF.

South-West Africa: see SOUTH AFRICA, THE UNION OF; TRUST TERRITORIES.

Sovereigns, Presidents and Rulers: see PRESIDENTS, SOVEREIGNS AND RULERS.

Soviet Union: see UNION OF SOVIET SOCIALIST REPUBLICS.

Soybeans. The U.S. 1956 soybean crop was a record 457,394,000 bu., 23% more than the previous record crop of 1955 and 80% above the 1945-54 average. The 20,953,000 ac. harvested was 12% more than in 1955 and far in excess of the 12,698,000-ac. average for the previous decade. The yield was 21.8 bu. per acre, as compared with 19.9 bu. in 1955 and a 1945-54 average of 20.0 bu. per acre. Once again, Illinois with 135,632,000 bu. (98,325,000 bu. in 1955) was the leading producing state, followed by Indiana (53,214,000 bu.), Minnesota (53,120,000 bu.), Iowa (51,500,000 bu.) and Missouri (41,000,000 bu.). Illinois set a new record of 28.5 bu. per acre.

The 1956 crop price support was \$2.15 per bushel (75% of parity), as compared with \$2.04 per bushel (70% of parity) for the 1955 crop. Prices in 1956, held near the support level early in the year, then rose in spite of the record crop to \$2.98 per bushel to producers in May, after which there was a prolonged decline to support level. Prices on the new crop in the fall of 1956 were slightly above the official support level, in spite of the record crop. The U.S. department of agriculture encouraged farmers to put a sizable part of the record crop under the loan program, announcing that any soybeans delivered to the Commodity Credit corporation in May 1957 would be withheld from the market, at least until the autumn of 1957, except under certain favourable price conditions.

Exports from the 1955 crop were 67,289,000 bu., 7,000,000 bu. more than the previous record, with a further increase anticipated in 1956-57. A program, jointly between the U.S. department of agriculture and the American Soybean association, to improve the soybean export trade with Japan was announced. World production, for the third successive year, was indicated at new record levels, 853,595,000 bu. in 1956, compared with 765,910,000 bu. in 1955, an average for 1945-49 of 551,280,000 bu. and for 1935-39 of 463,720,000 bu. (J. K. R.)

ENCYCLOPEDIA BRITANNICA FILMS.—*Science and Agriculture* (The Soybean), 2nd ed. (1953).

Spain. A country of southwestern Europe, Spain is bounded north by the Bay of Biscay and France, west by the Atlantic ocean and Portugal and south and east by the Mediterranean sea. Area: 194,945 sq.mi., including Balearic (1,936 sq.mi.) and Canary (2,894 sq.mi.) islands. Pop. (1950 census) 27,976,755, including Balearic (422,089) and Canary (793,328) islands; (1956 est.) 28,203,000. Language: mainly Spanish (Castilian) but Catalan, Galician and Basque are also spoken. Religion: Roman Catholic; Protestants, about 25,000. Chief towns (pop., 1950 census, 1953 est. in parentheses): Madrid (cap.) 1,618,435 (1,641,954); Barcelona 1,280,179 (1,288,283); Valencia 509,075 (515,917); Seville 376,627 (383,900); Málaga 276,222 (278,505); Zaragoza 235,444 (267,952); Bilbao 229,334 (238,766); Murcia 218,375 (224,558); 16 towns with a population from 100,000 to 200,000. Chief of state, president of the council of ministers and commander in chief in 1956, Gen. Francisco Franco Bahamonde.

History.—Foreign Relations.—As in 1955, so in 1956, the U.S.-Spanish agreement of Sept. 26, 1953, may be said to have remained the pivot of Spanish foreign policy. Relations between the two countries were uniformly cordial on all levels. A \$3,000,000 scheme was initiated for mutual visits of technicians, a logical outcome both of the increasing interest taken by the United States in Spanish economic development and of the employment of U.S. engineers on the \$350,000,000 construction program of naval and air bases under the agreement, which by the end of 1956 were well on the way to becoming fully operative. Modernizing the equipment of the Spanish armed forces continued. If grants for the fiscal year 1957 be included, Spain's share so far of U.S. financial aid amounted to \$280,000,000, but of this sum \$115,000,000 was allocated to the purchases of U.S. agricultural surpluses. These purchases were paid for in Spanish currency, part of the peseta proceeds of such sales being made available to Spain in the form of long-term loans. A similar procedure was followed in the case of surplus food stuff purchases from the United States made under public law 480.

Spain continued to maintain normal diplomatic relations with all nations of any importance, except the Soviet Union, Communist China and the other peoples' democracies. Diplomatic relations were renewed with Austria, a trade and payments agreement with that country being concluded in February. The United Kingdom remained Spain's best customer, but political relations continued to be affected to a certain extent by the Spanish government's avowed policy of regarding Gibraltar as a *terra irredenta* and by the maintenance of certain restrictions imposed by the Spanish authorities with the object of creating economic difficulties for the rock.

On April 7, the Spanish government formally recognized the independence of Spanish Morocco.

Peaceful relations with the Islamic world were, as before, an important feature of Spanish foreign policy which led Spain to condone Egyptian seizure of the Suez canal, while at the same time advocating the collaboration of user states to assist Egypt in running it as an international waterway.

Internal Affairs.—Though there were no overt signs of what could be construed as serious political unrest, there were indications (disclosed by a fact-finding inquiry carried out late in 1955) that a large cross section of the students of Madrid university were dissatisfied with the authoritarian nature of the regime. This dissatisfaction expressed itself in February in a partial students' strike and in clashes between Falange and anti-Falange student elements, the latter holding that the Falange-controlled University Students union, representatives of which were at that juncture due for election, did not adequately represent the interests of the students as a whole. Fortunately the clashes had no untoward results, but they were taken sufficiently

seriously by the authorities to be officially ascribed to the effect of subversive propaganda. Eight students and former students were tried and sentenced to fines and terms of imprisonment.

These developments resulted in the dismissal of the secretary general of the Falange, Raimundo Fernandez Cuesta, the minister of education, Joaquin Ruiz Jimenez and the rector of the university, Pedro Lain Entralgo. The new secretary general of the Falange, José Luis Arrese, whose appointment was intended to strengthen party influence, made clear party objectives in this context by announcing the eventual introduction of legislation to integrate the Falange more closely with the machinery of government and also to enable the nation to participate "democratically" (though without the formation of political parties) in the "political tasks of the state."

Economic Situation.—Generally speaking employment remained at a satisfactory level, with even signs of over-employment in some industrial areas such as Bilbao. There was, however, a certain amount of unrest over the ever-rising cost of living, resulting in strikes (illegal under the present regime) which took place at Barcelona, Vitoria and Bilbao. The strikes were also in protest against the alleged inadequacy of the officially authorized wage increases. Wages were ultimately raised by an average of from 40% to 50% in commerce and industry as from Nov. 1. As on previous occasions when wage problems were at issue, the Catholic hierarchy came out strongly in favour of the workers, their claims being urged in a pastoral issued by the archbishops in September.

Building activity, both for industry and housing, continued unabated. In an endeavour to keep pace with the rapid growth of the population coupled with the influx of workers from the country into the towns, the government announced a five-year housing plan providing for an annual expenditure of 12,000,000,000 pesetas per annum.

As it had been in 1955, industrial development was well maintained. Further progress was made in the expansion of the national electricity grid and it was generally held that even if droughts recurred, power restrictions were a thing of the past.

Results in the agricultural sector were less satisfactory. Though the wheat harvest was better at 4,200,000 tons as compared with 3,700,000 tons in 1955, there remained some doubt as to whether the necessity for wheat imports would be altogether eliminated. The olive crop for 1955-56 was poor, necessitating the import of edible oil. The most serious setback resulted from the unprecedented February frosts which reduced a record exportable surplus of 1,300,000 tons of citrus fruit to 550,000 tons with a corresponding loss in foreign exchange estimated at about \$100,000,000, not to mention the destruction of trees, which it would take an estimated five years to make good. The United States donated 13,000 tons of foodstuffs for relief in the areas affected.

Miscellaneous.—Spain being an officially Catholic country, relations between church and state were good and called for no special comment. As already stated the church championed the workers in wage claims, and much interest was aroused by a report published in Spain's principal Catholic daily which recounted the experiences of a number of priests who worked voluntarily for a time in various factories at Bilbao and whose conclusions were that the workers there were overworked and underpaid.

The small native Protestant minority, estimated at about 25,000, remained in disfavour with the authorities who maintained their refusal in principle to allow the civil marriage of such Protestants who, though born Catholics, had ceased to practise their religion and desired to make the prior declaration of "non-catholicity" as permitted under the civil code. Other measures taken by the authorities were the closing in January of the only Protestant seminary in Spain (in Madrid) and the confiscation

in April of about 30,000 Bibles and devotional works, the property of the British and Foreign Bible society, though the society's Madrid office was allowed to remain open.

On Nov. 6 Spain withdrew from the Olympic games. The Spanish Sports federation said it was not fitting for Spanish athletes to compete "while the liberty of peoples is being trampled on."

(AL. WA.)

Education.—Schools (1952-53): primary (including private) 65,411, pupils 2,887,090, teachers 80,719; secondary 119, pupils 247,713; vocational, pupils 159,690; teacher training (primary) 106, students 25,421. Universities 12, students 58,143, professors and lecturers (1952) 3,268.

Finance and Banking.—Monetary unit: peseta, with a basic export exchange rate of 21.90, a principal effective export rate of 30.42 and a controlled free rate (principal import rate) of 38.95 pesetas per U.S. dollar. Budget: (1954-55) revenue 26,074,200,000 pesetas, expenditure 26,020,800,000 pesetas; (1955-56 est.) revenue 33,834,046,000 pesetas, expenditure 35,832,671,000 pesetas. Public debt (Dec. 1954): 86,896,700,000 pesetas, of which 4,442,400,000 pesetas was external. Currency circulation: (Sept. 1954) 40,500,000,000 pesetas, (Sept. 1955) 44,800,000,000 pesetas. Deposit money: (Dec. 1954) 64,400,000,000 pesetas, (Dec. 1955) 71,300,000,000 pesetas. Gold reserves: (June 1954) U.S. \$113,000,000, (June 1955) U.S. \$122,000,000.

Foreign Trade.—(1955) Imports 1,918,519,000 pesetas (gold); exports 1,374,953,000 pesetas (gold). Main sources of imports (1955): U.S. and Canada 19%; sterling area 15%; continental E.P.U. (European Payments union countries) 41%. Main destinations of exports: sterling area 20%; Germany 19%; U.S. and Canada 12%; continental E.P.U. 44%. Chief exports: oranges 12%; wine 5%; iron ore 8%.

Transport and Communications.—Roads (1954) 120,763.6 km., of which 73,475.8 km. national roads. Motor vehicles in use (1954): passenger 116,511; commercial 99,404. Railways 17,307 km., of which about 13,090 km. state lines. Rail traffic (state only): passenger-km. (1954) 7,879,000; freight, ton-km. (1955) 7,632,000. Shipping: merchant vessels of 100 gross tons and over (July 1955) 1,225; total tonnage, 1,383,239. Air transport (1955): passenger-km. 403,116,000; freight, ton-km. (1954) 2,292,000. Telephones (Jan. 1955) 996,525. Licensed radio sets (1954) 1,622,000.

Agriculture.—Production (metric tons, 1955; 1954 in parentheses): wheat 3,922,000 (4,798,000); barley 1,729,000 (2,205,000); oats 503,000 (526,000); rye 491,000 (526,000); maize 610,000 (751,000); potatoes 4,300,000 (3,535,000); rice 399,000 (401,000); chick-peas 146,000 (122,000); lentils 28,000 (21,000); broad beans 90,000 (111,000); dry beans 92,000 (96,000); cotton, lint 36,000 (22,000); cottonseed 73,000 (45,000); oranges 1,560,000 (1,305,000); beet sugar, raw 300,000; olive oil 284,000; wool 26,000; wine 16,120,000 hl. Miscellaneous production (metric tons, 1954; 1953 in parentheses): onions 504,000 (556,000); lemons 48,000 (49,000); bananas 214,000 (205,000); tobacco 30,000 (31,700); sweet potatoes and yams 126,000 (148,000); peanuts 12,000 (11,000). Livestock (animals over one year old, Sept. 1954): cattle 4,500,000; sheep 20,000,000; pigs 5,000,000; horses 600,000; mules 1,200,000; asses 800,000; chickens (Sept. 1953) 26,623,000; goats (1950) 4,135,000. Fish landings (1954) 577,600 metric tons.

Industry.—Fuel and power (1955): coal 12,396,000 metric tons; lignite 1,824,000 metric tons; electricity 12,432,000,000 kw.hr.; manufactured gas 316,800,000 cu.m. Production (metric tons, 1955): iron ore (50% metal content) 3,888,000; pig iron 987,600; crude steel (excluding castings) 1,212,000; zinc (smelter) 23,760; copper, blister, 5,760; lead (refined) 61,200; cement 3,756,000; cotton yarn 53,040; wool yarn 15,360; rayon filament yarn 14,280; rayon staple fibre 32,160; potash, K₂O content (1954), 184,000. Ore production (metal content, 1954): lead 55,700; manganese 12,800; antimony 471; tin concentrates 664; tungsten 1,319; pyrites 1,914,000. Index of production (Sept. 1955; 1953=100) 110.

ENCYCLOPEDIA BRITANNICA FILMS.—*Iberian Peninsula* (1948); *People of Spain* (1955); *Spain* (1955).

Spanish-American Literature: see LATIN-AMERICAN LITERATURE.

Spanish Colonial Empire. Under this heading are grouped the Spanish possessions in Africa. Their total area is approximately 134,477 sq.mi. and the total population (1950 census) 1,402,004. Areas, populations, capital towns, and governors of the territories are given in the table.

History.—The year witnessed the end of Spanish rule in that region of northern Morocco of which the protectorate had been assigned to Spain under the Madrid treaty of Nov. 27, 1912. Nationalist agitation in Morocco had culminated in the recognition by France of Morocco as an independent sovereign state. Spain, whose policy it had been to promote the participation in its zone of Moroccan elements in the administration with a view to eventual self-government, had no option but to follow the French lead.

In April the sultan of Morocco, Mohammed V ben Yusuf, paid a state visit to Madrid, and on April 7 an agreement was concluded between the two countries by which the Northern and

Spanish Colonial Empire					
Country	Area (sq.mi.)	Population (1950 census)	Capital	Status	Governor
Spanish Morocco					
Northern zone	7,589	1,010,117 (incl. 84,716 Spanish)	Tetuán pop. (1950 census) 80,732	Protectorate	High commissioner: Lieut. Gen. Rafael García Valiño y Marcén Khalifa (viceroys): Muley Hassan Hassan ben el-Mehdi
Southern zone	12,693	5,878	Cabo Juby	Protectorate	
Ceuta, Melilla, Alhucemas, Chafarinas and Peñón de Vélez	82	141,302	—	Administered as part of Spain	
Spanish West Africa					
Ifni territory	579	38,295	Sidi Ifni	Colony	—
Rio de Oro	71,043	1,304	Villa Cisneros pop. (1950 census) 1,011	Colony	—
Saguia el Hamra	31,660	6,445	—	—	—
Spanish Guinea including Fernando Po and four small islands	10,831	198,663	Santa Isabel, on Fernando Po pop. (1950 census) 11,098	Colony	—

Southern zones of Spanish Morocco were formally incorporated in the new Moroccan state. Spain was to maintain military forces there during the transitional period of the transfer of powers from the Spanish to the Moroccan administration and to render assistance in matters of foreign affairs and defense. In return Morocco undertook to guarantee the rights and liberties of all Spaniards residing in the zone, including those in state employment. Alhucemas, Chafarinas, Peñón de Vélez and the ports of Melilla and Ceuta, though located on the coast of the zone, having long been Spanish territory and administratively part of metropolitan Spain, were not included in the transfer arrangements. To settle these details negotiations between Spanish and Moroccan representatives began in May.

Among the specific problems to be dealt with were the Spanish assets in the zone (tentatively estimated at between 7,000,000,000 and 10,000,000,000 pesetas) and that of the future of the Rif iron mines. Little information became available as to conditions in the zone after the initial stages of the transfer, but there were definite indications that, as the year wore on, public order had seriously deteriorated. There were also signs of tension in Spanish-Moroccan relations. In October the Spanish ambassador in Rabat addressed a protest to the Moroccan government pertaining to an incident involving the Spanish military authorities and the Moroccan governor of Larache. The protest was also against a speech delivered by Abdeljalek Torrès, former leader of the Spanish-sponsored Reformist party in the Spanish zone who was subsequently appointed Moroccan ambassador to Spain. The speech in which he made references to Morocco's achievement of independence and "victory over imperialism" was considered offensive to Spain.

The central government's expenditure on Spanish possessions in Africa for 1956 was budgeted at 1,202,490,000 pesetas, an increase of 102,890,000 pesetas over 1955. (AL. WA.)

Finance.—Spanish Morocco, budget (1954 est.): balanced at 470,200,000 pesetas, of which receipts from zone 220,200,000 pesetas. Spanish Guinea, budget (1953): balanced at 73,936,000 pesetas. Expenditure of central government on African territories (1955 est.) 1,099,600,000 pesetas.

Foreign Trade.—Spanish Morocco (1954): imports 915,800,000 pesetas; exports 622,200,000 pesetas. Spanish Guinea (1953): exports 617,303,300 pesetas (of which 513,932,400 pesetas to Spain); imports 317,315,300 pesetas (of which 282,159,200 pesetas from Spain). Spanish West Africa (1952): exports 38,702,750 pesetas; imports 34,041,980 pesetas.

Transport and Communications.—Spanish Morocco: roads (1954) 2,453 km.; railways (1951) 173 km. Motor vehicles (1954): 3,736. Telephones (Jan. 1955): Spanish Morocco 8,533; Spanish Guinea 604; Spanish North and West Africa 4,480.

Spanish Literature. Translations and discussions with foreigners at congresses effected little change during 1956 in the Spaniard's concentration on his national setting. Within this setting, powerful shibboleths increased the broad obscurity of social, moral and religious subjects and liberated expression in the novel, which was generally limited to the description of the lower forms of society to which national standards of conduct or responsibility do not apply. This fiction portrayed life which was individual, dramatic, often coarse-grained and brutal, selfish and suspended wholly in con-

temporary time. Any resemblances to conditions or persons which could be a subject of reform or revolt were purely coincidental. The essential immobility of this fiction was masked by multiple sound and colour effects, brilliantly "popular" dialogue, impressionistic though detailed delineation and evocation of "place," and a restless episodic succession of inci-

dents and persons, presented rather truculently.

Abundant short stories, many of high quality, occasionally achieved greater intensity. Comic writing and books for children were popular and more numerous than hitherto. Vicente Aleixandre again (Academy lecture, January) emphasized the triple preoccupation of contemporary poets with their own times, with the anguish and hopes of religion and with their country. There were signs in religious verse of a simple, more virile and personal expression, which, in unexceptional forms, included a few notes of hope and of gratitude for friendship, memories and natural settings, among many more of unforced despair and isolation. The sense of communication with *patria* and *paisanos* had obviously deepened, though the future was still unseen.

Two centenaries were widely celebrated, those of St. Ignatius of Loyola and of Marcelino Menéndez y Pelayo. In October it was announced that Juan Ramón Jiménez (*q.v.*) had been awarded the 1956 Nobel prize for literature. Two prominent literary journals, *Índice de Artes y Letras* and *Insula*, were suppressed. An informative survey of the work of 1955 appeared in Sainz de Robles' *Panorama Literario* (1955). Notable works published included (1956 unless otherwise stated):

Poetry.—J. de Bengoechea, *Hombre en forma de elegía* (winner of the Premio Adonais, 1955); C. Riba, *Obra poética* (with Castilian versions); R. Montesinos, *País de la esperanza* (1955); R. Millán (ed.), *Antología de poesía española 1954-55* (1955); Gerardo Diego, *Amazona* (1955); J. García Nieto, *La Red*; R. Santos Torroella, *El hombre antiguo*.

Prose Fiction.—C. J. Cela, *Judíos, moros y cristianos*; J. A. de Zunzunegui, *El hijo hecho a contrata*; A. Prieto, *Tres pisadas de hombre* (winner of the Premio Planeta, 1955); R. Sánchez Ferlosio, *El Jarama* (winner of the Premio Nadal, 1955); M. Delibes, *Diario de un cazador*; M. Halcón, *Los Dueñas*.

Essay.—P. Lain Entralgo, *España como problema*.

Scholarship.—G. Torrente Ballester, *Panorama de la literatura española contemporánea*; M. Fernández Almagro, *Historia política de la España contemporánea*; P. J. Juambelz, *Bibliografía sobre S. Ignacio de Loyola 1700-1950*. (R. F. B.)

Speed Records: see AIR RACES AND RECORDS; AUTOMOBILE RACING; AVIATION, MILITARY; HORSE RACING; MOTOR-BOAT RACING; TRACK AND FIELD SPORTS; YACHTING.

Spices. United States consumption of and trade in spices in 1956 appeared to be more nearly stabilized than in any year since World War II. For most major types, supplies were fully equal to demand, and prices eased. Spices, classed as complementary imports, amounted to 79,330,000 lb. valued at \$30,174,000 in 1955-56; imports for the previous year were 84,352,000 lb. valued at \$34,830,000.

Total available world supplies of pepper in 1956 were estimated at 68,152 tons including carry-over stocks, as compared with 61,393 tons in the previous year. The Indian 1955-56 crop was 24,000 tons as compared with 19,000 tons in 1954-55. The

Lamong, Indon., crop increased to 6,500 tons from 5,000 tons in 1955. World consumption of pepper in 1955 was about 46,365 tons against 50,776 tons in 1954, but U.S. consumption increased to 15,500 tons, from 14,000 tons in 1954. U.S. imports were 14,550 tons of black pepper and 1,225 tons of white pepper in 1955, a total of 15,775 tons against 16,937 tons in 1954. India, having abolished the export duty late in 1955, supplied about one-half, with the remainder rather evenly divided between Sarawak and Lampong, with small amounts from Ceylon. Prices drifted lower, to a level of about 10% as high as the post-World War II peak, when something near \$3.00 per pound was obtained.

A pepper futures market was activated in Rotterdam and Amsterdam, Neth., after a 16-yr. suspension. An Indian commission recommended that a futures market for pepper should be established at Cochin (India). The government of India sponsored a Pepper Export Promotion council, which included within its scope production, crop estimation, export promotion, trade terms and standardization of quality. Simpler methods of propagating the pepper plant appeared to be successful and aided in the establishment of plantings in Puerto Rico.

The price of vanilla beans continued to decline during the early part of 1956 but reacted violently to the report of hurricane damage in Madagascar. Vanillin declined about 7% in price under competitive pressure.

The nutmeg industry in Grenada, Wind. Is., severely damaged by a hurricane in Sept. 1955, was reported as needing a long period of recuperation.

The more important flavouring essential oils presented no major shortages nor any major price changes during 1956. Those of the citrus group were generally abundant and declined somewhat in price. Oil of lemongrass strengthened in price. The mint oil group presented diverse trends. Peppermint was well below the previous year in price, whereas spearmint advanced. Indicated domestic production was 2,230,000 lb. of peppermint oil and 757,000 lb. of spearmint oil, as compared with 1,945,000 lb. and 593,000 lb. respectively in 1955. Increased quantities of anise oil were available at rather high prices. Cassia oil continued scarce and clove oil eased in price. (J. K. R.)

Spirits: see LIQUORS, ALCOHOLIC.

Spitsbergen: see NORWAY.

Sports and Games: see ANGLING; ARCHERY; AUTOMOBILE RACING; BADMINTON; BASEBALL; BASKETBALL; BILLIARDS; BOBSLEDDING; BOWLING; BOXING; CHESS; CONTRACT BRIDGE; CURLING; CYCLING; FENCING; FOOTBALL; GLIDING; GOLF; GYMNASTICS; HANDBALL; HOCKEY, FIELD; HOCKEY, ICE; HORSE RACING; ICE SKATING; LACROSSE; LAWN BOWLING; MOTOR-BOAT RACING; OLYMPIC GAMES; POLO; ROWING; SHOOTING; SKIING; SOCCER; SOFTBALL; SQUASH RACQUETS; SWIMMING; TABLE TENNIS; TENNIS; TRACK AND FIELD SPORTS; WRESTLING; YACHTING.

Squash Racquets. G. Diehl Mateer, Jr., of Philadelphia, Pa., regained the United States squash racquets singles championship at the Hartford (Conn.) Golf club on Feb. 13, 1956, when he defeated the defending titleholder, Henri Salaun of Boston, Mass., 15-9, 15-10, 15-10, in the final round of the 1956 tournament. The New York city team swept to its second straight intercity team title, winning all three of its matches by 5-0. Carl Badger and James Ethridge, III, of the Field club of Greenwich, Conn., triumphed in the national doubles competition conducted at the Racquet and Tennis club in New York city in March. Badger and Ethridge subdued Richard Remsen of the University club in New York city and John Russell, III, of the Sea Bright Squash Racquets club, 15-7, 17-15, 15-13, in the title round.

Mateer added to his stature as the leading U.S. amateur by annexing the Harry Cowles invitation tourney. In the final of the tenth annual event at the Harvard club in New York city, Mateer defeated Calvin MacCracken of the Englewood (N.J.) Field club, 15-11, 15-8, 18-16.

Al Chassard of the Saucon Valley club of Bethlehem, Pa., won national professional honours by defeating Al Molloy of the Buffalo (N.Y.) Squash and Tennis club at the New York Athletic club on Jan. 22. The score of the bitterly fought final was 10-15, 15-0, 10-15, 15-13, 15-13, 15-13, 15-13. The 1955 title winner, Hashim Khan of Pakistan, did not defend his championship. Badger and Ethridge regained the Lockett cup when they conquered Russell and Remsen in the final of the annual doubles tourney at the University club. The score was 15-18, 15-10, 15-11, 15-12.

Mrs. Pepper Constable of Princeton, N.J., won the United States women's singles laurels in a five-game final with Mrs. Charles Wetzel of Philadelphia. The score was 10-15, 11-15, 17-16, 15-8, 15-10. The team of Mrs. John Carrott, Greenwich and Hilda Smith-Peterson, Boston, defeated Mrs. Garth Kauffman, Greenwich, and Mrs. J. Newton Hunsberger, Philadelphia, 15-10, 15-11, 18-16, in the invitation doubles final.

Ben Heckscher, Harvard, won national intercollegiate laurels by halting Juan Hermosilla, Massachusetts Institute of Technology, 18-13, 15-9, 15-10. Harvard, unbeaten in ten dual matches for the season, was team champion with 14 points, Navy being next with 13. Steve T. Vehslage of Haverford Prep, Philadelphia, won both national junior and interscholastic honours.

The U.S. beat Canada, 11-4, in the annual international competition for the Lapham trophy at the Agawam Hunt club, East Providence, R.I. In England, Hashim Khan set a record by winning the British open crown for the sixth consecutive year when he defeated a cousin, Roshan Khan, 9-4, 9-2, 5-9, 9-5. Roshan Khan took the Canadian open by downing Mateer, 9-15, 15-8, 18-15, 15-3. (T. V. H.)

Stamp Collecting: see PHILATELY.

Stars: see ASTRONOMY.

State, U.S. Department of: see GOVERNMENT DEPARTMENTS AND BUREAUS, U.S.

State Fairs: see FAIRS AND EXHIBITIONS; SHOWS.

State Guard: see NATIONAL GUARD.

Steel: see IRON AND STEEL.

Stellar System: see ASTRONOMY.

Stereophotography: see PHOTOGRAPHY.

Stevenson, Adlai Ewing (1900-), U.S. political figure, was born at Los Angeles, Calif., on Feb. 5. He was graduated from Princeton university in 1922, subsequently earning his law degree at Harvard and Northwestern (Evanston, Ill.) universities. After serving abroad as a newspaper correspondent, he became a federal official, principally with the agriculture, state and navy departments. He was governor of Illinois from 1949 to 1953, and was the Democratic nominee for president in 1952. Carrying only nine states, he was defeated on Nov. 4 by Dwight D. Eisenhower.

Despite his 1952 defeat, Stevenson was renominated for the presidency in 1956. He conducted a more energetic campaign than in 1952, travelling more extensively and adopting a less lofty oratorical style. He offered the voters a social and economic program for what he called a "New America," which consisted largely of an expansion of the Franklin D. Roosevelt-Harry S. Truman reforms. On the domestic side, he assailed the Eisenhower administration as too favourable to "big business" and forgetful of the "little people."

Stevenson criticized especially the administration's conduct



ADLAI E. STEVENSON smiling in front of an equally jubilant campaign poster when announcing at a press conference that his chief opponent for the Democratic party presidential nomination, Estes Kefauver, had withdrawn and had urged his supporters to switch to Stevenson

of foreign affairs, charging that Eisenhower had not shown courageous leadership in this field and that the president's policies had cost the U.S. prestige and friends throughout the world. He called for an end to the draft and to hydrogen-bomb tests, provided that their termination did not jeopardize national security.

But foreign developments in the last few weeks of the campaign operated against him. The Soviet premier, N. A. Bulganin, endorsed Stevenson's plan for terminating hydrogen-bomb tests, and the brutal Soviet suppression of the revolts in Poland and Hungary, as well as the Anglo-French-Israeli invasion of Egypt, stirred thoughts and fears of a World War III. U.S. voters apparently felt that the troublous times required in the White House a more experienced man than Stevenson, and especially a military leader. Stevenson himself blamed the extent of his loss on the "foreign crisis."

On Nov. 6 Stevenson carried only seven southern and border states for an electoral total of 73, or 16 less than in 1952, against Eisenhower's 457. Six southern and border states fell into the Republican column. Moreover, many large cities, which had been historic Democratic strongholds because of labour, liberal and racial support, voted for Eisenhower, while contributing to the election of a Democratic congress.

Although Stevenson's post-election statement said that he would maintain his interest and faith in the Democratic

party, politicians believed that his two unsuccessful attempts had eliminated him as a future presidential candidate.

(See also ELECTIONS, U.S.; POLITICAL PARTIES, U.S.)

(R. Tu.)

Stocks and Bonds. U.S. Stocks.—The 1956 bull market was characterized by a much higher degree of uncertainty about the future course of stock prices than at any time since 1953. Based in large degree upon monetary factors, particularly in the second half of the year, there was a growing bearishness on the part of investment analysts and the public. A strong sentiment developed about midyear that the market had reached the end of its record three-year climb. Measured by Standard and Poor's composite index of 90 stocks, as shown in Table I, U.S. common stock prices rose to a peak in April at a level 27% above the corresponding month in 1955. During May and June the composite index fell off, but the highest level in many years was achieved in July 1956. Toward the end of the summer, however, the market declined uncertainly with relatively little response to the presidential election of November. At the July peak the industrial average had attained a level of 520.7 which represented a gain of 11.4% over the January level. While railroads registered a gain of 4.5%, the public utilities group of stocks climbed to its highest point in Aug. 1956, almost 6% above the level at the beginning of the year.

The average yield on common stocks fluctuated within a narrow range about 4% during the greater part of 1956. While a small spread remained between stock and bond yields, investors in the autumn of 1956 were able to obtain better yields on many high-grade corporate bonds than they could from securities in the industrial averages. By way of highlighting the relatively low yield basis to which stocks had fallen it was noteworthy that at one point during October 91-day treasury bills drew an interest rate of 3.024%, the highest short-term borrowing cost since banks were closed during the "holiday" of March 1933.

The total number of shares traded on all registered exchanges in the U.S. as reported by the Securities and Exchange commission was 625,221,000 during the first six months of 1956. This represented a decline of almost 15% from the aggregate trading volume established during the first half of 1955. Expressed in terms of market values, the trading in the first half of 1956 amounted to \$18,601,000,000, a decrease of approximately 9% as compared with the \$20,415,000,000 worth of shares sold during the last six months of 1955.

The slackening in trading volume on the New York Stock exchange which prevailed during 1956 was not as pronounced as the decline in the aggregate for all registered exchanges. While average monthly sales were down about ½% from the 1955 pace, the 68,400,000 figure remained near the highest level in several decades.

U.S. Bonds.—United States government long-term bond prices, according to Table II, underwent a substantial decline from the levels which prevailed during 1954 and early 1955. Dur-

Table I.—U.S. Stock Market Prices

Month	Railroads (20 stocks)		Industrials (50 stocks)		Public Utilities (20 stocks)		Stocks (90 stocks)		Yield (90 stocks)	
	1955	1956	1955	1956	1955	1956	1955	1956	1955	1956
Jan.	90.9	101.2	366.5	467.1	124.0	130.8	282.7	350.6	4.38	4.24
Feb.	94.4	101.5	379.1	469.5	127.3	133.0	292.2	352.8	4.32	4.24
March	96.8	107.7	375.1	504.0	127.4	137.7	289.9	377.1	4.33	3.97
April	102.3	110.4	388.9	511.8	128.9	134.8	299.9	381.6	4.19	3.94
May	102.3	109.5	387.3	494.6	128.0	131.9	298.6	369.1	4.23	4.09
June	105.3	104.6	412.9	491.9	129.6	132.4	315.9	367.4	4.01	4.09
July	104.2	105.8	447.7	520.7	132.6	136.9	339.0	387.3	3.77	3.89
Aug.	101.5	103.0	443.9	517.0	135.0	138.5	336.9	385.1	3.87	3.92
Sept.	104.2	97.7	467.0	499.6	134.9	133.9	352.1	371.9	3.72	4.07
Oct.	97.6	.....	443.5	.....	128.8	.....	334.4	.....	3.94	.....
Nov.	103.4	.....	476.0	.....	132.0	.....	356.9	.....	4.05	.....
Dec.	105.2	.....	480.7	.....	132.3	.....	360.3	.....	4.15	.....

Source: Standard and Poor's Trade and Securities Statistics, Current Statistics. Figures are an average for the month, based upon closing prices with 1926 used as base period.

Table II.—U.S. Government Long-Term Bond Prices and Yields

(Average price in dollars per \$100 bond)

Month	Average 1955	Average 1956	Yield 1955	Yield 1956	Month	Average 1955	Average 1956	Yield 1955	Yield 1956
Jan. . .	104.4	101.6	2.65	2.87	July . . .	101.6	100.4	2.87	2.97
Feb. . .	103.6	102.3	2.71	2.81	Aug. . .	101.0	98.2	2.91	3.15
March . .	103.7	101.3	2.70	2.90	Sept. . .	101.5	97.6	2.88	3.21
April . .	102.8	99.4	2.77	3.05	Oct. . .	102.2	.....	2.82	.....
May . .	103.0	100.7	2.76	2.94	Nov. . .	101.9	.....	2.84	.....
June . .	102.8	101.3	2.77	2.90	Dec. . .	101.4	.....	2.89	.....

Source: Standard and Poor's Trade and Securities Statistics, Current Statistics.

Table III.—U.S. Corporate Bond Prices and Yields

(Composite bonds A1+; average price in dollars per \$100 bond)

Month	Average 1955	Average 1956	Yield 1955	Yield 1956	Month	Average 1955	Average 1956	Yield 1955	Yield 1956
Jan. . .	116.7	113.3	2.896	3.104	July . .	114.3	110.2	3.039	3.297
Feb. . .	115.7	113.9	2.954	3.066	Aug. . .	113.3	108.4	3.105	3.418
March . .	115.4	113.2	2.975	3.112	Sept. . .	113.1	105.8	3.118	3.592
April . .	115.2	111.2	2.983	3.234	Oct. . .	113.5	.....	3.089	.....
May . .	114.7	110.6	3.018	3.274	Nov. . .	113.7	.....	3.079	.....
June . .	114.5	110.5	3.030	3.279	Dec. . .	112.4	.....	3.161	.....

Source: Standard and Poor's Trade and Securities Statistics, Current Statistics.

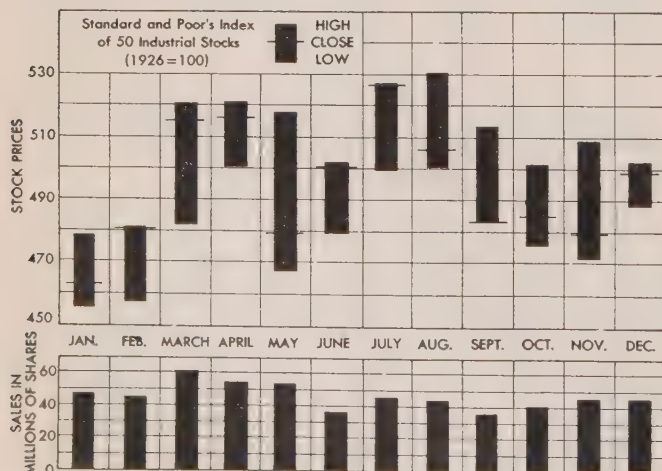
ing the first nine months of 1956 the average long-term bond price was 100.3 as contrasted with 102.7 for the corresponding period in 1955 and 106.1 for 1954. By Sept. 1956 the price of long-term government bonds had dropped to 97.6, the lowest point in several years. Corporate bonds with A1+ ratings, as shown in Table III, responded to the credit tightening phase of federal reserve board policy in the same manner as did government securities. The average price for the first three quarters of 1956 was 110.7, as compared with 114.7 in 1955 and 117.1 in 1954.

Bond yields, as indicated in Tables II and III, rose substantially during the first nine months of 1956 in line with the trend toward higher interest rates throughout the economy. The levels attained in Sept. 1956 of 3.592 for high-grade corporates and 3.21 for long-term government issues were the highest since 1953.

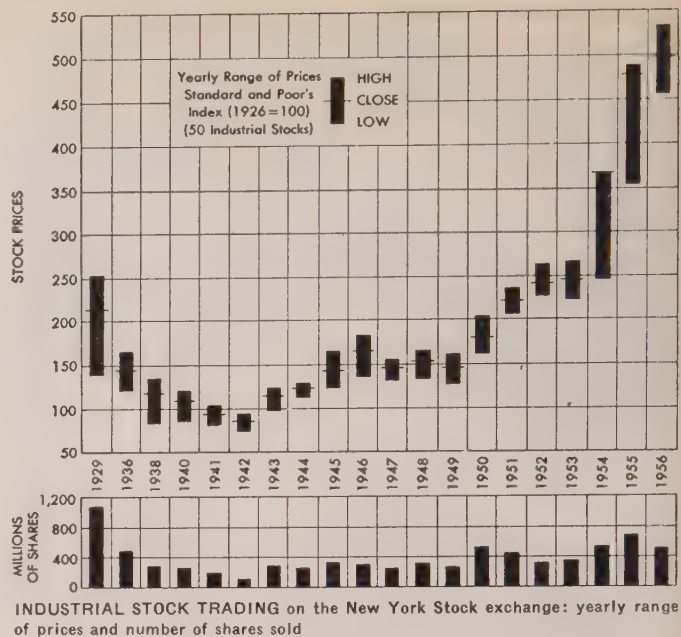
The market value of bond sales, exclusive of United States government bonds, on all registered exchanges in the United States during the first half of 1956 amounted to \$631,365,000. While this figure represented a substantial increase over the \$567,256,000 sales volume for the corresponding period in 1955, it was slightly less than the amount sold during the last six months of 1955.

According to the U.S. department of commerce, the market value of all bond issues listed on the New York Stock exchange at the end of June 1956 was \$104,289,000,000, which was almost identical with the \$104,282,000,000 value reported a year earlier. Domestic issues accounted for more than 99% of the total.

Market Conditions.—The most significant set of developments affecting the market in 1956 related to changes in the level of interest rates. During April and August, the board of governors of the federal reserve system approved increases to 3% in order



SALES AND PRICES on the New York Stock exchange, 1956



to bring rediscount rates into line with open market rates. The prime rate of commercial banks rose above 4% during Sept. 1956. Brokers were charging 5½% and more on debit balances, a rate substantially higher than the average stock yield, so that in-comewise it had become unprofitable to carry stock on margin. In the face of a strong demand for funds by all classes of borrowers and a rise in the cost-of-living index, the restraints on credit imposed by the federal reserve board pushed interest rates upward with a moderately depressive effect on bond prices and current stock yields.

Corporate profits during 1956 failed to sustain the year-by-year gains which had characterized corporate earnings since 1952, but the dividend pattern was such that the year's payment rate was the greatest in history. Corporations listed on the New York Stock exchange boosted their cash dividends during the first three quarters of the year by more than 17% above the corresponding 1955 period. Of the 1,079 common stocks listed in Sept. 1956, 961, or 89%, paid one or more cash dividends in the first nine months. Increased payments were made by 573 of the common stocks with 321 paying the same amount in both periods and 67 paying less in 1956 than in 1955.

New York Stock Exchange.—Investment clubs, a new phenomenon in the market, showed an enormous rate of growth in 1956. Before 1951 there were fewer than 400 investment clubs in existence. By the end of 1956 the National Association of Investment Clubs estimated that there were more than 10,000 groups of investors banded together for the purpose of systematically investing small sums of money in carefully selected securities, in accordance with the requirements of the "dollar-averaging" principle. A New York Stock exchange study of trading on June 8 and 15, 1956, showed that investment clubs accounted for 92,000 shares or 5.6% of the total volume.

The Monthly Investment plan, which was inaugurated in Jan. 1954 by members of the New York Stock exchange to give more people a way to invest out of income on a pay-as-you-go basis, showed continuing growth during 1956. More than 50,000 such plans were in effect by the end of the year, and it was noteworthy that investors tended to be conservative in their selection of securities, with more than 80% of the plans providing for automatic reinvestment of dividends.

The New York Stock exchange midyear report showed an increase in gross income from the 1955 level of \$7,935,333 to \$8,478,133, but net income declined by about \$100,000 under the



HENRY FORD AND KEITH FUNSTON, president of the New York Stock exchange, standing on the littered floor of the trading area after Ford Motor company stocks were placed on the market for the first time in 1956

preceding year. Lower trading volume in the first six months resulted in lessened income from direct charges to members and member firms. Listing fees, however, showed a gain during the six months. This reflected the new listing of 11 companies, including the Ford Motor Co., and approval of 354 applications for listing of additional shares, including the mammoth three-for-one stock split of Standard Oil Company of New Jersey.

Expenses rose as the exchange increased wages and salaries and added new employees. Advertising expenses during the first six months rose \$247,244 as the exchange stepped up its program to promote wider stock ownership throughout the country.

(See also SECURITIES AND EXCHANGE COMMISSION.) (I. Pr.)

Stomach and Intestines, Diseases of the.

Oesophagus.—Prolonged contact of the lining of the oesophagus with acid from the stomach or alkaline contents from the intestine caused inflammation of the oesophagus (oesophagitis). The most important factor was repeated vomiting, as in persons with oesophageal hernia or intestinal obstruction, during pregnancy and after operations. Symptoms included a burning sensation or pain in the upper abdomen and beneath the breastbone and gaseous distress relieved by belching; difficulty in swallowing resulted from spasm or scar tissue narrowing of the oesophagus. Treatment included medicines to reduce the acid and to counteract the inflammation, elevating the head of the bed to decrease the regurgitation of irritating fluid, and mechanical stretching of narrowed areas of the oesophagus. Prevention was most important; correcting the causes of vomiting and avoiding unneces-

sary operations on the lower part of the oesophagus or the upper portion of the stomach.

Difficulty in swallowing (dysphagia) necessitated careful examination of the throat and larynx, direct inspection of the oesophagus and special X-ray techniques to determine the cause. In addition to inflammatory and motility disorders, dysphagia resulted also from emotional disturbances, causing pronounced spasm of the muscle layers of the oesophagus.

Stomach.—The importance of hydrochloric acid in the stomach as a vital factor in the development of peptic ulcer is no longer questioned. While the high acidity in duodenal ulcer has been considered nervous in origin, acid production in stomach (gastric) ulcer was attributed to a hormone. Prolonged, excessive stimulation of the lower end of the stomach (antrum), as in patients with narrowing of the stomach outlet, liberated increased quantities of gastrin. Removal of the antrum experimentally reduced the amount of acid. The operation of vagotomy and hemigastrectomy for peptic ulcer was based upon this concept. Other endocrine influences, including the adrenal glands, also have been implicated in the excessive secretion of hydrochloric acid in duodenal ulcer. There appeared to be a higher incidence of blood group O in patients with duodenal ulcer, whereas in gastric ulcer the distribution of blood groups was normal. The incidence of ulcer was increased in patients with diminished ventilation of the lungs and retention of carbon dioxide in the blood (pulmonary emphysema). These intriguing observations stimulated further interest in the factors predisposing to peptic ulcer.

The objectives of ulcer therapy—relief of pain, healing of the active ulcer and prevention of recurrences and complications—necessitated a carefully supervised medical program, emphasizing adequate diet, efficient control of stomach acidity and the identification and management of physical and nervous stresses; co-operation of the patient was important. Newer drugs to lessen stomach acidity excelled earlier preparations, but the effective dose varied greatly and often was much higher than original estimates indicated. These medicines appeared to be most useful when administered for long periods in adequate amounts as determined for each individual. Several new compounds lowered acidity for long periods, suggesting their use in controlling acid production during the night, when the ulcer program could not be maintained. The hazard of haemorrhage from ulcer increased with age, but a previous haemorrhage did not necessarily intensify the risk; the excessive use of salicylates not infrequently precipitated bleeding. In treatment of this complication, co-operative care by a "keen physician and somewhat reluctant surgeon" was most important. Medical management, including adequate replacement of blood, was effective in most instances. For patients requiring surgery, various procedures were available, including direct operative closure of the bleeding area. The undesirable consequences of extensive gastric surgery remained a major concern. Problems, in addition to the "dumping" syndrome, included poor nutrition and obstruction of the intestinal loop joined to the stomach. However, surgery remained highly effective in those persons requiring operation.

Statistical evidence re-emphasized the increasing incidence of stomach cancer with advancing age and the greater susceptibility of males than females. Diagnosis remained a challenging problem because of the long asymptomatic interval. Examination of "susceptible" persons, careful appraisal of all gastric ulcers, and improved techniques, including gastric biopsy and the study of cells from stomach washes (cytology), were the most useful methods of diagnosis. Cytology also was helpful in the recognition of other tumours of the stomach and intestine (lymphomas), for which more effective therapeutic methods were available.

Intestines.—Defective absorption of fat and other nutrient

materials from the small bowel resulted in excessive loss of fat from the body, diarrhoea with large, greasy bowel movements (steatorrhoea), abdominal distress, severe weight loss and various biochemical disturbances. The numerous causes of this disorder included inflammation of the small intestine, rapid passage of food through the bowel following stomach operations, pancreatic deficiency, a possible bowel infection and unusual sensitivity to the gluten in wheat, as postulated for the disease sprue. Treatment included decreased fat intake, elimination of gluten from the diet, sulfa drugs and antibiotics, occasionally pancreatic extract, and the administration of iron, calcium, vitamins and folic acid to correct nutritional deficiencies. Corticotrophin, cortisone or prednisone often improved intestinal absorption and, together with a gluten-free diet, facilitated better control of this disorder. Intestinal infections with *Salmonella* bacteria, often resistant to sulfonamides and antibiotics, responded to large amounts of crystalline penicillin injected intravenously; but this treatment did not eliminate the carrier state in children.

In addition to the excessive use of laxatives and dietary irritants, nervous tension was an important cause of the irritable colon, producing spasm and irritability of the large bowel. The principal symptoms were abdominal discomfort, flatulence and constipation or diarrhoea. The term "irritable colon" was preferable to "colitis," for there was no inflammation or ulceration. Treatment included the avoidance of irritating foods, adequate rest, relief of tension and intelligent management of the emotional difficulties present.

Ulcerative colitis, characterized by severe inflammation and ulceration of the large bowel and by numerous complications, continued to present a more serious problem. Despite extensive study in many countries, the cause remained obscure and treatment consequently difficult. In some cases, fat absorption was reduced; in a few patients, anaemia developed as a result of immunological processes destroying blood cells. In pregnant colitis patients the first trimester was the most trying period; the illness was less troublesome later in pregnancy. Interest in the operative treatment of ulcerative colitis increased as the response to medical treatment was not sustained and as surgical techniques improved. However, the procedure of total colectomy and ileostomy not infrequently was followed by complications such as obstruction, prolapse, haemorrhage and skin irritation.

Diverticula, small pouches projecting from the bowel wall, are common and usually do not cause symptoms. Inflammation of these diverticula produced diverticulitis involving especially the left (descending) colon. In the acute stage, treatment with limited intake of food, fluids intravenously and antibiotics was highly successful. In occasional patients not responding to such management, an opening in the bowel (colostomy) was necessary. In patients with recurrent bouts of acute diverticulitis despite medical treatment, the diseased segment of colon could be removed surgically and normal bowel continuity restored, eliminating the cause.

Liver.—Chlorpromazine, a nonbarbiturate compound, prescribed in the treatment of emotional disturbances and in certain instances of nausea and vomiting, produced a characteristic type of liver injury, attributed to hypersensitivity; the incidence was 1% or less, depending upon the dosage. The illness resembled obstruction of the larger bile ducts; jaundice usually appeared during the second or third week of treatment and cleared after several weeks. ACTH and cortisone reportedly were helpful in some cases.

An unusual outbreak of hepatitis in Sweden was attributed to the eating of infected oysters; the incubation period ranged from 21 to 32 days. The clinical course suggested influenza, but some patients developed severe abdominal pain suggestive of a surgical disease.

There was further evidence of the direct injurious action of alcohol upon the liver. Excessive alcohol, malnutrition and hepatitis caused fatty changes, inflammation, scarring and anatomic distortion of the liver (cirrhosis).

In severe liver disease ammonia metabolism was abnormal, and excessive amounts of protein foods and nitrogen-containing medicines occasionally resulted in coma and large increases in blood ammonia. The disturbance was related in part to bacterial action within the colon; treatment with certain antibiotics and sulfa drugs appeared helpful. The management of liver disease continued to emphasize rest, avoidance of excessive alcohol and other potentially damaging materials, adequate diet and vitamins; salt restriction was necessary to control the accumulation of fluid within the abdomen.

Gall-Bladder.—Though removal of the gall-bladder (cholecystectomy) was helpful in most patients with gallstones requiring this operation, results were not satisfactory in 10% to 15% of patients. Three principal causes of the operative failures were (1) the presence of a disorder other than gallstones, unrecognized or improperly evaluated before operation; (2) incomplete surgery, with residual stones or a portion of the gall-bladder and its duct remaining; and (3) injury to the common bile duct, the normal channel for the transfer of bile from the liver and gall-bladder to the small intestine. The observations re-emphasized the importance of careful study of each patient before operation.

Pancreas.—Additional aids in the recognition of pancreatic disease included measurements of the fluid and enzyme response to secretin and the amount of chymotrypsin in the duodenal fluid. Pancreatitis, a serious disease, developed occasionally in patients with gallstones, after excessive intakes of alcohol and following operations upon the stomach and gall-bladder areas. The tissue destruction was attributed to the presence of a powerful enzyme, collagenase, in the pancreatic fluid. Treatment included medicines to decrease pancreatic secretion, correction of the blood volume deficit and the use of antibiotics. The presence of carcinoma of the pancreas occasionally was heralded by the development of thrombophlebitis. In cancer of the body and tail of the pancreas, visualization of the splenic and portal veins by the technique of percutaneous splenoportography demonstrated displacement of these vessels by a mass, facilitating the recognition of this difficult-to-diagnose cancer. An unusual tumour of the pancreas was found in a few patients with peptic ulcer secreting tremendous quantities of hydrochloric acid in the stomach, who had not responded consistently to medical treatment and who had developed recurrent ulcers after one or more operations. (See also SURGERY.)

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Strawberries: see FRUIT.

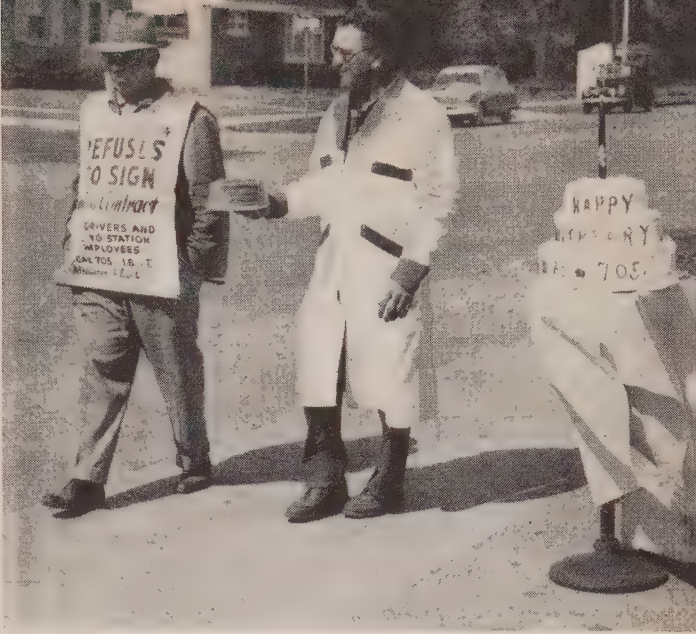
Strikes. **United States.**—An increase occurred in the level of strike activity in 1955 over the previous year. The number of work stoppages rose by 25% (from 3,468 in 1954 to 4,320 in 1955), the number of workers involved in work stoppages increased by 73% (from 1,530,000 in 1954 to 2,650,000 in 1955) and the number of man-days idle grew by 25% (from 22,600,000 in 1954 to 28,200,000 in 1955). On the other hand, the (unweighted) average duration of work stoppages, declined from 22.5 days in 1954 to 18.5 days in 1955. The average duration of strikes ending in 1955 was less than in any year since

World War II, except 1951. During 1955, the number of man-days idle was only 0.26% of the estimated working time of all workers. Only in two postwar years was this percentage lower than in 1955. In 1954 this figure was 0.21% and in 1951 it was 0.23%, while in 1953 it was 0.26%, the same as in 1955.

The general rise in strike activity affected most industries. Work stoppages and man-days of idleness in the manufacturing industries increased by about 40%, while in the nonmanufacturing industries there were increases of about 8% in the number of work stoppages and 6% in the man-days of idleness over 1954. During 1955, 28,200,000 man-days of idleness occurred. The manufacturing sector accounted for two-thirds of this total, and six manufacturing industries accounted for 72% of the man-days idle in the manufacturing sector. These industries were: machinery (except electrical), 3,800,000 man-days idle; electrical machinery, equipment and supplies, 3,300,000 man-days idle; transportation equipment, 1,900,000 man-days idle; fabricated metal products, 1,590,000 man-days idle; primary metal industries, 1,570,000 man-days idle; and textile mill products, 1,400,000 man-days idle.

As in other postwar years, wages and supplemental benefits were the most frequent issues in work stoppages in 1955. These issues accounted for half of the stoppages, two-thirds of the workers involved in stoppages and 63% of the man-days idle. Combined with questions of union organization, they were responsible for another 7% of the stoppages, 5% of the workers involved and 16% of the man-days idle during 1955. Questions of union organization alone produced 12.5% of the stoppages, 3.8% of the workers involved and 10.1% of the man-days idle. Disputes arising from other working conditions were responsible for 22.3% of the stoppages, 20.8% of the workers involved and 9.2% of the man-days idle. Finally, interunion or intraunion matters accounted for 6.9% of the stoppages, 2.5% of the workers involved and 1.0% of the man-days idle. The major strike issues were not reported in the remaining 1.4% of the work stoppages.

Since the merger of the American Federation of Labor and the Congress of Industrial Organizations did not take place until Dec. 1955, the strikes involving their affiliates can be attributed to the appropriate federation throughout that year. Unions affiliated with the American Federation of Labor were involved in slightly more than half of the work stoppages and accounted for 23% of the workers idle and a third of the idleness. About a fourth of these stoppages occurred in the construction industry. Affiliates of the Congress of Industrial Organizations took part in almost one-third of the year's strikes, idled three-fifths of all workers and accounted for two-fifths of the idleness. A large proportion of the stoppages involving unaffiliated or independent



PICKET REFUSES CAKE offered to him by owner of gasoline station in Morton Grove, Ill., celebrating in 1956 owner's first year of resisting demands that he sign a collective bargaining agreement with a local union of truck drivers, oil drivers, filling station and platform workers

unions were the brief, local strikes in bituminous coal mines. The unaffiliated unions accounted for a smaller proportion of total workers and idleness than in most years since World War II.

(P. TA.)

Major U.S. Strikes.—The most publicized strike during 1956 idled about 650,000 workers in the steel industry and shut down about 90% of the steel-producing mills during the month of July. The major issues in the strike involved length of contract, wage increases and premium pay for weekend work. The companies offered a five-year contract providing wage and fringe benefits which it was claimed would have increased the labour costs over the five-year period by 65 cents an hour; the Steelworkers union averred that the total cost of the package offered by the employers had been exaggerated and rejected the proposal as not being commensurate with recent rises in productivity. The union also opposed on principle a five-year contract. The steel companies and the union conducted extensive campaigns to present their views to the steelworkers and to the public.

A settlement was reached after a month's work stoppage, thus concluding what had been characterized as the most peaceful major strike in recent years. The agreement called for a three-year contract with increases in wages and fringe benefits variously estimated at 46 to 58 cents per hour by 1958. Hourly wage rates were boosted by 10.5 cents and additional hourly increases of 9.1 cents were scheduled during each of the two succeeding years. The contract further included supplementary unemployment compensation financed by the companies, liberalized health and welfare insurance, the addition of a seventh paid holiday and, for the first time in basic steel, premium pay for Sunday work. Provision was also made for wage increases proportionate to rises in cost of living as measured by the Department of Labor Consumer Price Index.

The longest major strike (involving more than 10,000 employees) in 20 years idled 70,000 Westinghouse employees, most of whom were members of the International Union of Electrical Workers (A.F. of L.-C.I.O.). The strike lasted 156 days and was settled in March 1956. The most significant issues in this controversy involved the duration of the contract, the size of wage increases and technical matters pertaining to the use of time studies and work standards in determining wage rates. It was a bitterly contested strike. Unions contributed more than \$2,000,000 to the striking workers. The final settlement called for a

Table 1.—United States: Work Stoppages, Workers Involved and Man-Days Idle*

Year	Work Stoppages		Workers involved†		Man-days idle during year		
	Number	Average duration (calendar days)‡	Number (000s)	% of total employed	Number (000s)	% of estimated working time of all workers	Per worker involved
1945	4,750	9.9	3,470	12.2	38,000	0.47	11.0
1946	4,985	24.2	4,600	14.5	116,000	1.43	25.2
1947	3,693	25.6	2,170	6.5	34,600	.41	15.9
1948	3,419	21.8	1,960	5.5	34,100	.37	17.4
1949	3,606	22.5	3,030	9.0	50,500	.59	16.7
1950	4,843	19.2	2,410	6.9	38,800	.44	16.1
1951	4,737	17.4	2,220	5.5	22,900	.23	10.3
1952	5,117	19.6	3,540	8.8	59,100	.57	16.7
1953	5,091	20.3	2,400	5.6	28,300	.26	11.8
1954	3,468	22.5	1,530	3.7	22,600	.21	14.7
1955	4,320	18.5	2,650	6.2	28,200	.26	10.7

*The number of stoppages and workers pertains to stoppages beginning in the year; average duration, to those ending in the year. Man-days of idleness include all stoppages in effect. †Workers are counted more than once in these figures if they were involved in more than one stoppage during the year. ‡Figures are simple averages; each stoppage is given equal weight regardless of its size.

Source: United States Department of Labor, Bureau of Labor Statistics, *Monthly Labor Review*.

Table II.—United States: Work Stoppages by Industry Group

Industry group	Stoppages beginning in 1955		Man-days idle during 1955 (all stoppages)	
	Number	Workers involved	Number	% of estimated working time of all workers
All industries	4,320*	2,650,000†	28,200,000‡	0.26
Manufacturing	2,420	2,000,000	18,800,000	.45
Primary metal industries	279	535,000	1,570,000	.47
Fabricated metal products (except ordnance, machinery and transportation equipment)	282	131,000	1,590,000	.57
Ordnance and accessories	13	10,800	140,000	.42
Electric machinery, equipment and supplies	147	202,000	3,300,000	1.15
Machinery (except electrical)	306	230,000	3,800,000	.95
Transportation equipment	200	440,000	1,910,000	.40
Lumber and wood products (except furniture)	81	11,800	227,000	.12
Furniture and fixtures	121	26,000	287,000	.31
Stone, clay and glass products	110	32,600	495,000	.35
Textile mill products	96	47,800	1,400,000	.51
Apparel and other finished products made from fabrics and similar materials	139	15,000	136,000	.04
Leather and leather products	50	40,400	542,000	.56
Food and kindred products	169	40,400	974,000	.25
Tobacco manufactures	3	340	1,220	‡
Paper and allied products	67	13,600	197,000	.14
Printing, publishing and allied industries	29	7,660	176,000	.08
Chemicals and allied products	105	40,000	634,000	.31
Products of petroleum and coal	18	3,190	51,000	.08
Rubber products	105	124,000	490,000	.69
Professional, scientific and controlling instruments; photographic and optical goods; watches and clocks	30	34,000	694,000	.87
Miscellaneous manufacturing industries	99	14,300	191,000	.16
Nonmanufacturing	1,913	646,000	9,390,000	.14
Agriculture, forestry and fishing	11	3,080	14,200	§
Mining	343	114,000	1,080,000	.57
Construction	733	204,000	1,810,000	.28
Trade	409	52,300	1,090,000	.04
Finance, insurance and real estate	8	550	27,300	§
Transportation, communications and other public utilities	275	253,000	4,860,000	.47
Services (personal, business and other)	121	17,800	488,000	§
Government (administration, protection and sanitation)¶	17	1,470	7,210	§

*This figure is less than the sum of the figures below it because a few stoppages extending into two or more industry groups have been counted in this column in each industry group affected; workers involved and man-days idle were divided among the respective groups. †In this and subsequent tables, the sum of the individual items may not equal the totals for the group because of rounding the individual figures. ‡Less than 0.05%. §Not available. ¶Municipally operated utilities are included under "Transportation, communications and other public utilities."

Source: United States Department of Labor, Bureau of Labor Statistics, *Monthly Labor Review*.

five-year contract with 3% annual wage increases during the first three years of the contract and 3.5% increases during each of the last two years of the contract. In addition, skilled workers received immediate increases up to 12 cents an hour. The controversy over time studies was resolved by compromise of the union and management positions.

Another strike of long duration involved the International Association of Machinists and Republic Aviation, a company engaged in the manufacture of jet planes for the United States government. The major issue in this work stoppage concerned the amount of wage increase. The strike was settled after 119 days and was accompanied by some violence. The contract was of a two-year duration and called for an annual increase of 7 cents an hour plus certain improvements in fringe benefits.

A 10-day strike involving the Amalgamated Meat Cutters and the United Packinghouse Workers, both A.F. of L.-C.I.O. affiliates, idled 25,000 Swift company workers in 26 states. The strikers won a 25-cent pay boost over a three-year period, a cost-of-living increase of 1 cent with each half point rise in the government Consumer Price Index and the liberalization of fringe benefits, but failed to secure a union shop which had previously been accepted by other major meat processors.

The Kohler strike, involving the United Automobile Workers and a producer of plumbing fixtures at Kohler, Wis., continued into its third year. Prior to the second anniversary of the strike in April 1956, the United States Mediation and Conciliation service made an attempt to effect a settlement but without success. The U.A.W. organized a boycott of Kohler products, and

claimed that this was effective in reducing company sales. The company denied these claims and averred that its production was close to the prestrike level. The U.A.W. was alleged to have spent in excess of \$8,000,000 in support of the strike.

The United States supreme court rendered an important decision in connection with the Kohler strike when it ruled that a state agency may act to prevent mass picketing or violence in a labour dispute, even when the controversy comes under the jurisdiction of the National Labor Relations board. The Wisconsin Employment Relations board had issued an injunction prohibiting mass picketing of the Kohler premises. The union appealed to the federal courts to invalidate the injunction on the ground that a state agency could not interfere in the case since the strike involved interstate commerce. The supreme court upheld the right of the state agency to issue the injunction.

(S. A. LN.)

United Kingdom.—The number of work stoppages arising from industrial disputes rose by 22% from 1954 (1,989) to 1955 (2,424). Similarly, increases occurred in the number of workers involved in all stoppages in progress and in the aggregate number of working days lost in all stoppages in progress. In 1954, the number of workers involved in all stoppages in progress was 450,000. This number rose by 49% to 670,900 in 1955. A larger percentage increase occurred in the aggregate number of working days lost in all stoppages in progress. About 3,794,000 working days were lost in all stoppages in progress in 1955, a 54% increase over the 2,457,000 days lost in the previous year. Both the number of stoppages beginning in the year, and the aggregate number of working days lost in the year in stoppages, were greater in 1955 than in any year since 1936. Only in 1944 and 1953 was the number of workers involved in stoppages, in progress in the year, greater than it was in 1955. About 2.3% of the total number of civil employment was involved in these

Table III.—United Kingdom: Industrial Disputes

Industry group	1955*		1954	
	Number of stoppages beginning in year	Number of workers involved in all stoppages in progress	Number of stoppages beginning in year	Number of workers involved in all stoppages in progress
Agriculture, forestry, fishing	2	2,200	2	†
Coal mining	1,793	353,600‡	1,464	204,400‡
Other mining and quarrying	1	†	2	100
Treatment of nonmetallic mineral products	14	1,500	13	1,400
Chemicals and allied trades	9	2,700	7	2,400
Metal manufacture	44	8,400	36	9,200
Shipbuilding and ship repairing	94	15,800	63	16,100
Engineering	73	17,300	52	13,100
Vehicles	76	62,800	46	33,400
Other metal industries	14	4,600	10	1,800
Textiles	12	2,400	15	1,300
Leather, etc.	1	100	—	—
Clothing	12	1,300	16	3,100
Food, drink, tobacco	11	600	7	400
Manufactures of wood and cork	21	1,300	13	1,300
Paper and printing	1	17,900	4	800
Other manufacturing industries	8	3,700	10	6,500
Building and contracting	96	13,500	75	37,300
Gas, electricity, water	2	100	5	500
Transport, etc.	115	153,800‡	125	112,500‡
Distributive trades	11	1,200	12	3,200
Other services	16	6,100	13	1,200
Total	2,424§	670,900‡	1,989||	450,000‡

*The figures for 1955 are provisional and subject to revision. †Fewer than 50 workers or 500 working days. ‡Some workers, largely in the coal mining and transport industries, were involved in more than one stoppage in the year, and have been counted more than once in the year's total. The net number of individuals involved in stoppages in progress during the year was approximately 499,000 in 1955, compared with approximately 349,000 in 1954. For coal mining alone the corresponding totals were approximately 228,000 and 139,000, while for transport the net totals were approximately 121,000 and 87,000. §A sympathetic stoppage in September involved workers in more than one industry group but was counted as only one stoppage in the total for all industries taken together. ||A stoppage of electricians which began in April 1954 involved workers in more than one industry group but was counted as only one stoppage in the total for all industries taken together. ¶Workers involved in more than one stoppage in any year are counted more than once in the year's total (see footnote ‡ above). Workers involved in a stoppage beginning in one year and continuing into another are counted in both years in the column showing the number of workers involved in stoppages in progress.

Source: Ministry of Labour Gazette.

stoppages, and the loss of time for each worker involved averaged nearly eight working days during 1955.

The largest number of stoppages of work arising from industrial disputes in 1955 occurred in the coal mining industry. These stoppages accounted for about one-third of the aggregate loss of time in 1955, and for about one-half of the total number of workers involved in all stoppages in the year. Substantial numbers of working days were lost as a result of disputes in the transport, vehicles and shipbuilding and ship-repairing industries. These industries, including the coal mining industry, accounted for 89% of the aggregate number of working days lost in all stoppages in progress during 1955.

Canada.—An increase of 27% occurred in the time lost in labour disputes in Canada from 1954 to 1955. In the former year, 1,475,000 man-working days were lost. A year later, in 1955, 1,875,000 man-working days were lost in labour disputes.

Four industries accounted for approximately 80% of the total man-working days lost. A total of 1,088,000 man-working days were lost in the motor vehicles and parts industry, 193,000 man-working days were lost in the aircraft, shipbuilding and farm implements industry, 119,000 man-working days were lost in other iron and steel industries and 90,000 man-working days were lost in the nonmetallics, chemicals and miscellaneous industry, as a result of industrial disputes in 1955.

Table IV.—Canada: Time Lost in Labour Disputes

Industry	1954 000 man-working days	1955
Manufacturing		
Food, animal and vegetable products	57.6	26.0
Tobacco and liquors	10.0	3.9
Rubber	0.5	1.7
Fur and leather products	0.2	9.0
Textiles and clothing	25.0	50.2
Pulp and paper products	3.4	34.8
Printing and publishing	0.1	6.9
Logging, lumber and products	33.1	14.7
Motor vehicles and parts	456.4	1,088.4
Aircraft, shipbuilding and farm implements	136.4	193.1
Other iron and steel	117.0	119.3
Electrical apparatus	20.3	71.7
Other nonferrous	19.2	78.8
Nonmetallics, chemicals and miscellaneous	61.3	90.4
Construction	202.7	37.2
Fishing and trapping	47.9	—
Coal	8.4	4.6
Other	187.7	12.6
Transport and public utilities	3.3	27.0
Trade, finance and service	84.6	5.0
Total, all industries	1,475.2	1,875.4

Source: Canadian Statistical Review, June 1956.

Labour disputes in the construction industry accounted for 203,000 man-working days lost in 1954. Only the motor vehicles and parts industry accounted for a greater loss of time in 1954. However, in 1955, only 37,000 man-working days were lost in the construction industry, as a result of labour disputes.

(See also LABOUR UNIONS; NATIONAL LABOR RELATIONS BOARD; NEWSPAPERS AND MAGAZINES.) (P. TA.)

Sudan. This republic in northeast Africa is bounded north by Egypt, east by the Red sea, Eritrea and Ethiopia, south by Kenya, Uganda and the Belgian Congo, west by French Equatorial Africa and northwest by Libya. Area: 967,500 sq.mi. Pop. (1955 est.): 8,960,000. Language: English, Arabic and various Nilotic and Negro tribal dialects in the south. Religion: in the six northern provinces the Sudanese, a Negro-Hamitic race, are almost entirely Sunni Moslem; in the three southern provinces, containing one-quarter of the country's population, the Negroes are mainly pagan, but one-fifth of them are Christian. Chief towns (pop., 1955 est.): Khartoum (cap.) 82,700, Khartoum North 44,200 and Omdurman 130,400—the three towns constituting one agglomeration divided by the joining there of the Blue and White Niles; Port Sudan 60,600. Prime ministers in 1956: Ismail el-Azhari, and (from July 5) Abdullah Khalil.

History.—Following the resolutions passed by the Sudanese house of representatives and senate, the Sudan became a sover-

eign independent state on Jan. 1, 1956. It was immediately recognized as such by all the leading nations and was admitted to the Arab league.

The new (transitional) constitution which came into force was substantially the same as that under which the country had lived—evolving toward complete independence—since 1952. The major differences were that the governor general, who had hitherto been British, was replaced as head of state by a council of state of five members and that the government became responsible to parliament for foreign affairs and certain other matters, which before had been reserved to the governor general.

This constitution was meant to be only temporary, and a constitution commission of 40 persons was set up to frame proposals to be submitted to the new parliament (when elected) for a permanent constitution.

Early in the year, as a result of strong representations, the National Unionist party, which was then in office with a comfortable majority under the leadership of the prime minister, Ismail el-Azhari, agreed to form a coalition government. In July, however, there was a major split in the party, a section of it joining the Umma party against El-Azhari who was thus deprived of office. The new government was a coalition of the People's Democratic party (formerly the Khatmia section of the Nationalist Union party), the Southern Liberal party (representing the south) and the Socialist Republican party. The prime minister was Abdullah Khalil, secretary of the People's Democratic party. The chief significance of this government was that it brought together the two principal religious sects of the country—the Ansar, or followers of Abdel Rahman el-Mahdi and the Khatmia or followers of Ali el-Mirghani, which had been in conflict for many years. The opposition consisted of the core of the National Unionist party, the old Ashigga group, under the leadership of Ismail el-Azhari. The five members of the council of state, it was agreed, should represent the different parties, and would continue to exercise the functions of head of state until the new constitution should be adopted, when the Sudanese republic would elect a single president.

During 1956 the Sudan formed its diplomatic service and began an exchange of ambassadors with the leading countries of the world.

The internal administration of the country proceeded satisfactorily except for an unfortunate incident in January. Following a riot at Kosti against the owners of cotton plantations, a large number of tenant farmers were arrested and imprisoned for one night in conditions of such airless congestion that many of them died. A strict inquiry was held by the authorities and those guilty of the negligence that caused the tragedy were punished. The work of restoring confidence and normal conditions in the south, after the mutiny of the previous year, was pursued, and although government control was not completely restored in the remoter parts of the country, the main administrative centres were functioning once again.

Negotiations with Egypt were resumed on the allocation of the volume of Nile waters expected to result from the building of the Aswan high dam, but the Sudanese were not satisfied with the Egyptian offer, and no agreement was reached. Like other Arab countries, the Sudan condemned the Anglo-French military action against Egypt. On Nov. 12 the Sudan was admitted to the membership of the United Nations.

(See also FRENCH WEST AFRICA.)

(E. S. AH.)

Education.—(1953-54) Schools: primary (including subgrade and Koran) 1,636, pupils 168,329; intermediate and vocational 101, pupils 15,343; secondary 23, pupils 4,333; teacher training colleges 19, students 1,645. University college of Khartoum (July 1954): students 616, teaching staff 94.

Finance and Banking.—Monetary unit: Egyptian pound with an exchange rate of £E0.348 to the U.S. dollar. Budget (1953-54 closed accounts): revenue £E35,436,422, expenditure £E27,611,034; (1956-57 est.): rev-

enue £E37,501,729, expenditure £E33,403,558. Total external debt (1956) £E9,218,890. Bank deposits (March 1954) £E13,939,906.

Foreign Trade.—(1954) Imports £E48,492,000, exports £E40,458,000. Main sources of imports (1954): U.K. 32.4%; Egypt 10.4%; India and Pakistan 11.8%; (1953): Italy 5.9%; Germany 5.3%; U.S. 2.6%. Main destinations of exports (1954): U.K. 42.2%; India and Pakistan 7.8%; Germany 4.6%; France (1953) 6.9%; Italy 7.6%; Egypt 8.8%; U.S. (1953) 2.5%. Main exports: cotton, cottonseed, gum arabic.

Transport and Communications.—Railways (1954) 3,956 km.; freight (1954) 1,108,800,000 ton-kilometres. Waterways 3,744 km. Roads (1954) 73,120 km. (few suitable for motor traffic). Motor vehicles in use (Jan. 1954): passenger 6,201; commercial (including buses) 5,935. Telephones (Jan. 1955) 13,712. Licensed radio receivers (1951) 6,000.

Agriculture.—Main crops (metric tons, 1955; 1954 in parentheses): cotton lint 87,000 (91,000); cottonseed 173,000 (165,000); sesame (1953-54) 29,400; peanuts (1953-54) 24,000. Miscellaneous production (metric tons, 1953): broad beans 3,000; dry beans 23,000; chick-peas 1,000; dates 23,900. Livestock (1955 est.): cattle 5,500; sheep 6,000,000; goats 5,000,000; camels 2,000,000; horses 20,000; asses 500,000.

Suez Canal Conflict.

The invasion of Egypt by Israel on Oct. 29, 1956, brought the Suez canal crisis (see MIDDLE EASTERN AFFAIRS) to a head. This invasion came as a complete surprise to the United States. As late as June 1, 1956, the Israeli prime minister, David Ben-Gurion, had declared that Israel must "refrain from initiating war even if provocation by Arab rulers is intensified." He acknowledged that war in the middle east would turn into a world conflagration and went on: "There is no greater danger than this in our days for the human race generally and for the Jewish people in particular." On Aug. 26 he again warned against a preventive war against the Arabs. Despite these assurances, the British and French were less surprised; in fact, the French seemed to have been well informed of Israeli plans in advance of Israeli action. The two powers defeated by their veto a United Nations Security council action to stop the Israeli invasion.

Anglo-French Move for the Occupation of the Suez Canal.—Israeli troops conquered the Sinai peninsula in a few days and occupied the port of Aqaba and the city and territory of Gaza, with its 200,000 Palestinian Arabs who had fled from the Israelis at the time of the war of 1948. On Oct. 30 Britain and France sent an ultimatum to Egypt and Israel. This ultimatum demanded that both countries withdraw their armed forces to a distance of ten miles from the Suez canal, though the canal was deep in Egyptian territory and about 150 mi. from the Israeli border. Egypt, to nobody's surprise, rejected this ultimatum. British and French forces from Cyprus then started the invasion of the Suez Canal Zone. The invasion was preceded by air bombardments of the Egyptian airfields to eliminate Egyptian air resistance to the invasion. Not until this was accomplished did British and French sea- and air-borne forces land on Nov. 5 and Nov. 6 in Port Said and in Port Fuad at the northern end of the Suez canal, occupy the two cities and move southward along the canal to El Cap, a point 22 mi. S. of Port Said. There their advance came to a halt.

The British and the French originally justified their action as a step to end the Israeli-Egyptian war. This war, however, offered the pretext for realizing two other objectives: the humiliation or overthrow of Gamal Abdel Nasser, president of Egypt, and the re-establishment of effective international control over the Suez canal. President Nasser had nationalized the Suez Canal company on July 26, 1956. He did it in a spirit of defiance of the western powers. Disappointed in his hope to receive arms and financial help from the west, Nasser had turned to the U.S.S.R. and had received considerable military equipment from communist lands. The French were eager to overthrow Nasser because they hoped thereby to repress more easily the demands of the Algerians for independence. The British and the French claimed later that their action prevented further Soviet penetration of the middle east and that it concentrated public attention on the need for finding equitable solutions to the Suez canal conflict and to the Arab-Israeli tension.

International Repercussions.—The Israeli-British-French aggression against Egypt coincided with the Hungarian revolution against Russian communist rule and with the ruthless suppression of this revolution by the U.S.S.R. The U.S.S.R. hoped to use the invasion of Egypt to turn world attention from the disturbed situation in the Soviet satellite states. For that, it tried to enlist the Asian and African nations in a campaign against Franco-British "imperialism." The Israelis, the British and the French were accused of using old-fashioned methods to impose their will upon the Arabs, methods no longer applicable in the middle of the 20th century when the Asian and African peoples were claiming equality of status with the western nations. The U.S.S.R. presented itself as the protector of the Arabs and of all Asian and African nations in their nationalist opposition to imperialist aggression. In a letter sent to Premier Ben-Gurion on Nov. 5, 1956, the Soviet premier, N. A. Bulganin, declared that "the Soviet government is at this very moment taking steps to put an end to the war and restrain the aggressors." He warned that "the government of Israel is criminally and irresponsibly playing with the fate of the world." But Soviet agitation in Asia and Africa was successfully countered by the United States, which restored the confidence of the nonwestern peoples in the moral forces in the west, when it moved in the general assembly of the United Nations for an end of Israeli-British-French aggression against Egypt and for the speedy evacuation of all the occupied territories by the invading forces. The stand taken by the United States led also to the revitalization of the United Nations, whose secretary-general, Dag Hammarskjöld, played an active role in the easing of the international tension. It should be noted however that a very large part of British public opinion of all parties, and some of the most influential press organs of England, sharply criticized the invasion of Egypt, both on moral grounds and on grounds of political practicability. Nothing similar to this protest was heard in France or Israel.

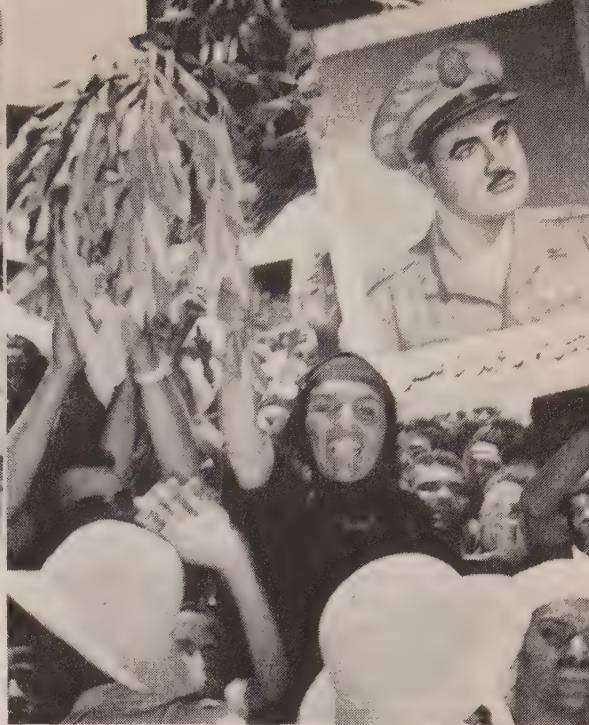
United Nations Action.—The general assembly of the United Nations voted on Nov. 2 and Nov. 7 almost unanimously for a cease-fire and for the withdrawal of the three invaders' forces from Egypt, which meant in the case of Israel a withdrawal behind the 1949 armistice demarcation line. Under the pressure of world opinion, of Soviet threats and of United States insistence, Britain, France and Israel agreed upon the withdrawal of their troops from Egypt. Israel did it most reluctantly, reversing a former declaration by Premier Ben-Gurion that Israel not only would not withdraw from any conquered territory but also would not allow any foreign troops under whatever name to be stationed in these conquered territories.

The United Nations established an international UN command force under the command of Maj. Gen. E. L. M. Burns, a Canadian. Consisting of soldiers of many nations, with the exclusion of the Great Powers, it proceeded to Egypt to supervise first the withdrawal of the Anglo-French forces from the northern end of the Suez canal and then the withdrawal of the Israeli forces to the 1949 armistice lines. On Nov. 20 Hammarskjöld called on Britain, France and Israel to explain their failure to withdraw from the occupied territory in compliance with the resolution of the general assembly. On Nov. 24 the general assembly, by a vote of 63 to 5, with 10 abstentions, called on the three invading powers to withdraw their forces "forthwith." The British and the French complied, and by Dec. 22 all their troops had evacuated Egyptian territory. United Nations forces helped to maintain order in the transitional period.

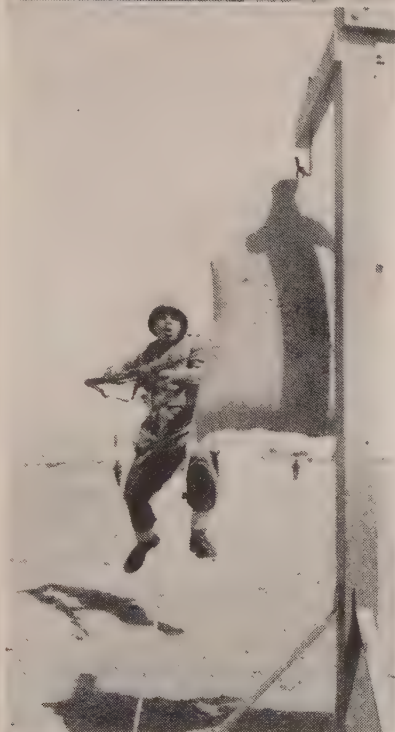
Arab Reactions.—As far as could be judged by the end of 1956, the invasion of Egypt did not diminish the prestige of President Nasser among the Arabs, but rather rallied them behind him. Nor were Arab-Israeli peace negotiations brought nearer, though the Israelis had claimed that they had invaded



Above: Israeli officer outlining a battle plan to his men, Oct. 31. The following day Israeli forces attacked on the northern front of the Sinai peninsula



Above: Cheering Egyptian woman demonstrating in front of a portrait of Gamal Abdel Nasser as his election as Egyptian president was announced in July



Above: Egyptian soldier engaged in bayonet practice during desert manoeuvres before the Israeli attack

SUEZ CONFLICT, 1956

Right: French soldier leading Egyptian prisoners captured at Port Fuad after the Anglo-French invasion Nov. 5



Below: British troops searching for snipers in the bombed-out buildings of Port Said



Egypt partly in order to force Egypt and the Arabs to enter into direct negotiations with Israel. In fact, the Israeli action increased Arab fears of future Israeli expansion and considerably broadened the already deep gulf of suspicion and hatred separating Israelis and Arabs. Of the Arab lands, Syria, like Egypt, though anti-communist, was willing to receive arms and support from the Soviet Union. Other Arab nations, however, while defending Arab rights against Israel and against western aggression, wished to keep the Soviet Union out of the middle east. On Nov. 13 nine Arab nations met in Beirut, Leb., to discuss their common problems. The kings of Jordan, Iraq and Saudi Arabia and the presidents of Syria and Lebanon were present to stress the importance of the meeting, while Libya, Yemen, Sudan and Egypt were represented by high-ranking diplomats. The aggression against Egypt was declared to be an aggression directed against all Arab states. The Arab spokesmen insisted on Israel's unconditional withdrawal behind the armistice line and promised support to the Algerian people in their struggle for the attainment of independence and sovereignty.

By far the most prowestern and anticommunist Arab nation is Iraq, which is a member of the Middle East Defense organization (MEDO), called the Baghdad pact after the capital of Iraq, where the original treaty was signed. The pact nations, with the significant exclusion of Great Britain, met on Nov. 8 in Tehran, Iran. They condemned Israeli aggression and declared that Israeli troops must be withdrawn immediately to the armistice line. The four pact nations, Turkey, Pakistan, Iran and Iraq proposed the United Nations 1947 resolution on the partition of Palestine as a basis for a possible Arab-Israeli settlement. The four nations met again late in November in Baghdad, where the representatives of Iran, Turkey and Pakistan were reported to have agreed with Iraq that Israel was the greatest threat to peace and order in the middle east. The Turkish premier and foreign minister and the Pakistani president and prime minister attended the meeting to stress its importance. On Nov. 26 Turkey withdrew its minister from Israel in order to strengthen the Baghdad pact. The attempts to draw other Arab nations into the pact failed, though Iraq took great pains to stress Arab solidarity. On Dec. 6 the Iraqi representative told the UN general assembly that on the Israeli issue "all the Arab world is Egypt and all Arab statesmen are Nassers." He demanded the repatriation of the Palestinian Arab refugees to their homes in Palestine.

Oil and the Suez Canal Conflict.—Great Britain and France acted originally in order to assure the unhampered flow to the west of middle eastern oil, on which the economy of western Europe depends, through the Suez canal and the pipelines. In 1947 Europe imported 40,000,000 tons of oil, of which 6,000,000 tons came from the middle east. In 1955 the import had risen to 130,000,000 tons, of which nearly 100,000,000 tons came from the middle east. Because of vastly increased domestic consumption, the United States had changed in the same period from an exporter to an importer of oil; hence the middle east was the main source of oil supply for Europe. In 1955 the middle east produced 162,000,000 tons, only about one-fifth of the world production, but the estimated oil deposits there amounted to roughly 70% of the world resources. Thus an interruption in the flow of oil seriously endangered western European economy and its future prospects.

As could have been foreseen, the invasion of Egypt did not promote and secure the flow of oil to the west but rather stopped it. To counter the invasion, Egypt put the Suez canal temporarily out of use and the Syrians wrecked the pipeline installations carrying Iraqi oil to the Mediterranean. As soon as it was clear that the British-French forces would withdraw, Egypt asked the United Nations to help clear the canal. The United Nations ap-

pointed Lieut. Gen. Raymond A. Wheeler, U.S. army, as director of the clearing operation. The Syrians promised to proceed with the repair of the pipeline as soon as the Israeli forces had complied with the United Nations resolution of withdrawing to the 1949 armistice line.

To alleviate the European oil shortage, U.S. oil companies increased their shipments of oil to western Europe from the ports along the Gulf of Mexico, beginning about the second week of November. Whereas throughout 1955 and in the first week of Nov. 1956 the daily shipments from the U.S. averaged 44,000 bbl., they reached a daily average of 944,000 bbl. in the last week of Nov. 1956, and for the following weeks an over-all target average of 550,000 bbl. per day was contemplated for the relief of the oil shortage in western Europe. Nevertheless western Europe, which before the Israeli-Anglo-French invasion of Egypt had gone through a period of great prosperity, faced, as a result of the Suez canal conflict, at least temporary economic difficulties and maladjustments.

(See also UNITED NATIONS.)

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Sugar. U.S. consumption of sugar in 1956 was indicated at 95.6 lb. per capita, slightly less than the 96.3 lb. of 1955, but not much changed from the pre-World War II level.

As the year proceeded, it became clear that the quota set in Dec. 1955 of 8,350,000 tons of sugar to be marketed in 1956 (as compared with 8,400,000 tons in 1955) was too restricted. In June the U.S. department of agriculture revised the distribution of sugar quotas in accordance with the new Sugar act and added 125,000 tons to the sugar quota, bringing the total to 8,475,000 tons. The quota was increased to 9,000,000 tons in December. In October the U.S. department of agriculture twice increased the quota of sugar that might be sold in the domestic market in 1956, reaching 8,775,000 tons. Prices reached the highest wholesale level of several years, and at retail advanced to approximate the previous high of about \$9 per hundredweight of Dec. 1923.

The Sugar act of 1948 was amended by public law 545 (May 29, 1956). In brief, the new law provided that when requirements exceed 8,300,000 tons a year, domestic producers shall be given a larger share of the market than under the previous legislation. Provisions included extension of the act through 1960. The domestic industry was awarded the right to supply 55% of the domestic market growth in consumption. The first 165,000 tons of increase in domestic sugar quotas would be divided 51.5% to the domestic beet area and 48.5% to the mainland cane area, with the next 20,000 tons of increase apportioned to Puerto Rico,

Table I.—U.S. Sugar-Beet Production of the Principal Producing States

State	(in 000 tons)		Average 1945-54
	Indicated 1956	1955	
California	3,506	3,365	2,901
Colorado	1,900	1,621	1,920
Idaho	1,540	1,433	1,296
Nebraska	852	655	729
Minnesota	748	771	502
Montana	740	724	709
Michigan	724	885	658
Washington	690	553	434
Wyoming	478	421	428
North Dakota	420	398	249
Utah	416	437	480
Oregon	391	381	367
Ohio	230	279	196
Kansas	102	96	58
Wisconsin	75	57	110
South Dakota	60	64	53

Table II.—U.S. Sugar-Cane Production

State	(in 000 tons)		Average 1945-54
	Indicated 1956	1955	
Louisiana	5,304	6,054	5,480
Florida	1,092	1,197	1,210

Table III.—Centrifugal-Sugar Production of the Principal Producing Countries

Country	(In 000 of tons, raw value)		Average 1945-49	Average 1935-39
	Indicated 1956-57	1955-56		
Cuba	5,700	5,225	5,898	3,183
U.S.S.R.	4,400	4,000	1,643	2,761
Brazil	2,684	2,464	1,420	830
India	2,475	2,340	1,319	1,303
United States	2,435	2,303	1,969	1,991
France	1,620	1,798	823	1,078
Western Germany	1,430	1,424	523	610
Republic of the Philippines	1,205	1,219	384	1,058
Puerto Rico	1,200	1,151	1,143	982
Hawaii	1,200	1,100	861	980
Italy	1,100	1,317	331	414
Mexico	970	870	636	353
Indonesia	900	938	102	1,207
Argentina	900	687	654	510
Formosa	900	875	346	1,240
Union of South Africa	875	939	542	498
United Kingdom	800	747	612	515
Peru	760	750	485	444
Dominican Republic	750	706	509	491
Mauritius	590	588	351	320

the next 3,000 tons of increase to the Virgin Islands, with further increases in domestic quotas prorated among the five domestic areas. The 45% of market growth assigned to foreign countries was allocated 29.6% to Cuba and 15.4% to other foreign countries. The existing quota of 980,000 tons for the Philippines was retained.

Domestic production of sugar was indicated at about 2,400,000 tons, almost one-fourth above prewar but well below the 2,610,000 tons of 1954. The cane crop for sugar and seed was indicated at 6,396,000 tons, sharply down from 7,251,000 tons in 1955 and an average for 1945-54 of 6,689,000 tons.

Sugar beets were estimated at 12,962,000 tons, 6% above 1955 and 15% over the 1945-54 average. Area for harvest was 789,000 ac., more than 6% above 1955 and slightly above the ten-year average. Yields were 16.4 tons per acre, 0.1 ton below the record of 1955. It appeared necessary to continue the limitation on sugar-beet acreage which became effective with the 1955 crop.

Miscellaneous sweets added substantially to the total. The honey crop of 213,719,000 lb. from 5,315,000 bee colonies was 16% less than in 1955. Extracted honey was supported at 9.7 cents per pound but market prices were generally higher. Adverse weather reduced the maple harvest. The number of maple trees tapped was 6,335,000 against 6,708,000 in 1955; 115,000 lb. of maple sugar and 1,592,000 gal. of syrup were produced, both well below the 1955 total. Sorghum and cane for syrup were below average.

U.S. sugar imports in 1955-56 were 4,186,000 tons valued at \$440,524,000; data for the previous year were 3,483,000 tons and \$374,831,000.

World production and consumption continued in an expanding phase, reaching a new high record of 44,457,000 tons as compared with 42,770,000 tons in 1955-56 and an average of only 28,536,000 tons prewar. Of the total, 26,772,000 tons were cane and 17,685,000 tons were beet sugar. Production of the less refined noncentrifugal sugar was 6,444,000 tons in 1955. Cuba continued to restrict production and reduce stocks. Carry-over of world sugar supplies at the end of the year was estimated at only about 1,000,000 tons, of which 800,000 would be held by Cuba, whereas Cuba alone had held stocks of more than 3,000,000 tons in some recent years.

World sugar-beet production, primarily in Europe, the U.S.S.R. and the United States, increased to about 129,300,000 tons in 1956, 4.5% larger than the 123,746,000 tons of 1955 and far above the average 68,374,000 tons of 1945-49 or the average 82,071,000 tons of prewar 1935-39. Acreage expanded to 12,849,000 ac., about 50% above prewar and comparable with 12,068,000 ac. in 1955. Whereas in 1955 the International Sugar council was confronted with greatly increased amounts of sugar available on the world market at prices averaging slightly below 3.25 cents per pound (the minimum of the range within which it

attempts to stabilize world sugar prices), the situation in 1956 was much firmer. Prices fluctuated between 3.15 and 3.85 cents per pound, averaging about 3.40 cents for the year, with some indication of greater strength in 1957. The International Sugar conference, meeting in Geneva, Switz., in October, raised export quotas for 1957 by 577,000 tons to 5,547,000 tons total for members.

(J. K. R.)

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Suicide Statistics. The suicide rate in the United States for 1956 was about the same as for 1955, according to provisional data for the first seven months of both years. For this period, the rate in 1956 was 10.3 per 100,000 population. During the entire year 1955 there were 16,200 suicides, and the rate was 9.9 per 100,000 population, or about 2% less than the rate for 1954.

The frequency of suicide increases with advance in age. In 1955 the suicide rates per 100,000 population at the various ages were: 15-24 years, 4.5; 25-34 years, 8.4; 35-44 years, 11.0; 45-54 years, 18.3; 55-64 years, 24.8; 65-74 years, 25.1; 75-84 years, 28.0; and ages 85 and over, 19.8. In 1955 the rates per 100,000 population according to race and sex were: white males,

Suicide Rates per 100,000 Population in Selected Countries

Country	1954	1953	Country	1954	1953
Japan	23.4	20.5	Luxembourg	10.4	8.9
Denmark	23.3	24.1	New Zealand	8.9	9.9
Austria	23.1	23.4	Ceylon	8.0	7.0
Switzerland	22.6	21.8	Norway	7.4	7.7
Germany (western)	19.3	18.2	Canada	7.3	7.1
Finland	18.9	17.4	Netherlands	6.2	6.5
France	15.8	15.3	Scotland	5.9	5.5
Belgium	13.8	13.5	Northern Ireland . .	3.5	3.3
England and Wales	11.4	10.8	Ireland	2.0	2.3
United States	10.1	10.1			

Source: World Health Organization, *Epidemiological and Vital Statistics Report*, vol. 9, no. 4 (1956).

16.3; white females, 5.1; nonwhite males, 5.5; and nonwhite females, 1.9.

Within the U.S., the Pacific coast states usually record the highest rates and the south central states the lowest. The suicide rates per 100,000 population in 1954 were: New England, 9.5; middle Atlantic, 8.7; east north central, 10.4; west north central, 11.1; south Atlantic, 9.7; east south central, 7.8; west south central, 7.8; mountain, 12.4; Pacific, 15.7.

(M. Sp.)

Sulphur. Total world production of sulphur is shown by countries in MINERAL AND METAL PRODUCTION AND PRICES. Of the total produced in 1955, the United States contributed more than 90%. Italy and Japan continued to supply most of the remaining 10%.

United States.—Output of sulphur, consisting of native (Frasch) sulphur of 97% or greater purity, attained a record high in 1955. The production of native sulphur was 4% and of recovered sulphur 12% greater than in 1954. Sales greater than production caused a slight reduction in sulphur stocks. Output in 1955 was expanded considerably by the new Chacahoula mine in Louisiana which went into operation in Feb. 1955.

Data on Sulphur Industry in the United States

	(In 000 short tons)					
	1950	1951	1952	1953	1954	1955*
Production (native)	5,815.2	5,911.6	5,928.3	5,774.0	6,177.4	6,432.5
Shipments	6,165.3	5,586.7	5,758.4	5,851.1	5,978.6	6,539.5
Exports (crude)	1,613.9	1,442.3	1,460.7	1,390.5	1,845.5	1,789.7
Available supply	4,551.4	4,144.4	4,297.7	4,460.6	4,133.1	4,749.8
Consumption	4,657.5	4,241.0	4,175.6	4,430.8	4,069.4	4,683.9
Stocks (producers')	2,973.0	3,177.9	3,437.1	3,385.2	3,615.4	3,562.9
By-product recovery	159.6	206.1	281.3	382.7	400.3	449.8

*Preliminary.

In the first six months of 1956, output of native sulphur was 3,478,848 short tons and of recovered sulphur, 255,808 tons.

Mexico.—In 1955 a large mine began operating by the Frasch method. The industry had expanded so much that Mexico was

able to enter world markets with a large exportable surplus.

Poland.—According to the British Sulphur Corp., Ltd., *Quarterly*, no. 11 (Dec. 1955), a number of deposits of sulphur of commercial importance had been discovered in the Dandomierz area of southern Poland. The largest, believed to have been under active development since 1954, was said to contain more than 50,000,000 metric tons. The expected output was estimated to be enough to produce 200,000 tons of refined sulphur a year.

(F. E. H.)

Sumatra: see INDONESIA.

Summerfield, Arthur E(IIsworth) (1899—), U.S. government official, was born at Pinconning, Mich., on March 17. He worked in various automobile plants and in real estate, and in 1924 became distributor in Flint, Mich., for the Pure Oil company.

In 1929 he founded the Summerfield Chevrolet company and in 1938 became president of the Bryant Properties corporation. He first became active in Republican politics during Wendell Willkie's campaign for the presidency in 1940. In July 1949 he was appointed to the chairmanship of the Republican strategy committee and in July 1952 he was elected chairman of the Republican national committee.

On Nov. 25, 1952, Pres.-elect Dwight D. Eisenhower selected Summerfield to serve as U.S. postmaster general. He was confirmed by the U.S. senate on Jan. 21, 1953, and was sworn into office the same day.

During 1954, 1955 and 1956 Summerfield made strenuous but unavailing efforts to secure from congress an increase in postal rates in order to cut the post office department's annual deficit.

Support Prices: see AGRICULTURE.

Supreme Court of the United States. The annual term of the court began Oct. 3, 1955, and ended June 11, 1956. Harold B. Willey, clerk of the court since 1952, retired as of June 30, 1956, and was succeeded by John T. Fey, former dean of the George Washington university law school. Associate Justice Sherman Minton retired on Oct. 15, 1956, and William Joseph Brennan, Jr., was appointed to take his place.

The court experienced its busiest term in history. There were 1,856 cases on the docket compared with 1,566 the term before; 1,637 cases were disposed of whereas the previous high was 1,520 in 1946. The court heard oral argument in 123 cases compared with 105 the previous year. There were 82 full opinions, four more than during the previous term, and 52 dissenting opinions. There were also 19 concurring opinions and 4 designated separate opinions.

Members of the Court.—The United States supreme court in 1956 was composed of the following members (dates indicate year appointment was confirmed by the senate): chief justice, Earl Warren (1954); associate justices, Hugo L. Black (1937), Stanley Reed (1938), Felix Frankfurter (1939), William O. Douglas (1939), Harold H. Burton (1945), Tom C. Clark (1949), John M. Harlan (1955) and William Joseph Brennan, Jr. (appointed 1956). (See also LAW.)

(H. B. Wy.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*The Supreme Court of the United States* (1954); *John Marshall* (1950).

Surgery. During 1956 F. J. Lewis and his co-workers at the University of Minnesota reported the repair of two hearts in which there were only three chambers instead of four, which were successfully operated upon under refrigeration anaes-

thesia. D. S. Leighninger reported the end results in a series of patients operated upon by increasing the blood supply to the heart muscle following the production of adhesions by powder dust of asbestos placed in the cavity surrounding the heart. In a series of 83 patients operated upon between 1935 and 1953 the mortality within the first two years was 18%, and in a group of 103 patients followed for more than six months the pain was either absent or greatly relieved in 90%. J. R. Keys and his co-workers at the Mayo clinic reported 100 cases of patients with coronary heart disease who had associated gall-bladder disease. Ninety-nine of the 100 had gallstones. Although these patients were supposed to be poor risks, there were only three deaths, and in only one was insufficient blood supply to the heart, because of the coronary disease, thought to be a contributory cause. Sixty-four of the patients were observed six years after the operation; 17 of these were definitely improved, 7 were worse and 36 reported no change in their heart symptoms.

The re-establishment of circulation in the extremities by shunting around obstructive areas was emphasized by R. R. Linton. He advocated replacing a blood vessel by one taken from another person, joining it to the vessel in the pelvis and implanting the distal end into the vessel in the leg, in this way circumventing the obstruction of the artery. W. S. Edwards and J. S. Tapp employed a similar procedure, using chemically treated nylon tubes. Both these methods were successful in relieving circulatory disorders of the extremity.

A not infrequent occurrence in elderly persons, particularly in those who are fat, is hernia of the diaphragm. This is attended occasionally by severe digestive symptoms and frequently by marked anaemia caused by ulceration of the stomach and loss of blood. Although the hernia can be repaired by closing the opening in the diaphragm, it was suggested by R. Nissen that the symptoms could also be relieved by anchoring the stomach to the abdominal wall and thus preventing the stomach from herniating into the chest.

In order to facilitate the early diagnosis of cancer of the oesophagus and the upper part of the stomach, K. Nakayama of Japan suggested the use of radioactive phosphorus, which, because of the extremely rapidly growing tumour, becomes localized in a high concentration in the tumour, permitting early diagnosis. He found that a tumour of the oesophagus takes up more than three times as much radioactive phosphorus as does normal tissue. It was suggested that radioactive gold might be injected in the region of the tumour, because it is taken up by the regional lymph glands and in this way might be active in destroying the tumorous nodes. C. G. Thomas, Jr., however, on the basis of 35 patients treated in this way, came to the conclusion that this form of treatment does relatively little good and might even be hazardous because of the possibility that radioactive material might by-pass through cancerous lymph nodes and extend to distant, noncancerous nodes.

Ulcer of the duodenum is almost invariably the result of an ulcer tendency in the patient plus the effect of acid on the duodenum. Most methods of treatment are directed toward the control of acid. R. M. Zollinger and E. H. Ellison called attention to the fact that there is a rare type of persistent ulcer which may occur as a result of a tumour of the pancreas. Patients with these ulcers, in contrast with the average patient with an intractable ulcer, are not relieved by more extensive operations on the stomach, but are relieved by removal of the tumour of the pancreas.

Because of the difficulty in making early diagnosis of cancer of the stomach, it was suggested that routine X-rays of the stomach be made in men past the age of 40. It is generally conceded that this is not feasible unless the person has total ab-

sence of acid in the stomach. J. R. Amberg and L. G. Rigler, in a group of 39 patients who previously had been examined and in whom either nothing or a benign ulcer was found, discovered that in subsequent examinations (at intervals of from 6 to 48 months) cancer subsequently appeared. The operability in this group of patients was 90%, as contrasted with 77% in a group in whom symptoms preceded the examination. The resectability was 72% in the former group and 47% in the latter group. The cancer was apparently limited to the stomach, as evidenced by the absence of lymph gland involvement in 46% in the former and in only 15% in the latter. These statistics illustrate the necessity of careful, repeated examinations of all noncancerous tumours of the stomach and the danger of treating ulcer of the stomach (not the duodenum) by medical means.

A polyp of the colon is considered by most persons to be a precancerous lesion, and certainly all multiple polyps, particularly in patients with a familial tendency toward cancer, are definitely precancerous. There are many who believe that a complete removal of the colon should be done as soon as the diagnosis is made, because it is generally conceded that these tumours which number in the thousands in the colon will ultimately become malignant if the patient lives long enough. In order that the patient may have relatively normal bowel movements and not have an ileostomy, I. Teicher and J. I. Abrahams advocated removal of the colon, except the rectum, and anastomosis of the small intestine to the rectum. By proctoscopic technique the polyps in the rectum can be removed and this segment of the colon can be carefully examined from time to time to determine whether new polyps are developing and whether there is any evidence of the development of cancer. If the latter does occur, obviously resection of this segment of the colon must be done.

(See also ELECTRONICS; HEART AND CIRCULATORY DISEASES.)

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Surinam (DUTCH GUIANA) lies between British Guiana to the west and French Guiana to the east, and has an area of 55,143 sq.mi. It is an integral part of the kingdom of the Netherlands, but enjoys sovereign autonomy in all domestic matters. Its population (1956 est.) of 240,000 lives chiefly on the coastal plain; less than 40,000 live on the extensive plateau to the south, where they are engaged chiefly in mining and timber enterprises. The capital is Paramaribo, pop. (1956 est.) 95,000. The population is about one-half of Asiatic origin, India and Indonesia being the areas of chief importance. Persons of European, African or indigenous stock, predominantly in mixed strains, constitute a minority. The official language is Dutch, but various dialects prevail; English is generally understood. During 1956, J. van Tilburg was governor, and J. H. E. Ferrier was prime minister.

History.—The so-called "Unity group" of small parties con-

tinued in control of the legislative body, called the *staten*, consisting of 21 members. Its presiding officer was H. C. van Ommeren, of the Democratic party. The new constitution worked smoothly so far as Surinam was concerned. At the end of 1955, a parliamentary delegation from the Netherlands visited Surinam as guests of the *staten*.

Progress continued to be made during 1956 in carrying out the public works and developmental program initiated in accordance with the extensive study of the International Bank for Reconstruction and Development, but going beyond the proposals in that study. Ten years' work, with a cost well above \$60,000,000, was involved in two large hydroelectric plants, extensive road construction, several canals, an airport, model farm development, forest and mining enterprises and large-scale fisheries and fish-processing plants. Technical assistance from the U.S. government was secured during 1956 for many phases of this program. Legislation was under consideration to provide exemption from taxation of new enterprises for ten years, as well as additional customs exemptions.

(See also NETHERLANDS ANTILLES.)

(C. E. Mc.)

Education.—On Jan. 1, 1956, there were 182 elementary schools with 1,201 teachers and 42,531 pupils, 12 advanced and higher elementary schools with 170 teachers and 4,346 pupils, 1 secondary school with 48 teachers and 230 students and 4 normal schools with 723 students.

Finance.—The monetary unit is the Surinam gulden or florin, valued at 53.0264 cents U.S. currency, official rate, in 1956. The 1956 budget estimated revenue and expenditure at 40,657,000 florins; revenue in 1955 was 39,276,000 florins and expenditure 43,184,000 florins. Currency in circulation on June 30, 1956, totalled 14,236,895 florins.

Trade and Communications.—Exports in 1955 totalled 49,684,000 florins; imports, 51,610,000 florins. Leading exports were bauxite (over 80%), timber, rice and coffee. Leading customers were the U.S. (70%), Canada (10%) and the Netherlands (8%); leading suppliers, the U.S. (33%), the Netherlands (32%), Trinidad (10%) and the U.K. (7%).

Internal transportation is largely by water; on Dec. 31, 1955, there were 83 mi. of railway, 525 mi. of roads, 3,551 telephones and 3,031 motor vehicles. Vessels entered in 1955 totalled 800 of 1,804,082 net registered tons; vessels cleared, 803 of 1,809,357 tons. In 1955, 564 commercial aircraft landed at Zandery airfield.

Production.—Figures for 1955 included bauxite 3,060,000 metric tons; gold 7,235 troy ounces; balata 183 tons; sugar 7,401 tons; rice (paddy) 64,526 tons; timber 121,400 cu.m.; rum 222,435 U.S. gal.; molasses 335,500 gal.

(J. W. Mw.)

Svalbard: see NORWAY.

Swains Island: see SAMOA, AMERICAN.

Swaziland: see BRITISH SOUTH AFRICAN TERRITORIES.

Sweden. A democratic monarchy of northern Europe, Sweden has an area of 173,564 sq.mi. Pop. (1956 est.) 7,290,000. Capital: Stockholm, pop. (1955 est.) 776,947. Other principal cities (pop., Jan. 1, 1955): Göteborg 373,433; Malmö 205,640; Norrköping 88,295; Helsingborg 73,342; Örebro 70,412; Uppsala 68,596. Religion: Lutheran Christian. Ruler in 1956: King Gustav VI Adolf. Prime minister: Tage Erlander.

History.—Although governmental policy moved steadily leftward during 1956, the electoral movement was clearly toward the right. In the September elections for the second chamber the trend of several years was strongly emphasized: the Conservatives won 11 new seats, and the Farmers' Union-Social Democrat coalition lost 11 seats; the liberal Folk party held its own, and the Communists won one additional member (the total number of seats was increased from 230 to 231); 79.4% of the voters went to the polls.

	%	1952 seats	pop. vote	1956 %	seats
Conservatives	14.4%	31	663,742	(17.2%)	42
Farmers' Union	10.7%	26	366,567	(9.4%)	19
Social Democrats	46.1%	110	1,729,501	(44.6%)	106
Folk party	24.5%	58	923,551	(23.8%)	58
Communist	4.3%	5	194,017	(5.0%)	6

For the first time in 25 years the Socialists were outnumbered, although as long as the Farmers' Union (*Bondeförbundet*) stood with the Social Democrats the coalition could muster a majority with 125 votes. If the Farmers' Union should shift allegiance to their more natural allies, the Conservatives and



ROYAL BARGE, carrying Queen Elizabeth II of Great Britain, arriving at the town hall, Stockholm, during her visit to Sweden in 1956

the liberal Folk party, such a combination could claim a slim majority with 119 votes. For the present, however, the Farmers' Union were remaining with the Social Democrats.

It was believed that the coalition's narrowed margin of power and the popular trend of opinion would probably put brakes on further socialization, but no sharp change in policy was indicated. In the first chamber, much slower to respond to shifts in the electorate, the Social Democrats retained a clear majority with 78 seats out of 150. For the occasional joint votes of the two chambers the Social Democrats controlled 184 against a possible 188 for Farmers' Union, Conservatives and the Folk party, and 9 for the Communist party.

Leaders of the U.S.S.R. repeatedly praised the neutrality of Sweden, and official visits were exchanged, but the relations between the two countries continued tense. Most annoying to Sweden's national pride and sense of justice was the Soviet handling of the Wallenberg affair. Raoul Wallenberg, architect and scion of a great banking family, had gone to Hungary toward the end of World War II and had done a notable job in saving Jews from Nazi persecution. When the Soviet forces entered Budapest in Jan. 1945 Wallenberg was last seen going off with several Soviet soldiers. Reports persisted that the victim had been seen in concentration camps in the U.S.S.R., and the Soviet government repeatedly promised investigation and information. But nothing was forthcoming, and after 11 years the Swedes were thoroughly aroused.

Antagonism was heightened by the uncovering in Sweden of the fourth case in five years of Communist espionage. In Aug. 1956, after six months of careful police work, Anatole Erikson, a Russian-born instrument maker at the L. M. Ericsson Telephone company, was arrested for photographing and selling to the Russians information on Sweden's latest radar developments. Peter Miroshnikov, member of the Soviet's trade delegation in Stockholm, was expelled for his part in the affair.

At the end of 1955 Sweden attempted a general nationwide wage negotiation between the associations of employers and employees. The result was an increase of 4% in wages for almost all workers in 1956.

(F. D. S.)

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Education.—Schools (1954): primary 8,777, pupils 758,201, teachers 38,862; secondary 390, pupils 166,807, teachers 10,994; vocational (trade) 507, pupils 109,364; students at other vocational institutes 29,118; teachers' training colleges 28, students 5,300. Institutions of higher education 16 (including 4 universities), students 20,800, teaching staff 2,695.

Finance and Banking.—Monetary unit: krona (pl. kronor), with an exchange rate of 5.17 kronor to the U.S. dollar. Budget: (1955–56 est.) revenue 9,000,000,000 kronor, expenditure 8,200,000,000 kronor; (1956–57 est.) revenue 11,173,000,000 kronor, expenditure 10,225,000,000 kronor.

Public debt (March 1956) 15,884,000,000 kronor. Currency circulation (Jan. 1955) 4,940,000,000 kronor, (Jan. 1956) 5,130,000,000 kronor. Deposit money (Jan. 1955) 5,660,000,000 kronor, (Jan. 1956) 5,570,000,000 kronor. Gold and foreign exchange (March 1955) U.S. \$560,000,000, (March 1956) U.S. \$572,000,000.

Foreign Trade.—(1955) Imports 10,297,000,000 kronor; exports 8,949,000,000 kronor. Main sources of imports: Germany 22%; other continental E.P.U. (European Payments Union countries) 30%; U.K. 14%; U.S. and Canada 10%; Latin America 7%. Main destinations of exports: U.K. 20%; Germany 13%; other continental E.P.U. 38%; Latin America 6%; U.S. and Canada 6%. Main exports: wood pulp 18%; wood 15%; iron ore 9%; paper 10%.

Transport and Communications.—Roads (rural public, 1955) 91,236 km., (total, 1953) 173,000 km. Motor vehicles in use (June 1955): passenger 589,976, commercial 108,211. State railways (1954) 15,176 km; passenger-km. (1954) 6,138,000,000; freight, ton-km. (1955) 9,600,000,000. Shipping: merchant vessels of 100 gross tons and over (July 1955) 1,217; total tonnage 2,807,166. Air transport (1955): 473,928,000 passenger km.; cargo, ton-km. 12,684,000. Telephones (Jan. 1955) 2,097,738. Radio-receiving sets (Dec. 1954) 2,391,000.

Agriculture.—Main crops (metric tons, 1955; 1954 in parentheses): wheat 747,000 (1,020,000); barley 423,000 (360,000); oats 634,000 (861,000); rye 176,000 (301,000); potatoes 1,284,000 (1,429,000); sugar beet 1,468,000 (1,848,000); rapeseed 137,000 (156,000); broad beans 90,000 (111,000). Livestock (Sept. 1955): cattle 2,575,000; sheep 177,000; horses 312,000; pigs 1,575,000; chickens (1954) 11,751,000. Fish landings (1954) 184,400 metric tons.

Industry.—Fuel and power (1955): coal 280,800 metric tons; electricity 24,972,000,000 kw. hr. Production (metric tons, 1955): iron ore (metal content, 60%) 17,448,000; pig iron 1,172,400; crude steel 2,148,000; cement 2,544,000; cotton yarn 27,240; wool yarn 16,560. Ore production (metal content, 1954): copper 13,300; lead 29,700; zinc 58,400; tungsten 274; gold 2,643 kg. Lumber production (1954): sawn softwood 7,413,000 cu.m.; wood pulp 3,641,000 metric tons. Merchant vessels launched (100 gross tons and over, 1955) 524,400 gross tons.

ENCYCLOPÆDIA BRITANNICA FILMS.—*Laplanders* (1952); *People of the Reindeer* (Wind from the West) (1956); *Scandinavia—Norway, Sweden, and Denmark* (1950); *Sweden* (1955).

Sweet Potatoes: see POTATOES.

Swimming. Athletes from the United States and Australia dominated the sport in 1956, a year unsurpassed for breaking records. Among the top U.S. swimmers were George Breen of Cortland (N.Y.) State Teachers college and Bill Yorzyk of the New Haven (Conn.) Swim club. Breen set a world record at New Haven on March 29 when he swam the 1,500-m. free style

Table I.—National A.A.U. Men's Swimming and Diving Winners

(Indoors, New Haven, Conn., April 5–7, 1956)				
Event	Winner	Affiliation or city	Time	
100-yd. free style	Rex Aubrey	New Haven S.C.	49.1 sec.*†‡	
220-yd. free style	Dick Hanley	Ann Arbor, Mich.	5.9 sec.	
440-yd. free style	George Breen	Cortland, N.Y.	4 min. 30.1 sec.	
1,500-m. free style	George Breen	Cortland, N.Y.	18 min. 20.2 sec.§	
100-yd. backstroke	Al Wiggins	Pittsburgh, Pa.	57.0 sec.	
220-yd. backstroke	Frank McKinney	Indianapolis, (Ind.) A.C.	2 min. 21.7 sec.*	
100-yd. breast stroke	Don Kutyna	U.S. Military academy	1 min. 3.0 sec.*†	
220-yd. breast stroke	Dick Fadgen	North Carolina A.C.	2 min. 37.1 sec.*††	
100-yd. butterfly	Al Wiggins	Pittsburgh, Pa.	54.5 sec.*†††	
220-yd. butterfly	Jiro Nagasawa	Japan Swim fed.	2 min. 19.4 sec.*††	
400-yd. medley	Tim Jecko	New Haven S.C.	4 min. 46.6 sec.	
400-yd. medley relay	North Carolina A.C., (Bill Sonner, Dick Fadgen, Jack Nelson, Dave McIntyre)		3 min. 46.0 sec.*††	
400-yd. free-style relay	New Haven S.C., (Dan Cornwell, Dave Armstrong, Sandy Gideonse, Rex Aubrey)		3 min. 22.2 sec.	
1-m. diving	Bob Clatworthy	U.S. Army	531.2 pt.	
3-m. diving	Don Harper	Columbus, O.	542.6 pt.	
Team	North Carolina A.C.		72 pt.	
(Outdoors, Cuyahoga Falls, O., July 27–29, 1956)				
100-m. free style	Dick Hanley	Ann Arbor, Mich.	56.3 sec.*†	
200-m. free style	Bill Woolsey	Hawaii	2 min. 6.6 sec.†	
400-m. free style	George Breen	Buffalo A.C.	4 min. 37.6 sec.	
1,500-m. free style	George Breen	Buffalo A.C.	18 min. 27.6 sec.	
100-m. backstroke	Yoshi Oyakawa	Coca Cola S.C., Cincinnati, O.	1 min. 5.9 sec.	
200-m. backstroke	Frank McKinney	Indianapolis A.C.	2 min. 24.5 sec.*	
100-m. butterfly	Al Wiggins	Pittsburgh, Pa.	1 min. 4.2 sec.	
200-m. breast stroke	Dick Fadgen	North Carolina A.C.	2 min. 45.8 sec.†	
200-m. butterfly	Bill Yorzyk	New Haven S.C.	2 min. 24.3 sec.*†	
100-m. breast stroke	Bob Hughes	Club del Mar, Santa Monica, Calif.	1 min. 11.2 sec.*†	
400-m. medley	Bill Yorzyk	New Haven S.C.	5 min. 19.0 sec.*†	
400-m. medley relay	New Haven S.C., (Jerry Dalbey, Deed Hardin, Bill Yorzyk, Dave Armstrong)		4 min. 26.5 sec.*	
800-m. free-style relay	New Haven S.C., (Dave Armstrong, Roger Anderson, Tim Jecko, Bill Yorzyk)		8 min. 53.7 sec.	
3-m. diving	Bob Clatworthy	New York A.C.	510.15 pt.	
Platform diving	Gary Tobian	Los Angeles A.C.	511.45 pt.	
Team	New Haven S.C.		65° pt.	

*New championship meet record. †New U.S. record. ‡New world record.
§New long-course record. || Wiggins' time of 54.4 sec. in Jan. 1956 was later approved as world record. ¶New U.S. citizens' record.

Table II.—National A.A.U. Women's Winners

(Indoors, Daytona Beach, Fla., April 5-7, 1956)

Event	Winner	Affiliation or city	Time
100-yd. free style	Wanda Werner	Walter Reed S.C.	
250-yd. free style	Dougie Gray	Washington, D.C.	58.6 sec.
500-yd. free style	Dougie Gray	Walter Reed S.C.	2 min. 45.4 sec.*†
100-yd. backstroke	Carin Cone	Walter Reed S.C.	5 min. 55.8 sec.*†
200-yd. backstroke	Carin Cone	Ridgewood, N.J.	1 min. 7.2 sec.
100-yd. butterfly	Shelley Mann	Ridgewood, N.J.	2 min. 26.4 sec.*†
200-yd. butterfly	Shelley Mann	Walter Reed S.C.	1 min. 4.1 sec.*†
100-yd. breast stroke	Mary Jane Sears	Walter Reed S.C.	2 min. 26.3 sec.*†
250-yd. breast stroke	Mary Jane Sears	Walter Reed S.C.	1 min. 12.2 sec.*†
400-yd. breast stroke	Mary Jane Sears	Walter Reed S.C.	3 min. 22.1 sec.*†
400-yd. free style	Sylvia Ruuska	Berkeley Y.M.C.A.	5 min. 14.9 sec.*†
400-yd. free-style relay	Team A (Lucy Crocker, Barbara Love, Helen Hughes, Joan Rosazza)	Lafayette S.C.	3 min. 56.8 sec.*††
400-yd. medley relay	Team A (Shelley Mann, Mary Jane Sears, Betty Brey, Wanda Werner)	Walter Reed S.C.	4 min. 27.4 sec.*††
1-m. diving	Ann Cooper	Los Angeles A.C.	481.35 pt.
3-m. diving	Barbara Gilders	Detroit A.C.	416.85 pt.
Team	Walter Reed S.C.		110 pt.
(Outdoors, Tyler, Tex., July 4-7, 1956)			
110-yd. free style	Wanda Werner	Walter Reed S.C.	1 min. 6.3 sec.†
440-yd. free style	Marley Shriver	Los Angeles A.C.	5 min. 13.8 sec.*†
880-yd. free style	Sylvia Ruuska	Berkeley Y.M.C.A.	10 min. 54.5 sec.*†
1,500-m. free style	Carolyn Green	Flt. Lauderdale (Fla.) S.A.	21 min. 30.2 sec.*†
110-yd. backstroke	Carin Cone	Ridgewood, N.J.	1 min. 14.5 sec.*†
220-yd. backstroke	Carin Cone	Ridgewood, N.J.	2 min. 43.8 sec.*†
110-yd. butterfly	Shelley Mann	Walter Reed S.C.	1 min. 11.8 sec.*††
220-yd. butterfly	Shelley Mann	Walter Reed S.C.	2 min. 44.4 sec.*††
220-yd. breast stroke	Mary Jane Sears	Walter Reed S.C.	2 min. 59.0 sec.*†
440-yd. medley	Shelley Mann	Walter Reed S.C.	5 min. 52.5 sec.*†
440-yd. medley relay	Team A (Shelley Mann, Mary Jane Sears, Betty Brey, Wanda Werner)	Walter Reed S.C.	5 min. 5.8 sec.
880-yd. relay	Team A (Shelley Mann, Betty Brey, M. Gillett, Wanda Werner)	Walter Reed S.C.	10 min. 9.8 sec.
1-m. diving	Pat McCormick	Los Angeles A.C.	481.30 pt.
3-m. diving	Pat McCormick	Los Angeles A.C.	446.60 pt.
Platform diving	Pat McCormick	Los Angeles A.C.	261.0 pt.
Team	Walter Reed S.C.		104 pt.

*New championship meet record. †New U.S. record. ††New world record.
 ‡New event. ‡‡Nancy Simons finished second in 110-yd. free style but set new meet and U.S. record of 1 min. 5.6 sec. in qualifying heat.

Table III.—National Collegiate A.A. Winners

(Indoors, New Haven, Conn., March 29-31, 1956)

Event	Winner	Affiliation	Time
50-yd. free style	Rex Aubrey	Yale	22.1 sec.*
100-yd. free style	Robin Moore	Stanford	49.3 sec.*
220-yd. free style	Al Kuhn	Northwestern	2 min. 4.7 sec.
440-yd. free style	Bill Woolsey	Indiana	4 min. 31.1 sec.
100-yd. backstroke	Lincoln Hurring	Indiana	58.1 sec.
200-yd. backstroke	Lincoln Hurring	Iowa	2 min. 7.5 sec.
200-yd. butterfly	Dick Fadgen	North Carolina State	2 min. 16.3 sec.
200-yd. breast stroke	Dick Fadgen	North Carolina State	2 min. 23.1 sec.
200-yd. medley	Al Wiggins	Ohio State	2 min. 7.5 sec.†
1,500-m. free style	George Breen	Cortland State Teachers	18 min. 5.9 sec.†
300-yd. medley relay	Yale (Bill Clinton, Dan Cornwall, Rex Aubrey)		2 min. 46.3 sec.
400-yd. free-style relay	Yale (Dan Cornwall, Joe Robinson, Dave Armstrong, Sandy Gideonse)		3 min. 23.1 sec.†
1-m. diving	Frank Fraunfelter	Ohio State	
3-m. diving	Don Harper	Ohio State	
Team	Ohio State		68 pt.

*Tied collegiate meet record. †New collegiate meet record. ‡New world record.

in 18 min. 5.9 sec., and established a one-mile free-style mark on April 5 at New Haven with a 19 min. 40.4 sec. performance. Yorzyk's record times were made at Winchendon, Mass., April 14 when he was clocked at 2 min. 16.7 sec. for the 200-m. butterfly and at 2 min. 18.7 sec. for the 220-yd. butterfly. Al Wiggins of Ohio State, on Jan. 1, set a world record of 54.4 sec. for the 100-yd. butterfly event. Other new records set in 1956 and approved by the International Amateur Swimming federation appear in Table V.

Murray Rose, an Australian, improved on Breen's clocking when he was timed at 17 min. 59.5 sec. for the 1,500 m. in Australia's Olympic

trials at Melbourne. A Russian quartet in the Soviet Union trials at Moscow on Aug. 14, 1956, won the 400-m. medley relay in 4 min. 14.8 sec. to surpass the world record of 4 min. 15.7 sec. set by a Japanese team in 1955.

Women's Events.—Among the many outstanding U.S. swimmers, with sights on the Olympic games, were Shelley Mann, Carin Cone, Sylvia Ruuska, Mary Jane Sears and Pat McCormick (diver). Lorraine Crapp, a 17-year-old Australian, set a world mark of 5 min. 5.9 sec. for the 440-yd. free style early in the campaign and improved on this time as the year pro-

Table IV.—U.S. Olympic Trials Winners

(Outdoors, Detroit, Mich., Aug. 7-10, 1956)

Event	Winners	Affiliation or city	Time
Men's division			
100-m. free style	William Woolsey	Hawaii	57 sec.*
200-m. free style	Ford Konno	Coca Cola S.C., Cincinnati, O.	2 min. 10.6 sec.
400-m. free style	George Breen	Buffalo A.C.	4 min. 33.1 sec.
1,500-m. free style	George Breen	Buffalo A.C.	18 min. 13.7 sec.†
100-m. backstroke	Yoshi Oyakawa	U.S. air force	1 min. 5.2 sec.
200-m. butterfly	Bill Yorzyk	New Haven S.C.	2 min. 19 sec.†
200-m. breast stroke	Bob Hughes	Club del Mar, Santa Monica, Calif.	2 min. 44.4 sec.†
3-m. diving	Don Harper	Ohio State	516.05 pt.
Platform diving	Gary Tobian	Los Angeles A.C.	174.87 pt.
Women's division			
100-m. free style	Nancy Simons	Chicago S.C.	1 min. 5.1 sec.†
200-m. free style	Sylvia Ruuska	Berkeley Y.M.C.A.	5 min. 10.0 sec.†
100-m. backstroke	Carin Cone	Ridgewood, N.J.	1 min. 15.0 sec.†
100-m. butterfly	Shelley Mann	Walter Reed S.C.	1 min. 12.3 sec.†
200-m. breast stroke	Mary Jane Sears	Walter Reed S.C.	2 min. 58.6 sec.†
3-m. diving	Pat McCormick	Los Angeles A.C.	464.10 pt.
10-m. diving	Pat McCormick	Los Angeles A.C.	284.35 pt.

*New world record. †New U.S. record. ‡Dick Fadgen finished second in 200-m. breast stroke but set new U.S. record of 2 min. 44 sec. in qualifying heat.

gressed. On Aug. 25, she bettered four world records, being clocked at 4 min. 50.8 sec. for the 400 m. and 4 min. 52.4 sec. for the 440 yd., bettering her own 440-yd. time and the 400-m. mark of 5 min. .1 sec. set by Denmark's Ragnild Hveger in 1940. She also surpassed Dawn Fraser's world figures of 2 min. 20.7 sec. for the 200 m. and 2 min. 21.2 sec. for the 220 yd. when she was timed at 2 min. 19.3 sec. and 2 min. 20.5 sec. respectively. Eighteen-year-old Dawn Fraser of Australia accounted for two new records on Aug. 25 as she won a 110-yd. free-style race. She swam the 100 m. in 1 min. 3.3 sec. after recording 56.9 sec. for the 100-yd. event. Miss Crapp set five records on Oct. 20: 440 yd. (4 min. 48.6 sec.); 200 m. (2 min. 18.5 sec.); 220 yd. (2 min. 19.1 sec.); 400 m. (4 min. 47.2 sec.) and the 110-yd. leg in relay race (1 min. 3.2 sec.). In the 440-yd. relay, Lorraine Crapp, Margaret Gibson, Barbara Jackson and Dawn Fraser won in 4 min. 22.3 sec.

Table V.—World Records Set in 1956, Approved June 2, 1956

Event	Name	Country	Place	Date	Performance
Men					
100-yd. free style	Rex Aubrey	Australia	New Haven, Conn.	March 10	49.0 sec.
100-yd. free style	Robin Moore	U.S.	Stanford, Conn.	May 19	48.9 sec.
880-yd. free style	Murray Rose	Australia	Sydney, Austr.	Jan. 18	9 min. 34.3 sec.
1,500-m. free style	George Breen	U.S.	New Haven, Conn.	March 29	18 min. 5.9 sec.
1,760-yd. free style	George Breen	U.S.	New Haven, Conn.	April 5	19 min. 40.4 sec.
100-yd. butterfly	Al Wiggins, Jr.	U.S.	Columbus, O.	Jan. 21	54.5 sec.
200-m. butterfly	J. Nagasawa	Japan	New Haven, Conn.	March 14	2 min. 19.3 sec.
200-m. butterfly	Bill Yorzyk	U.S.	Winchendon, Mass.	April 14	2 min. 16.7 sec.
220-yd. butterfly	J. Nagasawa	Japan	New Haven, Conn.	March 14	2 min. 20.3 sec.
220-yd. butterfly	J. Nagasawa	Japan	New York, N.Y.	March 23	2 min. 20.1 sec.
220-yd. butterfly	J. Nagasawa	Japan	New Haven, Conn.	April 6	2 min. 19.4 sec.
220-yd. butterfly	Bill Yorzyk	U.S.	Winchendon, Mass.	April 14	2 min. 18.7 sec.
400-yd. medley relay	North Carolina A.C. (W. Sonner, J. Nelson, R. Fadgen, D. McIntyre)	U.S.	New Haven, Conn.	April 7	3 min. 46.0 sec.
Women					
100-m. free style	Dawn Fraser	Australia	Sydney, Austr.	Feb. 21	1 min. 4.5 sec.
100-m. free style	C. Gastelaars	Netherlands	Amsterdam, Neth.	March 3	1 min. 4.2 sec.
100-m. free style	C. Gastelaars	Netherlands	Schiedam, Neth.	April 14	1 min. 4.0 sec.
200-m. free style	Dawn Fraser	Australia	Sydney, Austr.	Feb. 25	2 min. 20.7 sec.
220-yd. free style	Dawn Fraser	Australia	Sydney, Austr.	Feb. 25	2 min. 21.2 sec.
440-yd. free style	Lorraine Crapp	Australia	Sydney, Austr.	Jan. 7	5 min. 7.0 sec.
440-yd. free style	Lorraine Crapp	Australia	Sydney, Austr.	Feb. 17	5 min. 6.7 sec.
440-yd. free style	Lorraine Crapp	Australia	Sydney, Austr.	Feb. 18	5 min. 5.9 sec.
440-yd. free style	Lorraine Crapp	Australia	Sydney, Austr.	Jan. 14	10 min. 30.9 sec.
800-m. free style	Lorraine Crapp	Australia	Sydney, Austr.	Jan. 14	10 min. 34.6 sec.
800-yd. free style	Lorraine Crapp	Australia	Sydney, Austr.	Jan. 14	10 min. 34.6 sec.
100-yd. breast stroke	Mary Jane Sears	U.S.	Daytona Beach, Fla.	April 6	1 min. 13.0 sec.
100-yd. butterfly	Shelley Mann	U.S.	Daytona Beach, Fla.	April 7	1 min. 4.1 sec.
100-m. butterfly	A. Voorbij	Netherlands	Velsen, Neth.	Feb. 5	1 min. 11.9 sec.
400-yd. free-style relay	Lafayette S.C. (J. Rosazza, L. Crocker, B. Love, H. Hughes)	U.S.	Daytona Beach, Fla.	April 6	3 min. 56.8 sec.
400-yd. medley relay	Walter Reed S.C. (S. Mann, M. J. Sears, B. Mullen, W. Werner)	U.S.	Detroit, Mich.	March 3	4 min. 23.0 sec.

Intercollegiate Meets.—A world-record performance by Breen featured the National Collegiate Athletic association (N.C.A.A.) championships held at Yale in New Haven, Conn., when he was clocked at 18 min. 5.9 sec. for the 1,500-m. free style. Ohio State won team laurels with 68 points. Other N.C.A.A. victors are listed in Table III. Robin Moore, in winning the 100-yd. free style in 48.9 sec., helped Stanford win the Pacific Coast conference title for the eighth straight season. Other leading college team champions were: Yale, Ivy league; Ohio State, Big Ten; Oklahoma, Big Seven; North Carolina State and North Carolina (tied), Atlantic coast; Beloit (Wis.), Central Collegiate; Pittsburgh (Pa.), Eastern Collegiate; North Central (Naperville, Ill.), Illinois conference; Catholic university, Mason-Dixon; New York university, Metropolitan; Bowling Green (O.), Mid-American; Grinnell (Ia.), Mid-West; Denver (Colo.), Mountain States; Florida, Southeastern; Virginia Military institute, Southern; Texas A. and M., Southwest.

(See also OLYMPIC GAMES.)

(T. V. H.)

Switzerland.

A republican confederation of 22 cantons (three of which have half-cantons) in west central Europe, Switzerland is bounded west by France, north by Germany, east by Austria and Liechtenstein and south by Italy. Area: 15,941 sq.mi. Pop. (1950 census) 4,714,992; (1956 est.) 5,001,000. Language (1950): German 72.1%; French 20.3%; Italian 5.9%; Romansh 1.0%. Religion (1950): Protestant 56.3%; Roman Catholic 41.6%; Jewish 0.4%; other 1.6%. Chief towns (pop., 1950 census, 1952 est. in parentheses): Berne (cap.) 146,499 (150,600); Zürich 390,020 (400,300); Basle 183,543 (187,800); Geneva 145,473 (151,400); Lausanne 106,807 (109,000). President of the confederation for 1957, Hans Streuli; vice-president of the federal council (government), Thomas Holenstein.

History.—The prosperity of Switzerland in 1956 broke all previous records; its foreign trade increased steadily, especially with the German Federal Republic. The dangers of inflation were fairly successfully combatted, but a rise in the price of milk and related products on May 1 was followed by other increases. The trade union leaders had long before abandoned the strike weapon in favour of negotiation. In October, however, they refused to meet the employers to discuss the price and wage situation; instead they asked for shorter hours for the same pay.

Meanwhile a slight reduction of taxation had become operative at the beginning of the year and, apart from bigger cost-of-living bonuses, the salaries of all civil servants went up by 5%, and by more than this for the least well paid; even so, and after repayment of a considerable portion of the national debt, the budget surpluses were not used up.

Foreign undertakings were eager to borrow from the capital which was accumulating in Switzerland. Thus in June the Swiss government provided a 200,000,000 Fr. credit to the Italian state railways. On Sept. 18 it was announced that Switzerland would lend a further 200,000,000 Fr. to the International Bank for Reconstruction and Development at 3½% interest a year, the loan to be repaid between 1960 and 1965. Proceeds in Swiss francs from the loan were to be used to buy dollars from the Swiss National bank in order to prevent any increase in the circulation of Swiss franc notes.

Samuel Chevallier continued to enjoy the limelight. Early in 1956 he drew up two fresh "initiatives": (1) should the government intend to spend more than 500,000,000 Fr. upon the armed forces in any one year (for 1956 the figure was 673,000,000 Fr.), popular approval by referendum must be made necessary; (2) at least one-tenth of annual military expenditure should always be spent upon social aid or cultural work, half of this tenth being spent abroad. At first Chevallier seemed to be fairly well sup-

ported, particularly in his own Vaud canton; many young French Swiss were seemingly embarrassed by their own prosperity and simultaneously irritated when called up to undergo military discipline for brief periods. The "initiatives" were handed in to the authorities on Oct. 17, the first having received 84,716 signatures and the second 68,402; this time there seemed no doubt that they would be voted upon. But they were withdrawn on Nov. 18, by which time the Soviet reaction to the Hungarian uprising had caused a violent swing of Swiss opinion away from pacifism.

In the spring of 1956 the Swiss were largely absorbed with discussion of whether further state aid should be provided to the Holzverzuckerung A.G. or "Hovag." This was a concern in the canton of Graubünden (Grisons) which had been heavily subsidized during World War II for extracting alcohol (for internal combustion engines) and other chemical substances from wood. The subsidies had indeed been continued for ten years after the end of the war, and their prolongation for a further five years was approved by the Swiss chambers in Sept. 1955. This led to something of an uproar since the Hovag, while claiming to be in grave financial difficulty, was making no serious effort to convert its production to peacetime needs, but was founding daughter concerns which were eminently flourishing. On May 13, 1956, 315,704 Swiss citizens, affected by the talk of the dependence of a poor canton like Graubünden upon the Hovag factories, voted in favour of continued aid while 429,314 pronounced against it. The Hovag, after some reorganization, appeared by the end of 1956 to be running quite successfully without aid.

Some controversy was aroused by an agreement signed with the United States on June 21, 1956, according to which Switzerland was to buy 500 kg. of uranium 235 from the United States, with certain rights of supervision for the Americans which were claimed by some critics to involve an infringement of Swiss neutrality.

On Nov. 6 the Swiss government sent an urgent appeal to the president of the United States and the heads of government of France, Great Britain, the U.S.S.R. and India. It proposed that an immediate conference of the five powers should be held in Switzerland to deal with the deteriorating international situation; but the powers concerned refused.

(E. Wl.)

Education.—Schools (1953–54): primary, pupils 518,050, teachers 15,204; secondary and lower middle, pupils 85,477, teachers 3,442; vocational (1951, excluding agriculture) 89, pupils 21,112. Institutions of higher education (1954–55) 9, students 15,622, teaching staff 1,954.

Finance and Banking.—Monetary unit: Swiss franc, with an exchange rate of 4.28 Fr. to the U.S. dollar. Budget: (1955 est.) revenue 1,906,566,000 Fr., expenditure 1,875,240,000 Fr.; (1956 est.) revenue 2,432,463,000 Fr., expenditure 1,968,832,000 Fr. Public debt (Dec. 1954): 7,772,700,000 Fr. Currency circulation: (Dec. 1954) 5,830,000,000 Fr., (Dec. 1955) 5,940,000,000 Fr. Deposit money: (Dec. 1954) 7,368,000,000 Fr., (Dec. 1955) 7,690,000,000 Fr. Gold and foreign exchange holdings: (March 1955) U.S. \$1,628,000,000, (March 1956) U.S. \$1,744,000,000.

Foreign Trade.—(1955) Imports 6,397,000,000 Fr., exports 5,616,000,000 Fr. Main sources of imports: Germany 24%; France 13%; other continental E.P.U. (European Payments union countries) 24%; U.S. and Canada 15%; Latin America 5%; U.K. 5%. Main destinations of exports: U.S. and Canada 13%; Germany 13%; Italy 8%; other continental E.P.U. 26%; Latin America 9%; sterling area 13%.

Transport and Communications.—Roads (1953): 49,000 km. Motor vehicles in use (Sept. 1955): passenger 270,821, commercial 57,069. Railways (1955) 7,900 km.; passenger-km. (1955) 6,954,000,000; freight, ton-km. (1955, federal system only) 2,868,000,000. Shipping (July 1955): merchant vessels of 100 gross tons and over 29; total tonnage 95,061. Air transport (1955): passenger-km. 515,652,000; cargo, ton-km. 12,458,400. Telephones (Jan. 1955) 1,141,443. Radio receiving sets (1954) 1,198,000.

Agriculture.—Main crops (metric tons, 1955; 1954 in parentheses): wheat 331,000 (346,000); rye 42,000 (45,000); barley 55,000 (62,000); oats 54,000 (66,000); potatoes 1,100,000 (1,395,000); apples (1954) 620,000, (1953) 340,000; pears (1954) 220,000, (1953) 270,000. Food production (metric tons, 1955): meat 80,400 (in 43 towns only and including horse meat); milk (delivered) 1,932,000; butter 25,200; cheese 56,400; beet sugar, raw, 28,000. Livestock (Sept. 1955): cattle 1,583,000; sheep 195,000; pigs 1,038,000; horses 120,000; goats (1951) 148,244.

Industry.—Production: electricity (excluding industrial generation, 1955): 13,068,000,000 kw.hr.; manufactured gas (1954) 323,000,000 cu.m.; cement (1954) 1,817,000 metric tons. Watches: exports (1954) 22,294,000; value, including parts (1954) 1,039,915,622 Fr. Index of employment (March 1956; 1953=100) 108.

ENCYCLOPÆDIA BRITANNICA FILMS.—Switzerland (1955).

Symphony Orchestras: see MUSIC.

Synthetic Products: see CHEMISTRY; PLASTICS; RUBBER; TEXTILE INDUSTRY.

Syphilis: see VENEREAL DISEASES.

Syria. This Arab republic is bounded west by the Mediterranean and Lebanon, northwest and north by Turkey, east and southeast by Iraq, south by Jordan and southwest by Israel. Area: 71,227 sq.mi. Pop. (1955 est.) 3,906,000. Language: Arabic (86%); also Kurdish, Armenian, Turkish, Circassian. Religion (1954 est.): Moslems (mainly Sunni) 86.3%; Christian 12.8%. Chief towns (pop., 1954 est.): Damascus (cap.) 395,124; Aleppo 398,461; Homs 293,643; Hama 172,988; Latakia 109,216. President in 1956, Shukri el-Kuwatli. Prime ministers in 1956: Said el-Ghazzi, and (from June 15) Sabri el-Assali.

History.—Syria continued to pursue its policy of close co-operation with Egypt and Saudi Arabia. In March President Kuwatli met Col. Gamal Nasser and King Saud in Cairo, and in September a meeting of the three heads of state took place at Riyadh in Saudi Arabia, although on this occasion there were grounds for believing that the president and the king, while still proclaiming their complete support for Egypt, impressed on Nasser the need for moderation in view of the danger to Arab oil interests that might arise from a conflict with the west.

In June the government of Said el-Ghazzi resigned after a long period of political uncertainty, and after some confusion was succeeded by a national coalition under Sabri el Assali, who had been in power before el-Ghazzi in the previous year. The new government adopted as the basis of its policy a national charter, drawn up by the various political parties, the main points of which were: Arab unity, neutrality between the west and the communist powers, the rejection of foreign pacts, but readiness to accept arms from any source "without strings." The dismissal earlier in the year of Brigadier Shawkat Shoukair from his post as chief of staff represented an attempt to eliminate army influence from politics, still surviving from the previous regime.

The year was characterized by much military activity and public interest in military preparations following the Israeli attack on a Syrian frontier post in 1955. These preparations included the raising of funds, both inside and outside Syria, in aid of the army; the strengthening of the country's defenses, the building of air-raid shelters and the introduction of military training in secondary and trade schools.

The tenth anniversary of the evacuation of French troops was celebrated with a military parade of unusual éclat at which all the Arab states were represented, with the notable exception of Lebanon.

The Syrian government decided not to accept outright either the U.S. or the Soviet offer to build the Homs oil refinery (with a capacity of 750,000 to 1,000,000 tons a year) but to invite tenders. These were received from the United States, the United Kingdom, the U.S.S.R., Czechoslovakia and Rumania, but no adjudication was immediately made.

Syria's biggest scheme of economic development, the Ghab project, continued to make progress. The objects of this scheme were to drain the swamps of the Orontes valley, reclaim land for cultivation, provide water for irrigating 200,000 ac. as well as hydroelectric power for industry, exterminate disease-bearing insects and improve communications in the area. The scheme was to cost £10,000,000 and the annual yield of the land reclaimed was expected to be about 435,000 tons of agricultural crops.

On Oct. 30, following the advance of the Israeli army into Egyptian territory, martial law was proclaimed throughout Syria, and as a riposte to the Anglo-French military action against Egypt in November a Syrian Army unit blew up the Iraq Petro-

leum company's pipelines in Syrian territory. Relations between Syria and Iraq in consequence became extremely strained.

(E. S. AH.)

Education.—Schools (1953-54): primary 2,584, pupils 319,438, teachers 9,660; secondary 212, pupils 54,040, teachers 3,691; vocational 12, pupils 1,976, teachers 244; teacher training colleges 6, students 1,226. University of Damascus (1953-54): students 2,960, teaching staff (1952) 107.

Finance and Trade.—Monetary unit: Syrian pound, with an official exchange rate of L.S. 2.2 and a free rate of L.S. 3.55 to the U.S. dollar. Budget (1955 est.) balanced at L.S. 261,000,000; (1956 est.) balanced at L.S. 324,000,000. Currency circulation: (Dec. 1953) L.S. 288,432,000; (Dec. 1954) L.S. 366,750,000. Deposit money: (Dec. 1953) L.S. 292,748,000; (Dec. 1954) L.S. 334,849,000. Gold and foreign exchange: (Dec. 1953) L.S. 77,200,000; (Dec. 1952) L.S. 49,200,000. Foreign trade (1955): imports L.S. 647,000,000; exports L.S. 532,000,000.

Transport and Communications.—Roads (1953) 10,016 km. of which 2,424 km. asphalted. Motor vehicles in use (Jan. 1954): passenger 8,351; commercial 6,674. Railways (1955) 900 km. Telephones (Jan. 1955) 29,836. Radio receiving sets (1950) 45,000.

Agriculture.—Production (metric tons, 1954; 1955 in parentheses): wheat 965,000 (500,000); barley 635,000 (150,000); oranges, etc., 3,000 (2,000); cotton lint 80,000 (85,000); (1954): rice 25,000; cottonseed 141,000; lentils 58,000; sesame 14,200; olive oil 8,000; apricots 25,000; grapes 257,000; raisins 10,000; figs 56,000; lemons, etc., 1,000. Livestock (Sept. 1955): cattle 552,000; sheep 3,955,000; horses 103,000; mules 84,000; asses 271,000; goats (1951) 1,433,000.

Industry.—Production (metric tons, 1955): cement 264,000; electricity 146,040,000 kw.hr.; cotton yarn (1953) 6,600; rayon yarn (1953) 1,200.

Table Tennis. The 23rd world championships in table tennis were held in Tokyo, Japan, April 2-11, 1956. Stockholm, Swed., was selected for the next world meeting.

In the 1956 event, there was no change from the previous year in the world team championships, Japan and Rumania retaining the Swaythling and Corbillon cups, respectively. The winner of the men's singles was Ichiro Ogimura of Japan; women's singles, Tomi Okawa, Japan; men's doubles, Ichiro Ogimura and Yoshio Tomita, Japan; women's doubles, Angelica Rozeanu and Ella Zeller, Rumania; mixed doubles, Erwin Klein, Los Angeles, Calif., and Mrs. Leah Neuberger, New York, N.Y.; Jubilee cup, J. D'antas, Portugal.

In the U.S. National open championships, held at White Plains, N.Y., March 16-18, the winners were: men's singles, Erwin Klein, Los Angeles, Calif.; women's singles, Mrs. Leah Neuberger, New York, N.Y.; senior men's singles, Laszlo Bellak, Miami, Fla.; esquire singles, Bill Gunn, Mamaroneck, N.Y.; junior men's singles, Erwin Klein; junior miss' singles, Sharlene Krizman, South Bend, Ind.; boys' singles, Norbert Van De Walle, Chicago, Ill.; girls' singles, Jackie Koehnke, Glen Ellyn, Ill.; mixed doubles, Sol Schiff and Mrs. Leah Neuberger, New York, N.Y.; men's doubles, Erwin Klein, Los Angeles, and Richard Bergmann,



WOMEN'S DOUBLES MATCH at world table tennis championship tournament in Tokyo, Japan, in April 1956. Japanese team (near side of table) defeated U.S. girls, 21-18 and 21-12

London; women's doubles, Mrs. Leah Neuberger and Mildred Shahian; senior men's doubles, Laszlo Bellak, Miami, Fla., and Tibor Hazi, Chevy Chase, Md.; junior men's doubles, Roger Desormeaux and Denis Limoges, Montreal, Can.; junior mixed doubles, John Kromkowski and Sharlene Krizman, South Bend, Ind.

The Canadian international table tennis championships were held Sept. 8–10, 1955. In the men's team event Canada beat the United States 6 to 4, but the U.S. junior men's team beat Canada's junior team 3 to 1. Other winners were: men's singles, Erwin Klein, Los Angeles; women's singles, Mrs. Leah Neuberger, New York city; junior men's singles, Erwin Klein; junior miss' singles, Carolee Leichty, South Bend, Ind.; boys' singles, Norbert Van De Walle, Chicago; senior men's singles, Max Markinko, Canada; mixed doubles, Charles Burns and Mrs. Leah Neuberger, New York city; women's doubles, Mrs. Leah Neuberger and Lona Flam, New York city.

In the English open championships, held at Belle Vue, Manchester, February 28–March 2, 1956, the men's singles crown was won by Elemer Gyetvai, Hungary; women's singles, Gizi Farkas, Hungary; men's doubles, Elemer Gyetvai and Kalman Szepesi, Hungary; women's doubles, Diane Rowe and Ann Haydon, England; mixed doubles, Johnny Leach and Diane Rowe, England; boys' singles, I. Harrison, Gloucester; girls' singles, Ann Haydon, Warwickshire; boys' doubles, I. Harrison and K. Edwards, Warwickshire; girls' doubles, Ann Haydon and Miss Worrall, Warwickshire; junior mixed doubles, L. Landry and Ann Haydon; veteran singles, H. Spears, Warwickshire; veteran women's singles, Mrs. G. Davies, Lancashire.

Winners in the U.S.S.R. closed championships held in March 1956 at Leningrad were: men's singles, A. Saumoris, Lithuania; women's singles, E. Lestal, Estonia; mixed doubles, A. Saumoris and B. Balaisjene, Lithuania; men's doubles, A. Saumoris and Baltakis; women's doubles, B. Balaisjene and O. Zileviciute, Lithuania. (P. W. R.)

Taiwan: see FORMOSA.

Tanganyika: see BRITISH EAST AFRICA; TRUST TERRITORIES.

Tangerines: see FRUIT.

Tangier. From 1912 an international and demilitarized zone of Morocco, on the south side of the Straits of Gibraltar, Tangier is controlled by Belgium, France, Great Britain, Italy, the Netherlands, Portugal, Spain and the United States, under the nominal sovereignty of the sultan of Morocco. Area: 135 sq.mi. Pop.: (1955 est.) 183,000, including 15,000 Moroccan Jews and 42,000 Europeans (35,000 Spaniards, 6,000 French, 1,000 others). Languages: Arabic, French and Spanish. Religion: mainly Moslem. Pop. of Tangier city: (1953 est.) 162,110. Administrator (post suppressed on July 5, 1956), Robert van de Kerchove d'Hallebast (Belgium). Sultan's representative (mendub), Haj Mohammed el-Tazi (resigned July 8). Moroccan governor, Abdullah Ghenun.

History.—As a consequence of the recognition of Morocco's independence and sovereignty the statute of Tangier had to be revised. On April 28, 1956, Haj Mekki Benani, a Moroccan member of the Tangier legislative assembly, requested the immediate opening of negotiations for a new statute within an independent and sovereign Morocco.

The British and U.S. governments, when recognizing Morocco's independence, expressed the hope that the Moroccan government would agree that it would be generally advantageous to preserve some of the international facilities for goods in transit and favourable currency regulations.

At the invitation of Ahmed Balafrej, the Moroccan foreign minister, members of the Tangier committee of control flew to

Rabat on July 5 and attended a meeting presided over by M'Barek ben Mustafa el-Bekai, the premier. A protocol was signed to take effect until the final outcome of negotiations on the incorporation of the zone in the Sherifian empire. The post of administrator, however, was suppressed.

On Oct. 8, the nine-power conference on the future of Tangier was opened formally at Fedala, near Casablanca. Besides Morocco, the eight administering powers were represented. Sultan Mohammed V ben Yusuf told the delegates of the eight powers that he was only consulting them about the means of safeguarding the national and foreign economic interests that had been developed in Tangier. The real work of the conference started two days later in Tangier. It ended on Oct. 29 by a signature of an eight-power declaration and of a protocol, the last-named signed also by Ahmed Balafrej.

The declaration stated that the Tangier international regime was abolished and that the Moroccan government was to take possession of public and private property formerly administered by the international committee of control. The protocol, to come into force on Jan. 1, 1957, stipulated that all existing laws would remain in force unless modified or cancelled by the Moroccan government.

Economy.—Currency equivalent to metropolitan franc (350 fr.=U.S. \$1). Budget (1954 est.): revenue 2,130,000,000 fr.; expenditure (ordinary) 1,600,000,000 fr., (extraordinary) 413,000,000 fr. Foreign trade (1954): imports 9,579,000,000 fr.; exports 996,000,000 fr. Shipping handled in the port of Tangier (1952): ocean-going ships entered 382 (546,000 gross tons), coasters entered 2,786 (1,555,000 gross tons). Roads (1954) about 104 km. Telephones (Jan. 1955) 10,376.

Tariffs. The general stability of the tariff structure of the world that had prevailed during several preceding years was again noted in 1956. Probably the most significant changes during the year involved additions to the many postwar projects undertaken to modernize the nomenclature of individual import tariffs and to adjust rates of duty to compensate for the general increase of world prices (or, at times, to adjust for more dramatic price increases in individual countries). There was no discernible tendency for countries generally to move toward, or away from, protectionism, or to make greater, or less, use of the tariff as an instrument of commercial policy. Increased interest was manifest during the year in the establishment of customs unions. Activities under the General Agreement on Tariffs and Trade (G.A.T.T.) were confined largely to routine holding operations, although some further achievements were made toward the general objective of liberalizing world trade.

General Tariff Revisions.—During the decade 1946–55, 25 countries made comprehensive revisions of their import tariffs. These comprehensive changes generally resulted in one or both of the following: (1) the adoption of a new tariff nomenclature, and (2) provision for a new schedule of import duties. During 1956, two countries, France and Iraq, completed general tariff revisions, and at least eight others—Austria, Germany, Sweden, Brazil, Mexico, Panamá, the Philippines and New Zealand—had projects for such revisions in various stages of completion.

More than half of the 25 countries used, for their tariff classification, the so-called Brussels nomenclature; *i.e.*, the tariff nomenclature sponsored by the Customs Cooperation council (formerly the European customs union study group), which had its headquarters at Brussels. In a protocol, signed July 1, 1955, the 13 members of the Customs Cooperation council agreed to adopt for their individual import tariffs the main headings of the Brussels nomenclature. Various of the member countries had already taken preliminary steps toward this end. On Jan. 1, 1956, the French government became the first member of the council to put into force a new tariff nomenclature conforming fully to the agreed classification.

Comprehensive tariff revisions, involving extensive changes

of both tariff nomenclatures and schedules of import duties, were either completed or nearing completion in Brazil, the Philippines and Iraq. The new tariffs in Brazil and the Philippines were submitted for congressional approval during 1956, but had not gone into effect by the close of the year. The Iraqi tariff became effective on Jan. 1, 1956. All three countries used the Brussels nomenclature as a basis for new tariff commodity classifications. As had occurred frequently in recent years, the projected tariffs in both Brazil and the Philippines made wide-scale use of ad valorem duties in lieu of specific-type duties previously in force. Reports indicated that the new Brazilian rates of duty, when applicable, would afford considerably added tariff protection to domestic industries. The revised Philippine tariff was also reported as providing additional protection for domestic industries but, apparently, the increases would be less extensive than those in Brazil. The new tariff in Iraq provided for numerous decreases in duty for various foodstuffs, machinery items and essential raw materials. Nevertheless, additional protection was granted by that country to selected domestic manufacturing industries.

In Central America, Mexico, in addition to three countries that had done so in earlier years, revised its tariff classification to conform with the N.A.U.C.A. (*Nomenclatura Arancelaria Uniforme Centroamericano*) nomenclature which had been developed by the Central American countries in anticipation of a possible economic union in that area. During the year the New Zealand government announced that it would undertake a review of its import tariff to modernize its nomenclature and to revise its schedule of duties.

Less Extensive Modifications.—During 1956 various countries made across-the-board adjustments of their tariff schedules that resulted in increased duties on virtually all their imports. Among the countries effecting such changes were Bolivia, Chile, the Dominican Republic, Ecuador, Egypt, Ireland, Sweden, Syria and the Philippines. In all of these instances, the tariff increases were, for the most part, moderate; and were designed primarily (1) to adjust specific-type duties for changes that had occurred in the general level of prices, (2) to raise additional revenue, or (3) in at least one instance, to improve the balance-of-payments situation of the country.

In Bolivia, the "currency devaluation surcharges," which had been employed to adjust for the disparity between the free-market rate of exchange and the official rate (applicable to all import purchases) were increased for most items. A similar adjustment was made in Chile, where customs duties are stated in terms of gold pesos no longer serving as the national medium of exchange but are paid in paper pesos; during the year, the Chilean "customs coefficient" (used to adjust for the depreciating value of the paper peso) was increased consecutively from 4900 to 1, to 6400 to 1, to 6450 to 1 and later to 9760 to 1. In the Dominican Republic, a special surcharge that was levied on virtually all import duties was increased from 3% to 5% of the basic duties. In Ecuador all imports became subject to an additional ad valorem duty of 0.75%, making imports subject to ad valorem as well as specific duties. Early in 1956, the Republic of Ireland imposed surcharges of either 3½% or 60% ad valorem on about 150 "nonessential" import items, with a view to reducing the volume of such imports and thereby improving the country's balance-of-payments position. Late in the year, Sweden imposed special import levies as part of a system for supporting farm prices and for maintaining farm incomes at parity with urban incomes. It was announced that the new import levies would be raised or lowered more or less automatically as agricultural prices fell below, or rose above, the designated parity level. Both Egypt and Syria increased duties on all imports by means of a uniform surtax levied to obtain additional revenue for the national treasury. One of the most important changes increasing a

country's tariff during 1956 was that made by the Republic of the Philippines; in January, duties on nearly 80 items became subject to increases ranging from 50% to 10 times higher than the rates previously in effect, and virtually all other import duties were increased by 30%.

Several other countries, including Israel, Lebanon, Nigeria and Thailand, increased import duties on a substantial number of items—though not on an across-the-board basis. Moreover, as was usually the case in earlier years, a quite substantial number of countries made piece-meal changes in their tariffs affecting selected import items. Changes of this character appear to have been made somewhat less frequently in 1956 than in immediately preceding years.

Piece-meal decreases in duty by individual countries appear to have been made during 1956 by about as many countries, and they affected about as many individual import items, as did the afore-mentioned piece-meal increases. Many of such decreases were "protective" in character, in that they were designed to assist domestic industries in obtaining essential supplies. In various countries, duties on items important in the cost of living, or essential to agricultural production (e.g., insecticides and fertilizers), were temporarily suspended or lowered.

The most extensive decreases in duty by an individual country during 1956 were those by the German Federal Republic; by a series of decrees during the year, the government reduced duties on many items in its tariff. Early in the year, primarily in order to reduce prices of items important in the cost of living, duties on about 120 categories of imports were temporarily reduced, on the average, to about four-fifths their former level. In addition, duties on about 100 agricultural and manufactured products were reduced by somewhat equivalent margins.

The General Agreement on Tariffs and Trade.—Activities of the General Agreement on Tariffs and Trade in 1956 involved principally the fourth round of tariff negotiations sponsored by the G.A.T.T. members and the 11th session of the contracting parties to G.A.T.T. During the year, the G.A.T.T. membership made little progress toward the establishment of the Organization for Trade Cooperation (O.T.C.)—designed to be the official administrative agency for G.A.T.T. Under the provisions of the projected organization, the O.T.C. could not enter into force until the United States accepted it. Although legislation authorizing United States acceptance was reported favourably by the house committee on ways and means, the congress did not take further action. Most other G.A.T.T. members also delayed acceptance of the O.T.C., apparently awaiting action by the United States.

Tariff Negotiations Under G.A.T.T.—From January to May 1956, the contracting parties, meeting at Geneva, held their fourth general round of tariff negotiations. In contrast to actions at previous tariff conferences sponsored by the G.A.T.T. members, no countries at this time negotiated for accession to the General agreement. Twenty-two of the 35 G.A.T.T. members participated in the 1956 negotiations: Australia, Austria, Belgium, Canada, Chile, Cuba, Denmark, the Dominican Republic, Finland, France, the German Federal Republic, Haiti, Italy, Japan, Luxembourg, the Netherlands, Norway, Peru, Sweden, Turkey, the United Kingdom and the United States. In addition, the High Authority of the European Coal and Steel Community (E.C.S.C.), participating for the first time, negotiated with various members for concessions on certain iron and steel products in exchange for concessions by three of the community's members: France, German Federal Republic and Italy.

The 22 participating countries and the High Authority of the E.C.S.C. concluded about 80 pairs of bilateral negotiations at Geneva. In view of the fact that most of the individual import items involved in such negotiations were already subject to con-

cessions in G.A.T.T., the new negotiations made little change in the estimated 60,000 items covered by concessions in the General agreement. The United States completed negotiations with each of the 21 other participating countries; by legislative authority, its concessions on individual items were generally limited to a maximum reduction of 5% in each of three successive years. Although other participating countries were not similarly limited in the concessions they could offer, the tariff reductions granted at the conference tended to be of modest proportions. By the end of September, Cuba, Haiti and Italy had placed their concessions in effect, and the United States had made effective the first stage of its concessions.

During 1955 and the first half of 1956, 21 of the 35 G.A.T.T. members renegotiated certain individual tariff concessions they had previously granted in the General agreement; generally, this course was pursued to permit them to impose increased restrictions on imports of the items involved. Italy, India, the Netherlands, Sweden and the United States renegotiated only one or two items from their schedule of G.A.T.T. concessions; Cuba, Greece and Peru renegotiated a substantial number of the concessions they had granted. As envisaged in the G.A.T.T. procedures, the members concluding such renegotiations granted compensatory concessions to countries having a principal trade interest in the renegotiated items.

Customs Unions.—The most ambitious proposal for a common market under consideration during the year became known as Euromarket. This project, one of several that had been proposed in postwar years for European integration, was sponsored by the council of ministers of the European Coal and Steel Community (Schuman plan). Being dissatisfied with the limited results that had been achieved through other projects (*e.g.*, Customs Cooperation council, Western European union, European Movement, etc.) and believing that effective European cooperation might best be obtained by working through established institutions, the council of ministers decided to seek European integration through the membership, and using the model, of the Coal and Steel Community. As that organization had already established a common market for coal and steel, the ministers proposed to establish a similar community of states which would eventually provide a common European market for other commodities. To that end, the Brussels Intergovernmental Community on European Integration was created. The membership of the committee consisted of representatives of the countries already belonging to the Coal and Steel Community. The projected Euromarket, when established, would provide a common market for all European states willing to affiliate therewith; import-export licences, quotas and tariffs would be eliminated within the community and a common tariff would be established for the products of third countries.

During 1956, the Scandinavian countries proceeded with their project to establish a Nordic customs union. During the year, the Nordic council studied proposals whereby a common Nordic market would be achieved. It was envisioned that, over a period of years, a complete customs union would be established by gradually expanding the number of items of trade covered—ultimately eliminating all trade restrictions between the member states and creating a common tariff on imports from without the free-trade area.

The Central American states moved closer to a type of economic integration which, among other things, would establish a customs union in that area. By the close of the year, four countries—Costa Rica, Honduras, Mexico and Nicaragua—had adapted their import tariffs to the N.A.U.C.A. nomenclature, and the ministers of economy of the five Central American countries had created a permanent secretariat with instructions to: (1) devise a common tariff for the area based on the

N.A.U.C.A. classification, and (2) propose measures to create a free-trade area for designated merchandise. Closely related to this project were various bilateral agreements concluded by individual pairs of Central American countries. In Dec. 1955, Costa Rica and Guatemala negotiated a treaty providing for free trade between the two countries on a substantial list of items, as well as for limited free trade for many other products and reduced import duties on still others. By the close of the year, El Salvador had negotiated similar treaties with all Central American states, the general objective being to lay the basis for a more inclusive multilateral agreement.

United States Tariff Policy.—During 1956, the United States, on balance, eased somewhat its import tariff restrictions. Although new import restrictions were imposed on some items, a considerable number of U.S. import duties were reduced through the afore-mentioned G.A.T.T. negotiations. Such changes, however, did not alter materially the prevailing level of duties. By congressional action, the United States revised its procedures for determining the dutiable value of imported articles.

Import Restrictions.—Either unilaterally or through negotiation with foreign countries, a few U.S. import duties were increased during the year. On recommendation of the tariff commission after an escape-clause investigation, Pres. Dwight D. Eisenhower withdrew a concession that had been granted in G.A.T.T. on linen towelling, and increased the duty on imports of that product. In two other escape-clause reports (relating to acid-grade fluorspar and para-aminosalicylic acid), the tariff commission divided equally (3-3) on whether escape action should be taken; the president, however, decided not to increase the import duties on either of those products. At the G.A.T.T. tariff negotiations held early in the year, the United States, under article 28 of the General agreement, negotiated increases in its concessions on liquid sugar and certain fur-felt hats. Late in September, the president invoked the Geneva wool-fabric reservation, whereby the United States, in granting a concession on woollens and worsteds at Geneva in 1947, had reserved the right to increase the duty on any imports of such fabrics in excess of 5% of United States production thereof.

During 1956, several attempts in congress to impose import quotas on Japanese cotton textiles or to direct the tariff commission to conduct escape-clause investigations of all cotton textiles were ultimately defeated, some by narrow margins. On application of domestic producers, however, the tariff commission instituted four escape-clause investigations of cotton textile products that were being imported predominantly from Japan. In an attempt to lessen the mounting demands in the United States for rigid import restrictions on cotton textiles, Japan maintained export controls throughout the year limiting shipments of some cotton goods to the United States. In September, after conversations with U.S. officials, Japan announced that, beginning in 1957, it would establish comprehensive controls over exports of cotton cloth, apparel and manufactured items to the U.S. market; these controls apparently would limit such exports for a number of years, initially to 1955 levels.

Customs Simplification.—In August, President Eisenhower approved the Customs Simplification act of 1956, which, among other things, changed the method of determining the dutiable value of imported goods subject to ad valorem duties. Earlier customs simplification acts, approved in 1953 and 1954, had modified various customs methods and procedures, but had not amended U.S. valuation procedures. The new legislation established the "export value" of imported products as the primary dutiable value. Previously, customs appraisers had been required to determine both the export value and the foreign value of imported goods; the ad valorem duty was then levied on the basis of the higher of the two values.

The new method for determining primary dutiable value was not to be applied to all merchandise subject to ad valorem duties. The treasury was directed to determine those imported articles on which the use of "export value" would reduce their dutiable value by 5% or more (based on actual imports in 1954). For such articles, the customs' appraisers were to continue to ascertain both export value and foreign value, the higher of the two to be regarded as dutiable value. Late in the year, the treasury had not published the list of excepted articles. According to reports, however, the number of such articles was expected to be a small fraction of all imported articles subject to ad valorem duties.

(See also INTERNATIONAL TRADE.) (D. L.H.; G. P. H.)

ENCYCLOPEDIA BRITANNICA FILMS.—*Distribution of Foods* (1946); *Food and People* (1956); *Round Trip: The U.S.A. in World Trade* (1952); *World Affairs Are Your Affairs* (1952); *World Trade for Better Living* (1951).

Taxation. Net budget receipts of the federal government for the fiscal year ending June 30, 1956, were the highest in the history of the United States. Rising levels of personal income and corporate profits pushed receipts to \$68,141,000,000, an increase of \$3,641,000,000 over the estimates made in the budget presented in January. Expenditures, which also increased over the January budget estimates, amounted to \$66,386,000,000. The surplus, which in January was expected to be \$230,000,000, was actually \$1,754,000,000. This was used principally to reduce the public debt.

U.S. Legislation.—The *Midyear Review* of the 1957 federal budget, published Aug. 28, 1956, anticipated continued increases in expenditures. The 1956 legislation expanded defense, agricultural, social security and housing programs; authorized the "soil bank" program and a huge highway program (the latter to be financed outside the regular budget); initiated a flood insurance program and various flood control and navigation projects. The midyear estimates indicated that in the fiscal year 1957 the increase in receipts would not keep pace with the increase in expenditures, and that the surplus would be reduced to \$707,000,000.

Federal tax legislation in 1956 was designed to maintain or increase revenue. The five percentage point reduction in the corporation income tax rate and various reductions in excise taxes which had been scheduled for April 1, 1956, were postponed for one year. Some of the excise taxes scheduled for reduction were incorporated into the Highway Revenue act of 1956.

A few minor tax reductions were enacted. Gasoline used on the farm was exempted from the tax on gasoline. Admissions up to 91 cents and transportation fares up to 61 cents were exempted from the 10% excise taxes on these services.

Substantial increases were enacted in taxes outside the regular budget. The old age and survivors' insurance program was expanded to include disability insurance and to provide benefits for women retiring between the ages of 62 and 65. To finance these added benefits social insurance taxes were increased to 2½% on the first \$4,200 of wages and salaries for both employers and employees and to 3⅜% for the self-employed (effective Jan. 1, 1957).

An unprecedented highway aid program was enacted for the expansion and modernization of the interstate highway system. To finance this program new and increased highway user taxes were levied and earmarked for a highway trust fund for payment to the states. The higher taxes (effective July 1, 1956) included an increase from 2 cents to 3 cents per gallon in the tax on gasoline, diesel fuel and special motor fuels; an increase from 5 cents to 8 cents per pound in the tax on tires for highway vehicles; an increase from 8% to 10% of manufacturers' price in the tax on trucks, buses and truck trailers. A new tax of 3 cents

per pound was imposed on tread rubber, and also an annual licensing fee of \$1.50 per 1,000 lb. on vehicles with a total weight of more than 26,000 lb.

U.S. State Taxation.—In 1956 about half of the state legislatures convened, as compared with 1955 when all but one met. The unusually large volume of tax legislation in 1955 was reflected in 1956 tax collections, which hit an all-time high of \$13,335,000,000. The 15% increase of state tax collections in 1956 over 1955 was one of the largest in history. State tax collections by source are shown in the table.

State Tax Collections by Source*

Tax	Fiscal Year 1956	
	Amount (millions)	Percentage distribution
Total	\$13,335	100.0
Sales and gross receipts	7,779	58.3
General sales or gross receipts	3,026	22.7
Motor fuels	2,683	20.1
Alcoholic beverages	542	4.1
Tobacco products	513	3.8
Other	1,017	7.6
Licences	2,019	15.1
Motor vehicles and operators	1,291	9.7
Corporations in general	333	2.5
Other	394	3.0
Income taxes†	2,258	16.9
Individual income	1,377	10.3
Corporation net income	880	6.6
Property taxes	468	3.5
Death and gift	304	2.3
Severance	358	2.7
Other	149	1.1

*Preliminary; detail will not necessarily add to totals because of rounding.

†Individual income tax figures include the corporation net income tax of five states.

Source: Department of Commerce.

In 1956 there were relatively few increases in state tax rates.

Several states extended "emergency" taxes or temporary tax increases enacted in 1955 and prior years. In Massachusetts, "emergency" taxes on income, insurance companies, cigarettes, etc., were extended for another year. Rhode Island extended for a year its "emergency" sales and use taxes, and taxes on corporate incomes and pari-mutuel betting. The Mississippi Emergency Revenue act of 1955, which imposed a surtax of 14% of the income, estate and various privilege and severance taxes, was extended to 1958.

Among the tax changes in 1956 were the following:

Connecticut levied temporary increases (for flood relief) in its taxes on retail sales, cigarettes, alcoholic beverages, motor fuels and theatre seats. Kentucky imposed higher taxes on individual and corporate incomes and on distilled spirits. Louisiana increased its liquor and pari-mutuel taxes. Maryland raised its corporate income tax from 4.5% to 5%. New Jersey raised its cigarette tax from 3 cents to 5 cents per package. New York enacted a reduction of 15% of the first \$100 and 10% of the next \$200 of income tax on individuals. Ohio raised its cigarette tax from 2 cents to 3 cents per package. Pennsylvania increased its corporate income tax from 5% to 6%. West Virginia increased its cigarette tax and the fee on pari-mutuel pools, and enacted a new franchise tax on insurance companies.

Canada.—Walter Harris, minister of finance, reported in his budget speech on March 20, 1956, that revenues and expenditures for the fiscal year ending March 31, 1956, were higher than those originally estimated. The revenue of \$4,385,000,000 reflected greater expansion, employment and prosperity than expected. Expenditures amounted to \$4,437,000,000, an increase of \$75,000,000 over the original estimate. New legislation for wheat storage, agricultural supports plus higher interest on the public debt accounted for a large part of the increase. The deficit for fiscal 1956 amounted to \$52,000,000.

For the fiscal year ending March 31, 1957, Harris estimated revenues at \$4,763,000,000 (after proposed tax changes), expenditures at \$4,650,000,000, and a surplus of \$113,000,000. He did not propose any general tax reduction. "Clearly," he said, "it is only sound and responsible finance to run a modest



"... AND AS YOU CAN SEE I NEVER RECOVERED from my first income tax jolt," a cartoon of 1956 by Lichty of the Chicago Sun-Times Syndicate

surplus in times as good as these we are now in."

While there were no general changes in tax rates, other changes involved an expected revenue loss of \$12,000,000. The definitions of exempt building materials and production goods under the manufacturers' sales tax were broadened. A special excise tax of 20% was imposed on the gross advertising revenues of special editions of non-Canadian periodicals (effective Jan. 1, 1957). Certain technical changes and clarifications were made in the provisions of the income tax law relating to profit-sharing plans and the depletion allowance in the oil industry.

(See also BUDGET, NATIONAL; DEBT, NATIONAL; MUNICIPAL GOVERNMENT.) (H. J. Mr.)

Taylor, Maxwell Davenport (1901-), U.S. army officer. was born on Aug. 26 at Keytesville, Mo., and was graduated from the U.S. military academy at West Point, N.Y., in 1922. Later he studied at the army's engineer and field artillery schools, at the Command and General Staff school, Fort Leavenworth, Kan., and at the Army War college in Washington, D.C. After three years in Hawaii (1923-26) he transferred to the field artillery. He taught at the U.S. military academy from 1927 to 1932 and later (1945-49) was academy superintendent.

After U.S. entry into World War II Taylor helped train the first U.S. air-borne divisions and was made artillery commander of the 82nd air-borne division which participated in the Sicilian and Italian campaigns. In March 1944, prior to the Normandy landings, he became commander of the 101st air-borne division, which saw some of the war's fiercest fighting, including the Battle of the Bulge in Dec. 1944.

After his retirement as superintendent of West Point, Taylor was U.S. commandant in Berlin, Ger. (1949-51), and assistant, then deputy army chief of staff in charge of operations (1951-53). In Feb. 1953 he took command of the U.S. 8th army in Korea, soon being advanced to the rank of full general. After the Korean armistice in July 1953, Taylor remained to assure

observation of the armistice terms and to direct the rehabilitation of South Korea. He became commander of the U.S. army far eastern forces on Nov. 20, 1954.

On May 13, 1955, Pres. Dwight D. Eisenhower named Taylor chief of staff of the U.S. army, to succeed Gen. Matthew B. Ridgway as of June 30. In July 1956 Taylor was reported to have opposed a plan under consideration by Adm. Arthur W. Radford (*q.v.*), chairman of the U.S. joint chiefs of staff, to reduce U.S. armed forces personnel by a reported figure of 800,000 within four years.

Tea. The London auctions opened in April 1956 with the best grades of north India tea sharply higher in price, the best Assam broken pekoes at 6s.10d. per pound, and fannings at 8s. per pound, up about 1s. Common teas, in contrast, were approximately 3s.5½d., barely sufficient to cover costs of many producers. The Colombo (Ceylon) auctions were at a state of near collapse in May, following record Ceylon production of 380,000,000 lb. in 1955-56. Shipment of unrestricted quantities of medium-grown teas direct to London for auction was then permitted. Prices advanced later in the year under the influence of U.S. and South African buying, plus a three-way trade involving Ceylon tea, Egyptian cotton, and Japanese sterling. The U.S.S.R. took Indian tea in part payment for steel.

Tea imports into the U.S. in 1955-56 were 101,455,000 lb. valued at \$50,985,000 compared with 96,638,000 lb. valued at \$63,618,000 in 1954-55. Under the stimulus of major merchandising programs and improved packaging, the U.S. continued to use about .63 lb. of tea per capita in 1956, the same as 1955, but about 11% more than in 1947-49. Usage in the United Kingdom was reported as approximately stabilized at an average 11 oz. per household per week.

The long awaited report on the tea industry of India was submitted by a commission appointed in 1954. It recommended reduction in the internal price of tea to increase domestic consumption; creation of a tea replanting fund to replace at least the 29% of tea bushes which it estimated would end, within the next 5 years, their approximate 60 years of productive life; a labour welfare organization for the more than 1,000,000 workers employed by the tea industry; abolition of the quota export system; and decrease in remuneration of managers and payment of a consolidated salary instead of a commission to them. The report resulted in considerable discussion and criticism, particularly in the U.K. Production in India for the first three months of the crop year was 125,065,000 lb., 8.4% larger than in the same period of 1955.

In view of the oversupply of ordinary teas, the Calcutta Tea Regulation committee recommended that tea picking be halted on Nov. 20 instead of continuing as usual until the end of December.

The Pakistan Tea board approved a ten-year plan to increase tea production from 55,000,000 lb. to 80,000,000 lb. and acreage from 75,000 ac. to 100,000 ac. Ceylon, with 365,518 ac. under tea cultivation as of March 1955, uprooted 10,000 ac. of uneconomic plantation during the year. Argentina stressed tea output and with 33,000 ha. of tea plantings, mostly just coming to bearing age, began to search for export markets. Kenya and Uganda teas were offered at the first auction held in Nairobi, Kenya.

(J. K. R.)

Telegraphy. Progress of the telegraph industry in 1956, the centennial of the Western Union Telegraph company's incorporation under its present name, was featured by continued rapid expansion in the facsimile, microwave and private wire fields.

Facsimile.—Additional compact Desk-Fax machines were

Western Union Telegraph Company—Statistics

(Fiscal Year Ended Dec. 31, 1955)

Item	Amount	Item	Amount
Gross operating revenues	\$242,097,359	Average hourly earnings of employees, apart from messengers	\$1.88
Income from operations (after federal income tax)	\$13,040,690	Miles of telegraph circuits	3,622,161
Telegraph offices and agencies	23,290	Miles of carrier-equipped telegraph circuits	2,893,409
Number of employees	39,763	Nautical miles of ocean cable	28,378
Salaries, wages, social security taxes, pensions and other benefits	\$149,186,473		

placed in operation in the offices of business firms in all parts of the United States during 1956, enabling businessmen to send telegrams instantly in picture form by pressing a button. Progress was made in providing business firms with direct wire connections giving them immediate access to Western Union's high-speed message network, a total of 50,000 customers having been equipped with printing telegraph and Desk-Fax facsimile machines. Also, private facsimile systems, called Intrafax, were leased to many firms to connect their scattered departments, offices and buildings for fast and efficient communications.

Radio Beam System.—Western Union was carrying out the extension to Cincinnati, O., and Chicago, Ill., of its microwave radio beam system, which by late 1956 had 220,150 telegraph channel miles in operation between Philadelphia, Pa., Washington, D.C., and Pittsburgh, Pa. The extension would add almost 11,000 channels between Pittsburgh, Cincinnati and Chicago for leasing to industry and government. Dual mast towers 127 to 270 ft. in height and 20 to 50 mi. apart on elevated ground would be used, replacing the old pole lines.

As of June 30, 1956, telegraph channel mileage approximated 33,850,000 for message services. Two-thirds of this mileage was derived from the use of "carrier" equipment which creates a multiplicity of message circuits on a single radio beam or pair of wires. Prior to 1945 only 110,000 mi. of carrier channel facilities were in Western Union service.

Integrated Data Processing.—A factor contributing to the rapid growth of private wire systems is their ability to transmit data for processing by business machines and computers. The first nationwide private wire system, designed exclusively for automatic transmission of control data, was placed in operation in 1956 for Sylvania Electric Products, Inc. This 18,000-mi. network connects 61 cities with Sylvania's data processing centre at Camillus, N.Y.

Another nationwide private wire system installed by Western Union in 1956, for E. F. Hutton & company, stockbrokers, was designed to meet the maximum speed requirements of brokerage firms. The system, linking 20 cities, is the world's fastest. It can flash an order 2,600 mi. from the Hutton Los Angeles, Calif., office to New York city and the floor of the New York Stock exchange in 8 to 10 sec. The entire transaction, from the time the order is placed at Los Angeles to the arrival of the confirmation back in Los Angeles, takes less than 60 sec.

Armed Services.—The air matériel command awarded Western Union a contract in 1956 to carry out a plan to unify and improve the efficiency of the domestic and global communications system of the U.S. air force. The new centres would be part of a 1200,000-mi. network leased by Western Union to the air force. Messages would be typed only once at origin and flashed automatically to any air force base in the world.

New multipoint selective signalling equipment was designed and built by Western Union for the signal corps, and frequency modulation carrier telegraph terminal equipment was developed for use in distant overseas communications.

Financial.—By 1956 the number of Western Union stockholders increased 43%, from 19,942 to 28,450, after the company's stock was split 4-for-1 on May 17, 1955. Revenues from facsimile and private wire services had grown nine-fold since

1946 and in 1956 were running at the rate of more than \$35,000,000 a year. About 2,000,000 mi. of Western Union's wire facilities were devoted to private wire services.

Submarine Cables.—Western Union agreed to sell the Western Union Cable system to American Securities corporation, subject to regulatory and stockholder approvals and other conditions, for \$18,000,000 plus an amount equal to net current assets. A definitive contract was to be executed after various problems were resolved. This agreement followed termination of negotiations with Trextron American, Inc., in 1955 for purchase of the cable system by a subsidiary of Trextron.

(See also FEDERAL COMMUNICATIONS COMMISSION.)

(W. P. MA.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Development of Communications* (From Telegraph to TV), 2nd ed. (1955); *Story of Communications* (1955).

Telephone. At the end of 1956 there were an estimated 109,000,000 telephones in the world. Of these, approximately 60,000,000 were in the United States.

Fourteen countries had more than 1,000,000 telephones each. Besides the U.S., they were the United Kingdom (with more than 7,000,000 phones), Canada (with more than 4,500,000), the German Federal Republic (West Germany), France, Japan, Sweden, Italy, Australia, Switzerland, Argentina, the Netherlands, Spain and the German Democratic Republic (East Germany).

Bell system overseas service was extended during 1956 to Kuwait, on the Arabian peninsula, to Saudi Arabia and to Jordan. Telephone users in the United States could call any of nearly 105,000,000 telephones throughout the world at the end of 1956. About 85% of all U.S. telephones were dial-operated.

Transoceanic Cables.—A transatlantic telephone cable system, first ever to span an ocean, was officially opened Sept. 25, 1956. The twin-cable system stretches 2,250 mi. across the bottom of the Atlantic between Newfoundland and Scotland. It is connected by land facilities with the telephone networks of the United States, Canada and Great Britain. The submarine system can carry 36 conversations at the same time, or about three times the capacity of radiotelephone circuits between Great Britain and North America. A joint undertaking of American Telephone and Telegraph company, the British post office and the Canadian Overseas Telecommunication corporation, the project had been under construction for more than two years and cost \$42,000,000.

Also completed late in 1956 by A.T. & T. was a similar undersea cable system extending 870 mi. between Port Angeles, Wash., and Ketchikan, Alaska.

Work was under way on a third cable system, spanning 2,500 mi. of the Pacific ocean between Point Arena, Calif., and the shore of Hanauma bay in the Hawaiian Islands. It was expected to be in service by late 1957. The new cable systems make overseas telephone service speedier and more reliable, since they are not subject to atmospheric disturbances which sometimes affect radiotelephone.

Financing.—The total investment in telephone plant and

U.S. Telephone Statistics

(As of July 1, 1956)

Item	Bell system*	Total U.S.
Number of telephones	47,773,000	58,083,000†
Dial telephones	41,909,000	49,113,000
Manual telephones	5,864,000	8,970,000
Miles of wire	206,147,000‡	228,200,000
Number of central offices	9,882	21,076
Average daily conversations (Jan.-June 1956)	179,000,000	217,000,000
Total investment in plant and equipment	\$16,148,102,000	\$18,500,000,000

*American Telephone and Telegraph company and its principal telephone subsidiaries. In addition to Bell system, includes: Bell Associated (noncontrolled Southern New England and Cincinnati & Suburban Bell Telephone companies), 1,508,000; Bell Service (principally telephones on rural or farmer lines connecting directly with Bell system), 347,000; independent (4,590 companies), 8,455,000.

196% in cable.

ENCYCLOPÆDIA BRITANNICA FILMS.—*Development of Communications* (From Telegraph to TV), 2nd ed. (1955); *Story of Communications* (1955).

Television: see FEDERAL COMMUNICATIONS COMMISSION; MEDICINE; RADIO AND TELEVISION.

Tellurium: see MINERAL AND METAL PRODUCTION AND PRICES.



PICTURE PHONE, an experimental model of a telephone equipped with two-way picture transmission, demonstrated by Bell Telephone laboratories in 1956

equipment in the U.S. reached \$18,500,000,000 by June 30, 1956. This figure was growing rapidly. For example, in 1956 alone, the Bell system spent more than \$2,000,000,000 for new construction to meet the public's growing requirements for telephone service. In Sept. 1956, at a special meeting, the company's share owners authorized the largest direct offering of stock ever made by a U.S. corporation. About 5,720,000 shares were involved in the offering, which was expected to make about \$572,000,000 available to meet Bell system needs for new capital. The shares were offered to share owners at \$100 par, on the basis of one new share for each ten shares outstanding. With about 1,450,000 share owners, the Bell system continued to be the most widely owned of all businesses in the world at the end of the year.

Electronic Phone Connections.—Work advanced on the development of new central office equipment which works on electronic principles. It makes use of the transistor, the tiny amplifying device invented at Bell laboratories that operates on a fraction of the power needed by a vacuum tube. The new switching apparatus operates at unbelievably high speeds. The first telephone central office of this kind was planned for Morris, Ill., and was expected to be ready for service early in 1959.

Defense Developments.—Bell laboratories during 1956 developed an improved transistor that opened the way for many new possibilities in military technology. The new transistor's superior performance at very high frequencies makes it ideally suited for application in guided missiles and electronic "brains." Progress was made, too, on a nation-wide semiautomatic air warning control system integrating U.S. radar and defense weapons. The system, known as SAGE, was to include numerous centres where radar information could be electronically computed to guide defensive weapons. In the North American arctic area, work neared completion on a series of radar stations designed to give the U.S. and Canada advance warning of an air attack. Western Electric, manufacturing and supply unit of the Bell system, was the prime contractor for the U.S. air force in building the arctic radar fence, known as the distant early warning (DEW) line.

(See also FEDERAL COMMUNICATIONS COMMISSION; RURAL ELECTRIFICATION ADMINISTRATION.)

(F. R. K.)

Tennessee. A south central state of the United States, 16th to enter the union, Tennessee is called the "Volunteer state." Land area, 41,797 sq.mi., water area about 447 sq.mi. Population (1950): 3,291,718; rural 1,839,116; urban 1,452,602; rural farm 1,016,204; white 2,760,250; nonwhite 531,468. The July 1, 1956, estimated population was 3,466,000. The population of principal cities in 1950; Nashville (cap.) 174,307; Memphis 396,000; Chattanooga 131,041; and Knoxville 124,769.

History.—With three Tennesseans (Gov. Frank G. Clement, Sen. Estes Kefauver and Sen. Albert Gore) being prominently mentioned for national political office, more than usual interest was manifested in the meeting of the Democratic state convention which was to select Tennessee's delegation to the national nominating convention. Despite Senator Kefauver's strong campaign for the presidential nomination, the state convention refused to endorse him and instead instructed the Tennessee delegates, most of whom were Clement supporters, to cast their votes for any Tennessean who had an "opportunity" to be nominated for the presidency or vice-presidency. Shortly after this action was taken Senator Kefauver withdrew his candidacy for the presidential nomination. At the national Democratic convention Governor Clement was keynote speaker, and Senator Kefauver was selected as vice-presidential nominee, the Tennessee delegation giving him their support after first supporting Senator Gore for that office.

In a mild political surprise, Republican presidential candidate Dwight D. Eisenhower won Tennessee's electoral votes for the second successive time in the general election on Nov. 6. Eisenhower not only rolled up a bigger majority than in 1952, but carried native son Estes Kefauver's home town, county and congressional district, and put the Democratic stronghold of Shelby county (Memphis) in the Republican ranks for the first time since the Reconstruction period. Eisenhower's total vote was 462,288, as against 456,507 for Adlai E. Stevenson and Kefauver, and 19,820 for States Rights candidate T. Coleman Andrews.

In the state congressional races all incumbent representatives were returned with the exception of J. Percy Priest, of the fifth district, who died shortly after being nominated for a ninth successive term. Priest was replaced by veteran district attorney general, J. Carlton Loser. There was no race for U.S. senator or governor this year.

Tennessee attracted national attention in the field of traffic safety when, under the leadership of new safety commissioner, Hilton Butler, the state highway patrol set up periodic surprise roadblocks on important state and federal highways to check for drunken drivers and for those without licences, and to impress drivers with the need to obey state traffic laws and to observe basic rules of safety. As a result of this campaign, Tennessee's number of traffic fatalities during the first eight months of 1956 showed a reduction of 16% over the comparable period of 1955.

Integration of white and Negro students in Tennessee institutions of higher learning proceeded without incident, but violence flared in Anderson county over Labor Day weekend when Negro children sought admission to the high school at Clinton, which had been ordered to desegregate by U.S. District Judge Robert L. Taylor. The presence of prosegregation leaders, a number of whom were from outside the state, was blamed for rioting that resulted in injuries to a few persons. Governor Clement,

on request from local authorities who were unable to cope with the rioters, sent in 2 battalions of national guard troops and 100 state highway patrolmen to help restore order. By the end of September the integration had been accomplished without any recurrence of violence.

In the primary elections in August, which are tantamount to election, all Tennessee representatives to congress were renominated. Neither senate seat became vacant in 1956.

Chief state officers during 1956 were: governor, Frank G. Clement; lieutenant governor, Jared Maddux; secretary of state, G. Edward Friar; treasurer, Ramon Davis; comptroller, William R. Snodgrass; attorney general, George P. McCanless; and adjutant general, Joe Henry, Jr.

Education.—Enrolment in elementary and high schools during the school year 1955-56 was 754,945, with an average daily attendance of 677,816. The total number of public school teachers was 26,081. Grand total expenditures for public schools from all sources during 1954-55, the latest year for which figures were available, were \$131,022,111.89; for special schools \$1,322,917.02; and for six state colleges and the University of Tennessee \$14,669,831.43 out of state funds. The commissioner of education was Quill Cope.

Social Insurance and Assistance, Public Welfare and Related Programs.—During 1955 the total amount of unemployment compensation paid was \$29,009,057 for 1,541,596 man-weeks of unemployment. Other public assistance during 1955-56 totalled \$44,330,889.90, of which \$26,136,889.60 was for old-age assistance, \$15,773,706.00 for dependent children, \$1,564,446.90 aid to the blind, and \$855,847.40 for disabled persons. As of June 30, 1956, there were 61,043 recipients of old-age assistance, 19,683 dependent children, 3,129 blind and 2,268 disabled persons receiving public assistance.

In 1955-56 there were 4 juvenile and correctional institutions with 730 inmates and expenditures of \$780,093.61; 3 penal institutions with 2,820 inmates and expenditures of \$1,740,820.12; 4 state hospitals for the insane with average population of 7,486 and one home for the mentally deficient with an average population of 1,087. Total state expenditures for mental health were \$5,982,504.61.

Communications.—Of the 70,044.56 mi. of public roads on Jan. 1, 1956, 8,329 mi. were state highways. There were 56,292.44 mi. of country rural roads and 4,363.70 mi. of county urban roads. State and federal parks and reservations contained an additional 1,059.52 mi. of roads. Total highway expenditures during the fiscal year were \$83,722,617 of which \$48,890,838 was from the state and \$24,831,779 from counties. There were 3,443.34 mi. of railroad on Oct. 1, 1955.

Banking and Finance.—On June 30, 1956, there were 220 state banks with 66 branches and assets of \$807,583,675.02; and on April 10, 1956, there were 76 national banks with assets of \$1,957,404,000. Savings and loan associations on June 30, 1956, numbered 48 with total assets of \$423,275,319.09. Of these 47 were federal associations with assets of \$422,749,625.83.

Total state revenue from all sources in 1955-56 was \$325,906,283.68. Federal aid was \$61,073,084.79. Proceeds from bonds sold were \$8,550,000, and debt outstanding decreased \$6,461,500 to a total of \$107,373,500 on June 30, 1956. Of total disbursements from state appropriations of \$317,602,887.37, \$95,866,409 was for education, \$59,778,419 for highways, \$47,873,123 for public welfare and \$38,342,260.50 for cities and local governments. Accrued surplus on June 30, 1956, was \$10,502,781, plus a working capital reserve of \$25,000,000.

Agriculture.—Another drought year in 1955 brought an 8% decrease in cash receipts from farming in Tennessee, from \$473,817,000 in 1954 to an estimated \$436,698,000 in 1955. Income from livestock and products in 1955 was \$210,582,000; from crops \$220,505,000; and from government payments \$5,611,000. Value of crops, livestock and products consumed by families on the farms where they were produced was estimated at \$83,470,000. Cotton remained Tennessee's leading cash crop in 1955, but tobacco dropped from second to fourth place behind dairy products and cattle and calves, which ranked second and third respectively.

During 1955, 70,613 ac. of forestland were burned by 3,467 forest fires. Estimated forest area in Oct. 1956, was 13,000,000 ac.

Manufacturing.—Tennessee experienced one of its best years of industrial expansion in 1955. Total investment in industrial expansion was \$176,000,000 for 138 new industries and 197 expansions of established concerns in 86 different towns and cities. During 1955 the total estimated value of manufactures was \$3,797,000,000, an increase of \$453,000,000 and an

Table II.—Principal Industries of Tennessee

	All employees 1954	Salaries and wages 1954 (in 000s)	Value added by manu- facture 1954 (in 000s)	Value added by manu- facture 1953 (in 000s)
Food and kindred products	27,379	\$ 90,339	\$186,049	\$173,420
Textile mill products	32,975	83,721	139,877	141,422
Apparel and related products	28,825	53,179	83,642	78,486
Lumber and products (except furniture)	17,721	40,377	68,313	66,138
Furniture and fixtures	10,061	27,206	43,084	46,394
Paper and allied products	7,679	30,811	62,736	58,514
Printing and publishing	10,254	40,455	67,769	...
Chemicals and products	43,083	197,191	455,691	...
Leather and leather products	10,807	25,726	57,306	55,229
Primary metal industries	11,579	45,119	92,598	104,911
Fabricated metal products	15,613	53,122	94,966	79,617
Machinery (except electrical)	8,962	33,821	57,251	58,381
Electrical machinery	3,965	13,455	32,096	...
Transportation equipment	6,083	25,732	56,911	38,920
Stone, clay and glass products	8,471	25,988	48,628	...

*Withheld because the estimate did not meet publication standards, either on the basis of the associated standard error of estimate or on the basis of a consistency review.
Source: U.S. Department of Commerce, 1954 Census of Manufactures, preliminary report.

estimated 291,300 persons were engaged in manufacturing in 4,700 establishments. Total wages paid to persons covered by unemployment compensation were \$977,619,791. In Aug. 1956, 187,400 persons were engaged in the manufacture of nondurable goods and 108,000 in the manufacture of durable goods. Leading employing industries were chemicals with 47,500, textiles with 33,600, fabricated metal products with 17,800, and lumber with 22,400. (W. T. A.)

Table III.—Mineral Production of Tennessee

(In short tons, except as noted)

Mineral	Quantity 1953	Value 1953	Quantity 1954†	Value 1954†
Total		\$98,050,000		\$105,686,000‡
Cement (bbl.)	7,277,000	18,283,000	7,569,000	19,734,000
Clays	1,037,000	3,479,000	1,015,000	3,781,000
Coal	5,467,000	25,152,000	6,429,000	25,477,000
Coke	231,000	?	154,000	?
Copper	8,000	4,494,000	9,000	5,362,000
Lime	114,000	1,177,000	80,000	968,000
Manganese ore	3,000	202,000	12,000	920,000
Phosphate rock	1,701,000	11,305,000	1,633,000	11,743,000
Sand and gravel	5,231,000	5,630,000	5,155,000	6,141,000
Stone	10,485,000	16,948,000	14,040,000	22,046,000
Zinc	38,000	8,847,000	30,000	6,550,000
Other minerals . . . . .	...	2,533,000	...	5,553,000

*Values for processed materials are not included in the totals.

†Preliminary.

‡Total has been adjusted to eliminate duplication in the value of clays and stone.

Source: U.S. Bureau of Mines.

Mineral Production.—Table III shows the tonnage and value of those minerals produced in Tennessee in 1953 and 1954 whose value exceeded \$100,000. In 1954 the state was first among the states in ball clay and pyrite output, second in phosphate rock and fourth in manganese. It ranked 27th in the value of its mineral output, with 0.76% of the U.S. total.

ENCYCLOPEDIA BRITANNICA FILMS.—*Southeastern States*, 2nd ed. (1956).

Tennessee Valley Authority. Nearly three-fifths of the power that the Tennessee Valley authority sold during the 1956 fiscal year went to the United States Atomic Energy commission and other defense agencies. Out of total sales of 53,800,000,000 kw.hr. the Atomic Energy commission and the other defense agencies took 30,500,000,000 kw.hr. Use by the federal government agencies during the fiscal year was more than 15 times as great as in 1950, when less than 2,000,000,000 kw.hr. were sold to them. The increase in fiscal 1956 over 1955 was 39%, from 21,800,000,000 kw.hr. to 30,500,000,000 kw.hr.

During the year the installed capacity of the system was increased to 9,280,000 kw., compared with 7,810,000 kw. at the close of the 1955 fiscal year. Most of the increased capacity was constructed to supply the Atomic Energy commission, which operates two major plants at Oak Ridge, Tenn., and Paducah, Ky. The 1956 earnings of the power system amounted to \$53,900,000 out of total revenues of \$221,600,000 and represented a return of 3.9% on the TVA power investment, a trifle below the 4% annually earned over the entire period of TVA operations. TVA paid \$59,000,000 to the U.S. treasury during the year, bringing to more than \$210,000,000 its payments from power revenues. In addition, TVA had paid nearly \$35,000,000 to the treasury from nonpower proceeds.

Table I.—Principal Crops of Tennessee

Crop	Indicated 1956	1955	Average 1945-54
Corn, bu.	57,492,000	61,285,000	58,149,000
Oats, bu.	7,161,000	6,844,000	5,587,000
Soybeans, bu.	4,860,000	4,500,000	2,737,000
Barley, bu.	1,992,000	1,656,000	1,512,000
Hay, tons	1,955,000	1,949,000	1,896,000
Peanuts, lb.	2,400,000	2,850,000	3,132,000
Tobacco, lb.	133,500,000	129,397,000	145,122,000
Apples, bu.	410,000	64,000	353,000
Peaches, bu.	320,000	*	429,000
Pears, bu.	140,000	5,000	116,000
Potatoes, Irish, cwt.	784,000	945,000	1,142,000
Potatoes, sweet, cwt.	616,000	854,000	728,000
Wheat, bu.	4,322,000	3,417,000	4,152,000
Cotton, bales	575,000	623,000	564,000

*Less than 500 bushels.

Source: U.S. Department of Agriculture.

Municipal and co-operative electric systems bought 15,500,000 kw.hr. from TVA for distribution to 1,436,000 consumers in the 80,000-sq.mi. area they serve. During the year, residential consumers of TVA power used an average of 5,812 kw.hr. per customer, which was more than double the national average. When TVA was established in 1933, the average residential use, both in the nation and in the present TVA area, was about 600 kw.hr. per customer.

Use of the navigation channel provided by the TVA multiple-purpose dams continued its rapid growth, with more than 1,600,000 ton-miles of traffic moving in 1955. Users of the waterway saved an estimated \$16,700,000 in freight costs compared with the next cheapest available mode of transportation. Traffic in 1955 was 32% above 1954.

Although water conditions had been below normal generally for four years, storms produced flood conditions which the TVA system was called on to regulate. At Chattanooga, Tenn., two flood crests were reduced with savings of \$200,000 in flood damage, and nearly \$700,000 of flood damage was averted on the lower Ohio and Mississippi rivers by TVA operations.

TVA's production of 257,700 tons of phosphate and nitrogen fertilizers in the fiscal year 1956 was a 26% decrease from the previous year. TVA is not a commercial producer of fertilizers, and its output is used in farm test demonstrations and in educational sales conducted by farm co-operatives and private industry firms in 35 states. The programs emphasize improved fertilizer practices and stimulate demand for fertilizers to be supplied by private industry. The results of TVA's fertilizer research and development are made available to private industry, and through 1956 more than 90 licences had been issued to commercial firms for use of TVA-developed processes or equipment.

TVA seeks to encourage the states in resource development activities. In the fiscal year 1956, state forest nurseries for the first time produced more seedlings for use in reforestation than did TVA. In two decades, nearly 300,000 ac. had been reforested, with 90% of the seedlings provided by TVA.

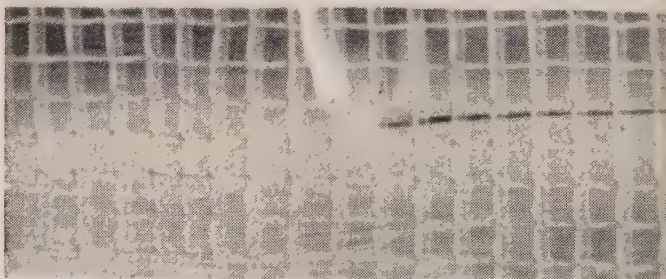
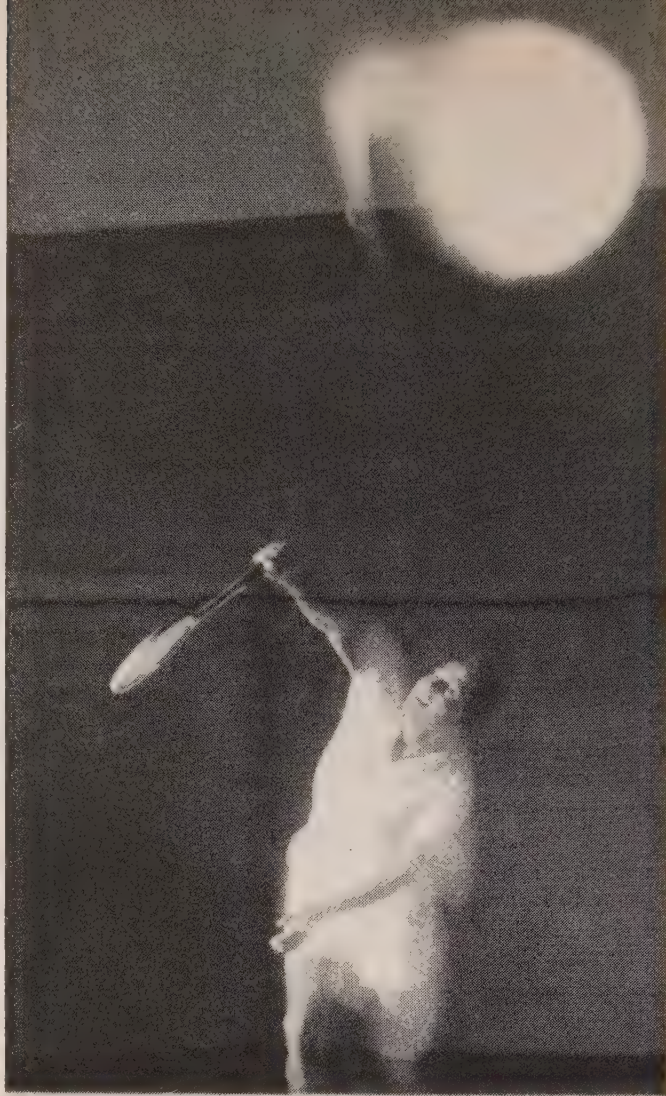
Members of the TVA board of directors in 1956 were Brig. Gen. Herbert D. Vogel, retired, chairman; Harry A. Curtis; and Raymond R. Paty. (See also ELECTRICAL INDUSTRIES.)

(K. R. K.)

Tennis. Australia dominated international amateur lawn tennis play in 1956. The two Australian Davis cup champions, Lewis Hoad and Kenneth Rosewall, won all the important international championships between them and, following a round-the-world tour, returned to Australia to participate in various state championships prior to defending the Davis cup in the 1956 Challenge round at Adelaide at the end of the year.

Davis Cup.—Thirty-two nations challenged Australia for the Davis cup in 1956. Italy again won the European zone competition, defeating Sweden 5-0. The United States defeated Canada and Mexico to win in the American zone. In the interzone semifinal, the U.S. defeated Italy 4 to 1 at Forest Hills, N.Y., in September. Nicola Pietrangeli and Orlando Sirola played for Italy and the U.S. players were E. Victor Seixas, Hamilton Richardson, Samuel Giammalva and Michael Green. The winner was scheduled to meet India, which won the eastern zone, in the interzone final at Perth, Austr., early in Dec. 1956, for the right to challenge Australia.

Men's Singles.—Hoad won the singles championships of Australia, France and Great Britain and needed only to win the U.S. title to equal the 1938 record of W. Donald Budge, the only player who ever won the world's four major championships in the same year. However, Hoad was beaten by Rosewall in the all-Australian final of the U.S. championship at Forest Hills.



A SMASH by Richard "Pancho" Gonzales, who established himself as the outstanding professional player of 1956 after a series of matches against Tony Trabert. Of the 101 matches played, Gonzales won 74

The score was 4-6, 6-2, 6-3, 6-3. In the Australian and Wimbledon finals Hoad had beaten Rosewall in four sets. At Forest Hills, Richard Savitt of the U.S., former Australian and Wimbledon singles champion, gave Rosewall his toughest battle in the U.S. championship which the Australian won, 6-4, 7-5, 4-6, 8-10, 6-1. Seixas, the only American to reach the semifinals at Forest Hills, was beaten by Rosewall, 10-8, 6-0, 6-3. Hoad also won the Italian championships, defeating Sven Davidson of Sweden who also was runner-up to Hoad for the French title. Rosewall, after winning the U.S. title, lost to Herbert Flam, U.S., in the final of the Pacific Southwest championship at Los Angeles, Calif. Earlier in the U.S. Rosewall lost to Richardson in the Eastern Grass Court championships which Richardson won, but Rosewall defeated Richardson to win the important Newport Invitation tournament.

Men's Doubles.—Hoad and Rosewall won recognition as the

world's top amateur doubles team as well as the foremost singles players. They won the doubles championships of Australia, Great Britain and the United States. Rosewall did not compete in the French championships in which Hoad was runner-up in the doubles with his countryman Ashley Cooper to Robert Perry of the U.S. and Don Candy, another Australian. In winning the Australian doubles title, Hoad and Rosewall defeated Mervyn Rose and Candy in straight sets; at Wimbledon they beat the Italian team of Pietrangeli and Sirola in the final and, at Longwood, Hoad and Rosewall downed the American team of Seixas and Richardson in four sets to gain the U.S. title. The two Australians completed their victorious tour by winning the Pacific Southwest doubles championship at Los Angeles.

Juniors.—For the first time an Australian player won the U.S. junior championship when left-handed Rodney Laver defeated Chris Crawford at Kalamazoo (Mich.) college. Ronald Holmberg, U.S., previously had defeated Laver for the British junior title at Wimbledon.

Women's Singles.—Since Doris Hart, U.S. women's champion in 1954 and 1955 had become a professional, two U.S. players, Shirley Fry and Althea Gibson, stood out among the women players in 1956. For the first time in the 12 years that she had been ranked among the first ten in the U.S., Miss Fry won the women's singles at Wimbledon and also at Forest Hills. In capturing her first British championship, Miss Fry defeated Miss Gibson, Louise Brough, former Wimbledon and U.S. champion, and in the final defeated Angela Buxton of Great Britain. In winning the U.S. title Miss Fry beat Miss Gibson in the final. She also defeated Miss Gibson to win the U.S. clay court title. Miss Gibson made a successful long tour abroad which included a trip to southeast Asia as a member of a U.S. good-will team. In Europe she defeated England's foremost players, Shirley Bloomer, Angela Buxton and Angela Mortimer, to win the French championship.

Women's Doubles.—In doubles the U.S. pair of Margaret Osborne duPont and Miss Brough scored their 11th win of the U.S. women's doubles championships at the Longwood Cricket club, Chestnut Hill, Mass. They had won the title nine years in succession, from 1942 to 1950, and in 1955 and 1956. Miss Gibson further distinguished herself by teaming with Miss Buxton to win the women's doubles championships of France and of Great Britain.

Wightman Cup.—At Wimbledon the U.S. team of Shirley Fry, Louise Brough, Dorothy Knodel and Beverly Baker Fleitz defeated Great Britain's team of Misses Mortimer, Buxton, Bloomer and Patricia Ward, to retain possession of the Wightman cup. (E. S. BR.)

Texas. Texas is a west south central state of the United States bordered on the southeast and southwest by the Gulf of Mexico and Mexico, respectively. It became a state through annexation Dec. 29, 1845, of the republic of Texas, 1836-45. Known as the "Lone Star state" from the single star in the flag of the republic, it is the largest state in the union. Land area, 263,513 sq.mi.; inland water, 3,826 sq.mi.; submerged coastal area, 5,078 sq.mi.; total, 272,417 sq.mi. Pop.: (1950 census) 7,711,194; (U.S. census provisional est. July 1, 1956) 8,925,000. Urban population (1950) 4,838,060, or 62.7%; total rural, 2,873,134, or 37.3%, divided into 1,580,867 nonfarm rural and 1,292,267 farm rural; white 6,726,534, nonwhite 984,660. Capital, Austin, with pop.: 132,459 (1950); 167,100 (1955 est.). Following are other cities ranked by population in 1950 with unofficial estimates for 1955 in parentheses: Houston 596,163 (714,000); Dallas 434,462 (575,000); San Antonio 408,442 (597,300); Fort Worth 278,778 (343,685); El Paso 130,485 (182,505); Corpus Christi 108,287 (165,000); Beaumont 94,-

014 (106,000); Waco 84,706 (112,600); Amarillo 74,246 (110,000); Lubbock 71,747 (110,000); Wichita Falls 68,042 (102,100).

History.—The Democratic primary race for governor was the principal political event of 1956. Principal contenders in the first primary were United States Sen. Price Daniel, Ralph Yarborough, a contestant for the place in each of the two preceding primaries, and W. Lee (Pappy) O'Daniel, former governor and former United States senator. The vote in the first primary was Daniel 622,321, Yarborough 460,134 and O'Daniel 347,757. In the second primary, Daniel won 698,187 to 694,844 over Yarborough. After the second primary, Daniel tendered his resignation from the United States senate effective Jan. 15, 1957, or earlier.

In the May 1956 convention of the Democratic party, the liberal element regained control from the conservatives who had been in direction of the party during the last two years. In the Sept. 1956 convention, however, Governor-nominate Daniel was able to gain control by a narrow margin through a coalition of conservatives and moderates.

The issue of segregation of Negro and white children in the public schools was a disturbing factor in many points of the state during 1956. At the end of the year, fewer than 10% of the 1,857 independent and common school districts had abolished segregation. Picketing and other mass demonstrations occurred at some points, notably at the town of Mansfield in Tarrant county. Where there was delay in abolishing segregation, school boards usually protested lack of time to make the adjustments.

Charges of dishonesty and poor administration in the state's land office and insurance department affairs, begun in 1955, were a campaign issue in the 1956 elections. Nine amendments to the state constitution were submitted to the people in the November elections, most important of which were those proposing (1) broadening tax powers of the county commissioners courts; (2) giving the legislature wider authority to use its own discretion in providing assistance to needy persons; (3) providing for different procedure in trial of lunacy cases, including waiver of jury trial; (4) providing greater freedom in investing the permanent funds of the University of Texas and A & M college of Texas; and (5) reorganizing the veterans' land board, increasing regulation of its activities and increasing from \$100,000,000 to \$200,000,000 the amount of bonds it may issue for assisting in the veterans' land-purchase program.

In the general election, Nov. 6, and the special election, Nov. 13 (set on this date by mistake of the legislature), the nine constitutional amendments were adopted. The Democratic ticket carried in Texas, as usual, except the vote for president, in which Pres. Dwight D. Eisenhower received a considerable majority, and in the Dallas district, where a Republican, Bruce Alger, was re-elected to congress.

The drought which had prevailed over most of Texas since 1949 continued throughout the crop-growing season of 1956, seriously cutting yields and drying livestock ranges. The declining flow in streams and the falling water tables in underground supplies also menaced the water supplies of approximately 50% of Texas' cities and towns, according to report of the state board of water engineers late in 1956.

Principal state officials for the term ending Dec. 31, 1958, were: governor, Price Daniel; lieutenant governor, Ben Ramsey; attorney general, Will Wilson; comptroller of public accounts, Robert S. Calvert; treasurer, Jesse James; state commissioner of education, J. W. Edgar (indefinite appointive term); commissioner of agriculture, John C. White; commissioner of the general land office, J. Earl Rudder; railroad commissioners, Ernest O. Thompson, Olin Culberson and William J. Murray (six-year overlapping terms).

Education.—Scholastic population for the school year 1955-56 was 1,853,492, according to the Texas State Education agency. Number of schoolteachers, 75,246; average salary, \$3,850. Scholastic apportionment from state available school fund was \$76 per scholastic per annum. In addition, there was supplementary state aid to local districts through the Gilmer-Aikin (equalization) act. Total revenues for school purposes, unofficial estimate, were approximately \$450,000,000, of which a little more than half came from local funds, a little less than half from state funds and less than 1% from federal funds.

Social Insurance and Assistance.—At the close of the fiscal year Aug. 31, 1956, 224,474 aged Texans were receiving monthly payments of \$41.88; 6,580 needy blind persons were receiving an average of \$45.81 monthly; and 66,864 dependent children (representing 21,705 families) were receiving an average of \$21.01 per child, or \$64.73 per family represented. These figures are according to the state department of public welfare. Total payments for the fiscal year were \$130,692,741.50, including \$111,410,645.25 for old-age assistance, \$15,731,429.00 for aid to dependent children and \$3,550,667.25 for aid to the blind.

Transportation and Communication.—There were 54,707 mi. in the state designated highway system at the end of the fiscal year Aug. 31, 1956, according to the state highway department. They were distributed: federal aid primary system, 15,935 mi.; exclusive state-aid highways, 10,439 mi.; farm-to-market roads, 28,333 mi. There were 50,851 mi. of these highways having asphalt, concrete or brick pavement. Total road system of Texas, including all rural roads, measures about 200,000 mi. Total receipts for year ending Aug. 31, 1956, were \$231,425,100; disbursements were \$212,524,394. Total number of vehicles registered March 31, 1956, was 4,087,165.

Texas railroad mileage Aug. 31, 1956, included 15,378.57 mi. of main-line track and 6,274.29 mi. of siding and other auxiliary track. Number of passengers carried during fiscal 1956 was 4,079,815; passenger revenue, \$17,537,361. Tons of freight, 166,742,660; freight revenue, \$395,422,200. There were 654 Texas airports listed by the Civil Aeronautics administration May 31, 1955, of which 43 were in use by standard air lines. Passengers enplaned (1955), 2,327,364; airmail enplaned, 8,633 tons; express cargo, 18,236 tons. A total of 136,927,140 short tons passed through Texas gulf ports during 1955, according to the U.S. army engineers. As of Aug. 1, 1956, there were 2,649,395 telephones in Texas.

State Government Finance, Banking.—State government receipts for the fiscal year ended Aug. 31, 1956, were \$913,422,792. Expenditures were \$805,686,551. Principal sources of revenue were: net motor fuel taxes, \$157,325,551; gross production tax on crude oil, \$136,295,770; mineral leases and rentals, \$79,548,891; motor vehicle license fees, \$52,423,152; ad valorem tax, \$30,521,892; production tax on natural gas, \$40,855,308; franchise taxes, \$31,817,516; occupation tax on insurance companies, \$22,450,937; all federal aid, including public welfare and highways, \$173,938,006. Principal expenditures were for education, \$323,980,814; pensions and other public welfare, \$147,274,441; highways, \$10,237,740; eleemosynary and correctional institutions, \$42,999,705. At the beginning of the year 1956, there were 487 national and 575 state banks in Texas; total 1,062, according to the Federal Reserve Bank of Dallas. National banks had \$9,188,735,000 in resources and \$8,496,017,000 in liabilities. The state banks had \$2,626,044,000 in resources and \$2,439,286,000 in liabilities. Total resources all banks, \$11,814,779,000; liabilities, \$10,935,303,000.

Agriculture.—Because of the drought that prevailed over most of Texas during 1956, there was a general decline in crop and livestock production. Total acreage harvested in Texas in 1956 was 24,500,000, according to the October estimate of the U.S. department of agriculture. On basis of

Table I.—Leading Agricultural Products of Texas

Crop	Indicated, 1956	1955	Average, 1945-54
Cotton lint, bales	3,460,000	4,039,000	3,518,000
Cottonseed, tons	1,557,000	1,817,550	...
Corn, bu.	25,528,000	48,288,000	44,209,000
Wheat, bu.	28,275,000	14,326,000	50,722,000
Oats, bu.	21,998,000	23,590,000	27,090,000
Barley, bu.	2,480,000	2,072,000	2,040,000
Sorghum grain, bu.	93,480,000	148,309,000	82,103,000
Rye, bu.	184,000	124,000	244,000
Rice, 100-lb. bags	10,841,000	14,880,000	11,837,000
Flaxseed, bu.	95,000	96,000	911,000
All hay, tons	1,541,000	2,261,000	1,660,000
Irish potatoes, 100-lb. bags	1,286,000	1,760,000	1,474,000
Sweet potatoes, 100-lb. bags	594,000	1,914,000	1,397,000
Peanuts, lb.	88,550,000	239,235,000	252,600,000
Peaches, bu.	575,000	30,000	936,000
Pecans, lb.	27,500,000	38,000,000	30,565,000
Grapefruit, boxes	3,500,000	2,200,000	11,980,000
Oranges, boxes	2,300,000	1,600,000	2,946,000

Source: U.S. Department of Agriculture.

the first six months, crop cash income for 1956 was \$809,000,000; cash income from livestock, \$771,000,000; total, \$1,580,000,000. This was a decline from \$1,822,956,000, total cash farm income for 1955 in Texas. The total number of farms and ranches in Texas (census of 1954) was 292,946, a decrease from 331,567 in 1950.

The number and value of livestock on farms, Jan. 1, 1956, were as follows: all cattle, 8,586,000, valued at \$609,606,000; hogs, 1,100,000, valued at \$16,060,000; sheep, 5,208,000, valued at \$56,561,000; goats, 2,775,000, valued at \$19,425,000; horses and mules, 298,000, valued at \$13,410,000; chickens, 15,335,000, valued at \$15,335,000; turkeys, 375,000, valued at \$1,725,000.

Manufacturing and Industry.—Employment in Texas, except agriculture, in Aug. 1956, was 2,901,500, of which 533,300 were employed in manufacturing, according to the Texas Employment commission. This was a slight increase over the corresponding figures for Aug. 1955. Outstanding individual events of the year were the placing of several new large chemical industries in the gulf coast country and developments in the metropolitan area between Dallas and Fort Worth. (S. McG.)

Table II.—Principal Industries of Texas

	All employees, 1954	Salaries and wages 1954 (in 000s)	Value added by mfr., 1954 (in 000s)	Value added by mfr., 1953 (in 000s)
Food and kindred products	68,652	\$230,681	\$534,050	\$498,226
Textile mills	8,577	22,049	32,899	...
Lumber and products, except furniture	20,931	48,700	76,353	94,225
Paper and allied products	7,811	32,651	65,445	54,607
Chemicals	37,289	181,448	725,247	777,092
Petroleum	41,639	221,099	474,590	542,104
Primary metals	22,231	98,315	200,060	181,124
Fabricated metals	18,692	75,554	131,474	106,836
Machinery (except electrical)	31,891	144,089	314,791	275,975
Electrical machinery	5,229	21,094	38,181	...
Transportation equipment	57,161	271,362	367,261	366,391
Instruments and related products	1,927	6,707	16,503	21,850
Apparel, related products	30,123	64,420	100,912	103,189
Printing and publishing	22,667	86,869	157,661	156,928

Source: U.S. Department of Commerce, 1954 Census of Manufactures, preliminary report.

Table III.—Mineral Production of Texas

(In short tons, except as noted)

Mineral	Quantity 1953	Value 1953	Quantity 1954†	Value 1954†
Total		\$3,647,913,000		\$3,726,787,000§
Cement (bbl.)	19,140,000	48,498,000	21,928,000	56,674,000
Clays	2,371,000	4,679,000	2,401,000	7,002,000
Coke*	752,000	...	1,056,000	...
Gypsum	1,068,000	2,861,000	1,218,000	3,773,000
Helium (000 cu. ft.)	104,000	1,389,000	111,000	1,874,000
Iron ore	1,137,000	...	987,000	...
Lime	476,000	4,381,000	547,000	5,422,000
Natural gas	(000 cu. ft.)	4,383,158,000	333,120,000	4,551,232,000
Natural gasoline	(000 gal.)	2,750,000	200,479,000	2,732,000
Petroleum (bbl.)	1,019,164,000	2,777,900,000	974,275,000	2,768,490,000
Petroleum gases	(000 gal.)	2,778,000	109,131,000	2,984,000
Salt	2,845,000	5,011,000	2,864,000	9,310,000
Sand and gravel	15,101,000	12,846,000	26,316,000	24,841,000
Stone	9,095,000	8,550,000	24,982,000	28,485,000
Sulphur	4,049,000	97,601,000	3,891,000	92,792,000
Sulphur, recovered elemental . . . . .	...	2,202,000	...	2,889,000
Talc and soapstone	16,000	71,000	19,000	128,000
Other minerals . . . . .	...	39,194,000	...	48,709,000

*Values for processed materials are not included in the totals.

†Values included with other minerals.

‡Preliminary.

§Total has been adjusted to eliminate duplication in the value of clays and stone.

Source: U.S. Bureau of Mines.

Mineral Production.—Table III shows the tonnage and value of those minerals produced in Texas in 1953 and 1954 whose value exceeded \$100,000. In 1954 Texas produced all the U.S. commercial output of magnesium metal. It was far in the lead in output in bromine, natural gas, crude petroleum and sulphur; it had the third largest output and shipments of cement and output of asphalt; and it was fourth in output of bentonite, lime, salt, and sand and gravel and fifth in stone output. Texas has the only commercial production of helium in the world. It also has the only tin plant in the U.S.—the government-owned tin smelter at Texas City. In 1954 Texas was first among the states in the value of its mineral output, with 25.37% of the U.S. total.

Textile Industry. Consumption of the four major textile fibres (cotton, wool, silk and the man-made fibres) in the United States from 1953 through the first half of 1956 is shown in Table I.

During the first half of 1956, fibre consumption was at an annual rate of 6,686,000,000 lb. or at about the same level as the previous year. In comparison, 1939 consumption was 4,500,000,000 lb.

Cotton represented 68% of the poundage of all fibres consumed during the first half of 1956, compared with 66% in 1955 and 69% in 1954. The share of the market held by raw wool remained between 6% and 7% of the total. Use of man-made fibres grew from 24½% in 1954 to 27½% in 1955, but during the first

Table I.—United States Fibre Consumption

(In millions of pounds)

	1953	1954	1955	1st half 1956
Raw cotton	4,521	4,125	4,386	2,259
Raw wool*	504	390	428	238
Apparel class	368	275	296	162
Carpet class	136	115	132	76
Raw silk	5	6	7	4
Man-made fibres†	1,501	1,485	1,851	842
Rayon plus acetate	1,222	1,156	1,419	617
Noncellulosic‡ . . . . .	...	...	355	181
Textile glass	279	329	77	44
Total, four fibres	6,531	6,006	6,672*	3,343

*Scoured basis. †U.S. producers' domestic shipments plus imports for consumption. ‡Includes nylon, acrylic, dinitrile, polyester, polyethylene, polystyrene, polyvinyl-acetate, protein, saran, tetrafluoroethylene and miscellaneous fibres.

half of 1956 it decreased to 25% of the total. Silk consumption remained nominal at less than 1% of the four fibre total.

Prices.—The Sept. 1956 price of raw wool (scoured basis, at Boston, Mass.) was \$1.38 a pound, marking an increase from the low level of \$1.28 per pound in April 1956.

Table II.—Selected Textile Prices in the United States*
(In cents per pound)

Annual Averages	Raw Cotton	Raw Wool	Raw Silk	Rayon Yarn	Rayon Staple
1950	36.2	199.2	349.4	73.2	36.1
1951	41.4	270.5	480.5	78.0	40.0
1952	38.8	165.3	515.6	78.0	39.7
1953	33.0	172.9	529.5	78.0	35.0
1954	34.1	170.6	492.0	78.0	34.0
1955	33.6	142.1	459.4	82.0	33.7
1956†	34.4	131.4	447.9	85.8	32.0

*Cotton is the 10-market spot price for 1³/₁₆-in. middling cotton, through 1954; beginning with 1955, the 14-market price is shown. Wool is fine-grade territory wool, scoured basis, at Boston, Mass. Silk is the 20-22 AA grade. Rayon yarn is 150-denier viscose rayon yarn. Rayon staple is 1¹/₂-denier, 1¹/₂-in. bright viscose rayon staple. †First nine months of 1956 for all prices except silk, which is a seven-month average.

The Sept. 1956 cotton price was 31.9 cents a pound, a decline from the year's high of 35.5 cents reached in the second quarter, despite the fact that the 1957 cotton crop was expected to be the smallest since 1882. The main reason for the decline was a decrease in the Commodity Credit corporation's loan rate from 90% to 82¹/₂% of parity.

For the first three quarters of 1956, the prices of both rayon and acetate staple remained at 32 cents a pound; the rayon staple price was reduced from 34 cents and the acetate staple price from 37 cents a pound late in 1955. In Jan. 1956, the price of 150-denier rayon filament yarn was raised to 86 cents a pound from the previous price of 82 cents established in March 1955.

Broad Woven Goods.—Table III outlines the production of cotton, woollen and worsted, man-made fibre and silk broad woven fabrics, the largest fibre consuming branch of the textile industry, for 1953 through the first half of 1956. Production

Table III.—Broad Woven Goods and Tire Cord Production

	1953	1954	1955	1st half 1956
Broad woven fabrics (millions of linear yards)				
Cotton fabrics	10,203	9,773	10,100	5,345
Man-made fibre fabrics*	2,405	2,245	2,573	1,197
Woollen and worsted fabrics†	338	278	310	172
Total	12,946	12,296	12,983	6,714
Tire cord and fabric (millions of pounds)				
Cotton (except chafer fabric)	16	13	16	6
Nylon‡	18	30	50	31
Rayon	430	324	406	181
Cotton chafer fabric	57	47	51	23
Total	521	414	523	241

*Including silk. †Excluding carpets, rugs and felts. ‡For the first half 1956 includes 2,500,000 lb. of other man-made fibre tire fabrics, including chafer.

during the first half of 1956 was at an annual rate of 13,428,000,000 yd., an increase of 3¹/₂% over the 1955 total.

Through the first six months of 1956, tire cord and fabric production was at an annual rate of 482,000,000 lb., a decline of 8% from 1955 and 20% below the all-time record set in 1951. For several years, high tenacity rayon represented the bulk of the yarn used; however, the use of nylon had increased from 4,000,000 lb. in 1951 to a 1956 annual rate of 62,000,000 lb.

Per Capita Fibre Consumption.—Civilian per capita consumption of cotton, wool and the man-made fibres in the first half of 1956 was at an annual rate of 36.1 lb., a decline of 0.3 lb.

Table IV.—U.S. Civilian Per Capita Consumption of Certain Textile Fibres
(In pounds)

Year	Total	Man-made	Wool	Cotton
1950	40.4	9.2	4.4	26.8
1951	36.4	8.5	2.6	25.3
1952	34.9	8.5	3.1	23.3
1953	36.2	8.6	3.4	24.2
1954	32.5	8.2	2.6	21.7
1955	36.4	10.3	2.9	23.2
1956*	36.1	9.1	3.2	23.8

*First half 1956 data multiplied by two to determine the annual rate.



MINIATURE LOOM designed by a textile manufacturing concern in 1956 to weave samples of new fabrics for distribution to buyers and customers. The machines are scale models of the large looms used in the factory

or 1% from the 36.4 lb. consumed in 1955, as shown in Table IV. Cotton consumption was at a 1956 annual rate of 23.8 lb., an increase of 2¹/₂% over 1955, and wool usage was running at the rate of 3.2 lb. per year, a gain of 10¹/₂%. The 1956 consumption rate for the man-made fibres of 9.1 lb. per year was 1.2 lb. or 11¹/₂% below the record high of 10.3 lb. established in 1955.

Imports and Exports.—During the first half of 1956, the annual rate of United States exports of all textile fibres and manufactures exceeded imports by a narrow margin, the exports being valued at \$1,131,000,000 and the imports at \$1,073,000,000. While the United States is traditionally a net exporter of textile fibres and products, mainly raw cotton, cotton textiles and non-cellulosic man-made fibres, the 1956 export balance of \$58,000,000 was smaller than in any recent year; for example, the export balance was \$110,000,000 in 1955 and \$621,000,000 in 1954.

While the United States is traditionally a net importer of raw wool and manufactured wool textiles, an additional important 1955 import item was rayon staple. There were 172,000,000 lb. valued at \$46,000,000 imported that year.

Canadian Textile Developments.—During 1955, the Canadian textile industry experienced a general improvement over the low levels of the previous year, and a higher volume of business was maintained in some sections of the industry on into 1956.

As one measure of the increased activity, the textile industry working force in mid-1956 numbered about 83,000 persons, compared with 77,000 two years earlier. Further, retail apparel sales had been on the uptrend through mid-1956, rising between 6% and 10% over the same period of 1955. Another favourable factor was the relative stability of textile raw material prices through midyear. In contrast to the general level of consumer textile business done, however, Canadian mills were experiencing difficulty in maintaining their share of the market because of increasing imports of foreign textiles and apparel.

This problem showed up particularly in the man-made fibre section of the textile industry. Man-made fibres accounted for about 27% of all fibres consumed in 1955, and there were about

18,000 workers in the industry. In spite of an increase in man-made fibre fabric usage from 84,000,000 yd. in 1954 to 93,000,000 yd. in 1955, the share of this business done by Canadian mills declined from 75% in 1954 to 73% in 1955. This trend continued in 1956.

(See also LINEN AND FLAX; SILK; WOOL.) (S. B. H.)

Thailand

(SIAM). A kingdom of southeastern Asia, Thailand is bounded west and northwest by Burma, north-east and east by Laos and Cambodia and south by Malaya. Area: 198,270 sq.mi. Pop.: (1947 census) 17,442,689; (1956 est.) 20,686,000. Language: Thai (Siamese) 74%; Chinese 20%; Indian and Malayan 6%. Religion (1947 est.): Buddhist 95%; Moslem 4%. Capital (1947 census): Bangkok 620,830. Ruler, King Phumiphon Adundet (or Bhumibol Aduladej); prime minister in 1956, Marshal Pibul Songgram.

History.—During 1956 Thailand modified somewhat the rigidity of its attitude to the communist countries. This was partly because during the first half of the year the country had an unfavourable balance of visible trade amounting to 460,000,000 bahts. It was announced in May that the Thai legation in Moscow and the Soviet legation in Bangkok would be raised to the status of embassies as from June 1, and the Soviet government put forward a proposal for increased trade between the two countries. On June 21 the government announced the lifting of the ban on the export of nonstrategic goods to China. A new trade arrangement with Japan was also signed on April 9.

The prime minister, Marshal Pibul Songgram, stated on March 9 that his government had requested the United States to convert part of their defense aid into economic aid. A total of more than \$34,000,000 in aid was agreed upon through the U.S. International Cooperation administration in the fiscal year to June 30. This aid was devoted to a number of purposes of which road building was one of the more important. On March 13 U.S. Secretary of State John Foster Dulles and Prince Wan Waithayakon, the foreign minister, signed an agreement by which the United States was to provide Thailand with an atomic reactor for experimental purposes. The first Australian aid under the Colombo plan was received in September.

Despite the movement toward a less openly committed position in international politics, Thailand continued to be an active partner in the South East Asia Treaty organization and on Feb. 6 invited all the signatories of the treaty to participate in manoeuvres known as Exercise "Firm Link." This exercise took place on Feb. 15, 16 and 17 and Thai, U.S., Australian, British, Filipino and New Zealand forces took part. Thailand also continued to play a part in the United Nations and Prince Wan Waithayakon was elected president of the general assembly on Nov. 12.

The program introduced during 1955 to liberalize political affairs appeared to come to a standstill early in 1956. A bill to lower the qualifying age for candidates for election to the assembly from 30 to 20 met strong resistance in the prime minister's own party and on Feb. 21 the government introduced a ban on public gatherings. At the same time members of a party of Siamese who had returned from a visit to China were arrested. On May 11, however, Marshal Pibul stated that the government was considering a plan for more local self-government. There were changes in the cabinet in April; Marshal Phin Chunhawan, the minister of agriculture, was relieved of his position as deputy prime minister and was succeeded in this position by Lieut. Gen. Banyat Devahastin, who ceased to be minister for industry, being succeeded by his deputy, Maj. Gen. Pramarn Adireksarm.

Education.—Schools: state primary (1954) 19,331, pupils (including secondary, June 1953) 3,264,499, teachers (including secondary, June 1953) 93,597; state secondary (1954) 267, pupils 96,300; pupils at private

secondary schools 110,797; vocational (1954) 194, pupils 40,093, teachers 2,059. Institutions of higher education (1954) 12, including 5 universities, students 21,050, teaching staff 711.

Finance and Banking.—Monetary unit: baht or tical, with a buying rate of 20.73 baht to the U.S. dollar and a selling rate of 20.89 baht to the U.S. dollar (April 1956). Budget (1955 est.): revenue 4,180,000,000 baht, expenditure 5,416,000,000 baht; (1956 est.) revenue 4,752,500,000 baht, expenditure (ordinary) 4,647,500,000 baht, (capital) 1,265,900,000 baht. Currency circulation (Dec. 1954) 6,058,000,000 baht, (Dec. 1955) 6,915,000,000 baht. Deposit money (Dec. 1954) 1,511,000,000 baht, (Dec. 1955) 1,739,000,000 baht. Gold and foreign exchange (March 1955) U.S. \$294,000,000, (March 1956) U.S. \$308,000,000.

Foreign Trade.—(1955) Imports 7,201,000,000 baht, exports 6,521,000,000 baht. Chief exports (1955): rice 44%; rubber 25%; tin 6%.

Transport and Communications.—Roads (1954) 7,520 km. Motor vehicles in use (1953): passenger 20,832; commercial (including buses) 21,295. Railways (1954) 3,354 km.; passenger-km. (1954) 2,349,000,000; freight, ton-km. (1955) 777,600,000. Shipping (1953): merchant vessels of 500 gross tons and over 10, gross tonnage 13,900. Air transport (1955): 49,656,000 passenger-km.; freight, 1,281,600 ton-km. Telephones (Jan. 1955) 9,420. Radio receiving sets (1954) 108,000.

Agriculture.—Production (metric tons, 1955; 1954 in parentheses): rubber (exports) 132,300 (119,600); rice 7,711,000 (5,709,000); soybeans 20,000 (22,000); sesame 11,200 (9,900); peanuts 94,000 (92,000); cotton, lint 8,000 (9,000); cottonseed 14,000 (15,000); sugar, crude brown 30,000 (30,000); tobacco (1954) 52,600, (1953) 49,800; teak (1954) 408,002 sq.m. Livestock (1953): cattle 5,548,734; buffaloes 5,402,210; pigs 3,327,281; horses 213,868; elephants 12,695; poultry 46,061,371. Fish landings (metric tons, 1954): 251,800.

Industry.—Production (1955): electricity (Bangkok only) 189,600,000 kw.hr., (Bangkok and Thonburi, 1954) 196,124,307 kw.hr.; tin concentrates (metal content) 11,160 metric tons; cement 386,400 metric tons; tungsten ore (metal content, 1954) 718 metric tons. Estimated cotton cloth output (1954): 40,000,000 yd. (A.S.B.O.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Thailand* (1955).

Theatre. The 1955–56 season proved the most prosperous one that the theatre in the United States had enjoyed since the end of World War II, the trade weekly, *Variety*, reporting that the Broadway stage and its touring companies accumulated a total gross of \$58,000,000 during the year.

But while the war era saw the constant production of much shoddy fare to meet the indiscriminating tastes of the entertainment-hungry, the 1955–56 season was one of relatively high artistic values. Many good plays had lengthy engagements. *My Fair Lady*, a handsome and witty musical comedy version of G. B. Shaw's *Pygmalion*, became an enormously popular hit, and the off-Broadway groups found eager audiences for their revivals of Anton Chekhov, Eugene O'Neill and Bert Brecht.

Extremely high production costs and the shortage of Manhattan playhouses remained the New York theatre's most pressing problems, and as a result of the scramble for stage space two of the year's most interesting offerings—Tyrone Guthrie's mounting of Christopher Marlowe's *Tamburlaine the Great*, with Anthony Quayle as the barbaric Asian conquerer, and Sean O'Casey's drama of the 1913 dock strike in Dublin, *Red Roses for Me*, a work rich in poetic beauty—were forced to withdraw after brief runs.

No new native play of important stature appeared on the scene, but O'Neill's last work, an autobiographical tragedy concerning its author's unhappy youth, *Long Day's Journey into Night*, was published after receiving its world première at the Royal Dramatic theatre in Stockholm (Feb. 1956) and was announced for U.S. production during 1957.

The Diary of Anne Frank, by Frances Goodrich and Albert Hackett, based on the journal of an adolescent girl done to death in a German concentration camp in 1944 which told of the plight of a Jewish family hiding in an Amsterdam attic during the Nazi occupation, won both critics and public, thanks to a moving presentation directed by Garson Kanin and acted by Susan Strasberg as the young daughter and Joseph Schildkraut as the hunted father.

There was only light applause and a short engagement for Arthur Miller's double-bill, *A View From the Bridge*, two short dramas of New York waterfront life, but Tennessee Williams' *Cat on a Hot Tin Roof*, William Inge's *Bus Stop*, and *Inherit the Wind* by Jerome Lawrence and Robert E. Lee—all held over

from the previous season—continued to draw playgoers. The television writer Paddy Chayevsky, author of *Marty*, wrote a comedy, *Middle of the Night*, about a middle-aged, middle-class businessman who falls in love with a lady 25 years his junior, and Edward G. Robinson, returning from the motion pictures, enacted it realistically. The subject matter of two of the new plays—*A Hatful of Rain*, a study of narcotic addiction, and *Time Limit*, which studies some brain-washed soldiers—attracted discussion, though the plays themselves were not of the first order.

Virtually all the new comedies seemed to have had stars in mind. *The Great Sebastians*, a Howard Lindsay-Russell Crouse melodrama of the comic adventures of a vaudeville magician and his wife behind the "iron curtain," served Lynn Fontanne and Alfred Lunt as a popular vehicle; Margaret Sullavan, Robert Preston and Claude Dauphin bolstered *Janus*, a sort of Palais-Royal triangle farce written by an American, Carolyn Green; David Wayne, assisted by a promising young actress, Sarah Marshall, charmed audiences with his humorous characterization of a weak-minded but engaging southern gentleman accused of murder in *The Ponder Heart*; Shirley Booth rescued the feeble *Desk Set*; and Thornton Wilder tailored a 100-year-old Viennese farce by Johann Nestroy, *The Matchmaker*, to suit the effusive talents of Ruth Gordon.

George Axelrod's *Will Success Spoil Rock Hunter?*, though starless, had to do with the Hollywood star-makers, and *No Time for Sergeants*, a cartoon of an amiable hillbilly undergoing basic military training, made a star of Andy Griffith, who played the out-of-order rookie.

Several hits came from abroad. The Comédie Française undertook its first U.S. tour in its 300-year history, playing in repertory the classic comedies of Molière. Marivaux and Beaumarchais. *Tiger at the Gates*, Christopher Fry's version of Jean Giraudoux's *La Guerre de Troie n'aura pas lieu*, arrived with the British actor Michael Redgrave in the leading role and repeated its London success on Broadway. Lillian Hellman's free adaptation of Jean Anouilh's St. Joan play, *The Lark*, was another hit of Gallic origin, and in it Julie Harris as the Maid and Christopher Plummer as Warwick contributed two of the season's outstanding performances.

Another Parisian visitor was Marcel Marceau, the extraordinary French mime, whose one-man show of pantomime playlets caught the public fancy and was repeated to great acclaim on television.

From England came Enid Bagnold's comedy about an eccentric country household, *The Chalk Garden*, memorable for its good dialogue and the acting of Gladys Cooper and Siobhan McKenna (who later in the year scored a tremendous personal success in a revival of Shaw's *Saint Joan*). Noel Coward's 1925 parlour piece, *Fallen Angels*, was revived with Nancy Walker and Margaret Phillips, and the D'Oyly Carte Opera company returned with its ever-welcome repertory of Gilbert and Sullivan.

Ugo Betti's strange Italian sex play, *Island of Goats*, was an immediate failure, but Samuel Beckett's *Waiting for Godot*, in which two tramps waited wistfully and in vain for an answer to life's mysteries, was well received, and there was much praise



SCENE FROM *LONG DAY'S JOURNEY INTO NIGHT* by the U.S. playwright Eugene O'Neill, who wrote the play in 1940 but forbade any production until after his death. The play opened in Stockholm, Sweden, in 1956

for Bert Lahr, who appeared as one of the talkative vagrants. The musical-comedy stage in the United States had one of the greatest hits in its history when *My Fair Lady* opened. Based on Shaw's *Pygmalion*, the book by Alan Jay Lerner managed to retain the Shavian wit and spirit, and a melodious score was supplied by Frederick Loewe, while Cecil Beaton contributed some sumptuous costumes and Oliver Smith some stunning sets. Rex Harrison as the woman-hating phonetics professor, Julie Andrews as the Covent Garden flower girl whom he transforms into a lady, and Stanley Holloway as the cockney father were perfect, and how to obtain tickets to *My Fair Lady* became a national problem.

More pretentious but less satisfying was Frank Loesser's *The Most Happy Fella*, an attempt to make a baby-grand opera out of Sidney Howard's old play *They Knew What They Wanted*; and *Pipe Dream*, a Richard Rodgers-Oscar Hammerstein II dramatic musical suggested by a John Steinbeck novel, proved a grave disappointment.

Of the off-Broadway ventures, a revival of O'Neill's *The Iceman Cometh* at the Circle-in-the-Square and a revival of Kurt Weill and Bert Brecht's *Threepenny Opera* at the Theatre de Lys were the most notable. (T. Q. C.)

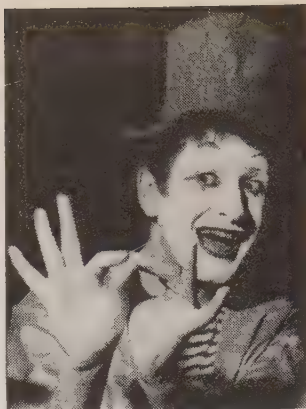
Canada.—Canada's booming economy and general sense of prosperity was shared by the theatre throughout 1956, with players, producers, stagehands, musicians, landlords and all the rest enjoying the sense of well-being. Of greatest interest was the Stratford Shakespearean festival's decision to scrap the famous

Statistics of the Theatre in New York City

	Season* 1955-56	Season* 1954-55	Season† 1927-28
Productions	95	74	302
Musical comedies.	37	21	69
Plays	58	53	233
Premières.	47	50	255
Successful productions.	39	26	66
Performers employed	2,047	1,358	6,621
Tickets sold	8,301,500	6,890,000	
Approximate cost of production.	\$4,600,000	\$4,350,000	
Number of shows booked for other cities	61	56	

*The theatrical season is considered to begin Aug. 1 and end July 31.
†The peak season on Broadway.

3½-ton tent (to which 400,000 customers were attracted in three short summer sessions) and to build a permanent structure at a cost of \$1,500,000. A public campaign to raise the required money was well under way by the end of the year and the 1957 season (starring Christopher Plummer in *Hamlet*) was advertised for the new, uncompleted building in July. More than 140,000 people paid \$472,000 to see the Stratford presentation of *Henry V*, *Merry Wives of Windsor* and *Oedipus Rex* in 1956. Postseason work for the players included an engagement at the Edinburgh festival and tours of Canada and the U.S.



MARCEL MARCEAU, French pantomimist who enjoyed a successful tour of U.S. theatres and night clubs in 1956

Canada's other national-interest theatre activity, the Dominion Drama festival, was held at Sherbrooke, Que., in May, with eight amateur companies performing throughout a week before packed houses. The adjudicator, Madame Francoise Rosay, noted Parisian actress and director, awarded the top honours to the University of Toronto Alumni Drama society's production of Patricia Jourdray's *Teach Me How to Cry*. It was the first time a full-length play written by a Canadian had won. In October it was announced that the 1957 festival would be held in the new \$4,000,000 Jubilee auditorium in Edmonton, Alta., with Robert Speaight, London actor and producer, as adjudicator.

Summer stock theatre continued to grow in importance as a part of the Canadian scene. Newly renovated rural premises, offering well-known stars in lead roles of sure-fire hits, attracted an all-time record box office. University drama groups showed notable development during the year, with several alumni societies winning important competitive honours. The emergence of several new Canadian (post-World War II immigrant people) theatre groups, presenting plays in their mother tongues and in the English or French of their new homeland, was a matter of interest, and all the specialty theatre organizations, e.g. the Montreal Yiddish theatre and the Children's theatre in Regina, Sask., enjoyed a successful year. Vancouver's Theatre Under the Stars, a well-established west coast institution, had its best season, and live theatre in the oil-boom cities of Edmonton and Calgary, in Alberta, received wide public support. (WR. B. H.)

Great Britain.—Although a few of the provincial repertory theatres reported good business during 1956, the picture of the theatre outside London could hardly be called bright. Television had dimmed the lights everywhere. In London it was one of the least interesting winter seasons in memory and from October to February no new British play of note was mounted in the West End. *Lucky Strike*, a matinee or woman's play about factory feuds, made a poor showing beside the strident American musical comedy on a somewhat similar theme: *The Pajama Game*. *The Queen and the Rebels* by Ugo Betti made an impression as a neo-Galsworthian drama of much striking power and Irene Worth's performance in the lead was applauded.

On the other hand, a 20-yr.-old sensation from Germany, the Kurt Weill and Bert Brecht version of *The Beggar's Opera* (*Die Dreigroschenoper*), made a belated hit in London as *The Threepenny Opera*; though its nihilistic message was felt particularly inappropriate to the welfare state era, its sleazy humour and tunes ensured a transfer of the piece from the outlying Royal Court theatre to the West End. At that theatre, after a dubious start, theatrical history was once more in the making. The English stage

company, under the direction of George Devine, was promoting a "writer's theatre," on the analogy of the author's theatre which Bernard Shaw and Granville Barker had set in opposition to the dominant actor-manager's theatre at the turn of the century on the same stage. Celebrations of the Shaw centenary were thin and inadequate. Two novelists of repute, Angus Wilson with *The Mulberry Bush* and Nigel Dennis with *Cards of Identity*, scored near successes.

Arthur Miller's antiwitch-hunting play—*The Crucible*—was a third choice for this repertory company and its biggest success—or most controversial novelty—was *Look Back in Anger* by a youthful and, at the time, unemployed actor John Osborne. The piece had more in it than mere scandal value. Probably the best English comedy of this or some other years was Enid Bagnold's *The Chalk Garden* which came to England by way of the United States where it was first recognized for its high-mettled merits and lapidary dialogue. The social wit and light-fingered allegorical flourishes of the play drew from Dame Edith Evans and Dame Peggy Ashcroft, as *chatelaine* and *governess* respectively, performances of great brilliance, seen to be all the more rare when the parts passed into other hands.

Hotel Paradiso, Georges Feydeau's almost classically Parisian farce of a wild night in a low hotel, had a dazzling Chaplinesque performance by Alex Guinness, décor by Osbert Lancaster and production by Peter Glenville which had the speed of an old silent film. A strong comedy of a rather charade-like type was Peter Ustinov's *Romanoff and Juliet*, a comedy of crossed love in embassies. A revue which touched some new fields of macabre, whimsical humour was called *Cranks* after John Cranko, the choreographer. It set a vogue. Jean Anouilh's *The Waltz of the Toreadors*, a scabrous continuation of the misadventures of the lustful general which had been begun in *Ardèle* (not a success in London), caught attention with striking performances by Hugh Griffith and Beatrix Lehmann. The garrulous audacity of the writing kept it running all summer. Two U.S. plays did well in London: *The Caine Mutiny Court-Martial*, already seen on film there, and *The Rainmaker*.

Thrillers were unimportant. The Watergate Theatre club, resuscitated to get around the censor's ban on certain outspoken plays from the United States, represented the largest membership theatre ever known at the Comedy theatre where three U.S. successes, *A View From the Bridge*, *Cat on a Hot Tin Roof* and *Tea and Sympathy* were due for production.

At the Old Vic the playing and production, under Michael Benthall's direction, were on the whole thin, though both Richard Burton and John Neville enhanced their reputations. The best production was Tyrone Guthrie's audaciously witty dressing of *Troilus and Cressida* in the costumes of Europe on the eve of World War I.

Europe.—The Paris Festival of Drama brought together striking examples of current work from the Balkans, Scandinavia, the United States and many other lands, though England was none too well represented by provincial Shakespeare and the usual Theatre Workshop productions. The Milan company Il Piccolo Teatro, showing such works as Carlo Goldoni's *Arlecchino: Servant of Two Masters* and Luigi Pirandello's *Tonight We Improvise* (which were brought to the Edinburgh festival), established Giorgio Strehler as a brilliant director and put the Italian theatre back on the map of Europe.

Jean Vilar with his Théâtre National Populaire also made converts to the new French style in Europe (while Jean-Louis Barrault was touring the Marigny company across the Atlantic). Maria Casares in Victor Hugo's absurd but oddly exhilarating *Marie Tudor* was among the best offerings of the company. The most significant of theatrical peregrinations was that of the Berliner Ensemble, the state-aided theatre of Bert Brecht. The long

pantomimic version of *The Caucasian Chalk Circle* and the now no longer new *Mother Courage* had their effect. While this eastern German company had been infiltrating the west, western German theatres were being largely a clearinghouse for British and U.S. successes in translation. Among these, not without piquancy of situation, was *The Diary of Anne Frank*, with its powerful anti-Nazi, pro-Jewish line. Paris too was full of plays translated from the English. Here interest also centred on the vogue of M. E. Ionesco's "nonsense" plays which beg all the accepted conventions of the drama. Jean Anouilh's *Ornifle*, André Roussin's *L'Amour fou* and Armand Salacrou's *Histoire de Rire* were typical creations of their authors and deserve mention to preserve the perspective in any picture of the French theatre.

(P. H.—WE.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Curtain Time* (1950).

Thermonuclear Weapons: see ATOMIC ENERGY.

Thomas, Charles S. (1897—), U.S. secretary of the navy, was born on Sept. 28 at Independence, Mo. He studied at the University of California and at Cornell university, Ithaca, N.Y., from 1916 to 1918 but did not receive a degree. He later moved to Los Angeles, Calif., becoming a successful business executive there. Appointed under-secretary of the navy by Pres. Dwight D. Eisenhower, he was confirmed by the senate on Feb. 6, 1953, and served until August, when he took office as assistant secretary of defense for supply and logistics. In this position he assumed charge of the U.S. program of stockpiling essential defense materials. On March 11, 1954, Thomas was nominated secretary of the navy.

On Oct. 5, 1956, Thomas overruled the findings of a general court-martial ordered by him in the case of a marine staff sergeant, Matthew C. McKeon, accused of leading an unauthorized disciplinary march at Parris Island, S.C., that resulted in the drowning of six marine recruits April 8, 1956. Thomas specifically cancelled McKeon's bad-conduct dismissal from the marines, reduced his sentence from nine months to three, and revoked a \$270 fine imposed on McKeon by the military court.

Thomas, Norman (Mattoon) (1884—), six times candidate for president of the United States on the Socialist party ticket, lecturer and writer, was born at Marion, O., Nov. 20, the son of Welling Evan Thomas, a minister of the Presbyterian Church. After graduating from the Marion high school and spending a year at Bucknell university, he went to Princeton university, from which he graduated in 1905. He later attended Union Theological seminary, New York city, from which he graduated in 1911 and became pastor of the East Harlem church, in one of the city's poorer sections.

Thomas' first activity in Socialist political campaigns was in 1917, when he actively supported Morris Hillquit, Socialist candidate for mayor of New York. He was opposed to the entry of the United States into World War I, and he resigned from his pastorate in 1918 and became secretary of the Fellowship of Reconciliation and founder and first editor of the antiwar magazine the *World Tomorrow*.

In 1921 he became a member of the editorial staff of the *Nation*, and the next year was appointed co-executive director of the League for Industrial Democracy, as associate of Harry W. Laidler, which position he held until 1936, later founding and serving as chairman of the Post War World council.

During the period 1924 to 1948 Thomas ran as Socialist candidate for many offices. He was nominated as candidate for president of the United States in 1928, 1932, 1936, 1940, 1944 and 1948, and in other years ran in New York state for governor, mayor, U.S. senator, assemblyman, congressman and other of-

fices. He received his highest vote as presidential nominee—nearly 900,000—in 1932.

During all these years, Thomas lectured extensively before educational and civic groups in all parts of the country; appeared on scores of radio and television programs; was a member of many boards, among them the national board of the American Civil Liberties union; served as a newspaper columnist; and wrote numerous books, pamphlets and articles. Among his publications were *Is Conscience a Crime?*, *America's Way Out*, *What's the Matter With New York?* (coauthor), *Human Exploitation*, *A Socialist's Faith* and *The Test of Freedom*.

During his lifetime he has not held a public office. Yet, in the words of Frank P. Graham, "Many of the things for which he has steadfastly struggled in unsuccessful political campaigns are now a part of the social code and constitutional law of the land." At his 70th birthday in Nov. 1954 men and women of all political and economic faiths paid tribute to his brilliant and dedicated service to his fellow men.

(H. W. L.)

Throat: see EAR, NOSE AND THROAT, DISEASES OF.

Tibet. This is a country of central Asia, north and northeast of the Himalayas, having autonomous status within the People's Republic of China. Area: 469,413 sq.mi. Pop. (1953 census): 1,273,969. Language: Tibetan. Religion: Lamaistic Buddhism. Capital: Lhasa. Ruler, the Ling Erh ("divine child") Pamo Tontrup or Lamu Fankha, the 14th dalai lama.

History.—On April 22, 1956, a preparatory committee of 55 members was formed in Lhasa under the chairmanship of the dalai lama to prepare the constitution of the Tibetan autonomous region of China. The panchen lama was its first deputy chairman and Gen. Chang Kuo-hua, Chinese commander of the Tibetan military district, its second deputy chairman.

Besides the two highways connecting Lhasa with China proper via Lanchow and Chengtu, two others were inaugurated in 1956, one from Lhasa via Gyantse and Shigatse to Gartok in the westernmost area, and another from Gyantse to Yatung in the south,

FIRST PLANE FLIGHT of the Peking, China, to Lhasa, Tibet, air transport service established in 1956. Photograph shows the plane, similar to a U.S. DC-3, over Potala palace, Lhasa



near the Sikkim frontier.

On May 26 the first two-engine aircraft of the Peking-Lhasa air line landed at Lhasa airport, on a trial flight. Three other airfields were being built along the Lhasa-Shigatse-Gartok road.

In May reports from Kalimpong, the Indian frontier town on the main trade route to Tibet via Sikkim, alleged that an anti-Chinese rebellion had started in eastern Tibet. In July these reports were repeated and the Indian press said that about 100 Chinese tanks arrived in Lhasa "to quell any uprising" in the capital. On Aug. 7, in Peking, Liu Ke-ping, chairman of the Nationalities Affairs committee in the National People's congress, told a foreign correspondent that the reports were grossly exaggerated and apparently related to the revolt in Feb. 1956 in the Chamdo area. He admitted that military measures were necessary.

Timber: see FORESTS; LUMBER.

Timor: see PORTUGUESE OVERSEAS TERRITORIES.

Tin. Table I, based on U.S. bureau of mines data, shows an increase in world output of mined tin in 1955. Data on smelter output is given in MINERAL AND METAL PRODUCTION AND PRICES.

Table I.—World Mine Production of Tin

	(In short tons)					
	1950	1951	1952	1953	1954	1955
Australia	2,076	1,746	1,804	1,739	2,216	2,326
Belgian Congo	15,080	15,309	15,450	17,128	16,894	17,139
Bolivia	34,959	37,108	35,794	39,004	32,283	31,272
Burma	1,702	1,568	1,792	1,568	1,064	1,262
China	8,400 [?]	8,400 [?]	9,600 [?]	10,750 [?]	11,200 [?]	12,900 [?]
Indonesia	35,954	34,704	39,203	37,880	40,164	37,372
Malaya	64,441	64,027	63,659	63,004	67,973	68,593
Nigeria	9,249	9,552	9,316	9,215	8,877	8,193
Thailand	11,608	10,642	10,616	11,341	10,949	12,395
United Kingdom . . .	997	942	1,011	1,235	1,053	1,158
Others	5,134	5,702	6,755	8,336	7,627	8,290
Total	189,600	189,700	195,000	201,200	200,300	200,900

United States.—Data given on the U.S. industry is based on U.S. bureau of mines reports. The 1955 tin market was firm.

Table II.—Data of the Tin Industry in the United States

	(In thousands of short tons)					
	1950	1951	1952	1953	1954	1955*
Imports, total	121.9	64.8	119.9	123.3	98.3	95.0
In concentrates . . .	29.2	33.2	29.7	39.8	24.8	22.5
Metal	92.8	31.6	90.2	83.5	73.5	72.5
Smelter output . . .	37.1	35.7	25.5	42.1	30.1	25.0
Secondary recovery . .	35.5	34.4	32.3	30.5	31.2	31.7
Consumption, total . .	117.0	98.7	87.8	95.9	92.9	101.9
Primary	79.7	63.7	50.8	60.4	66.0	66.2
Secondary	37.3	35.0	37.1	35.5	31.9	35.7
Stocks, industry . . .	28.9	23.3	25.6	27.4	26.1	49.8

*Preliminary.

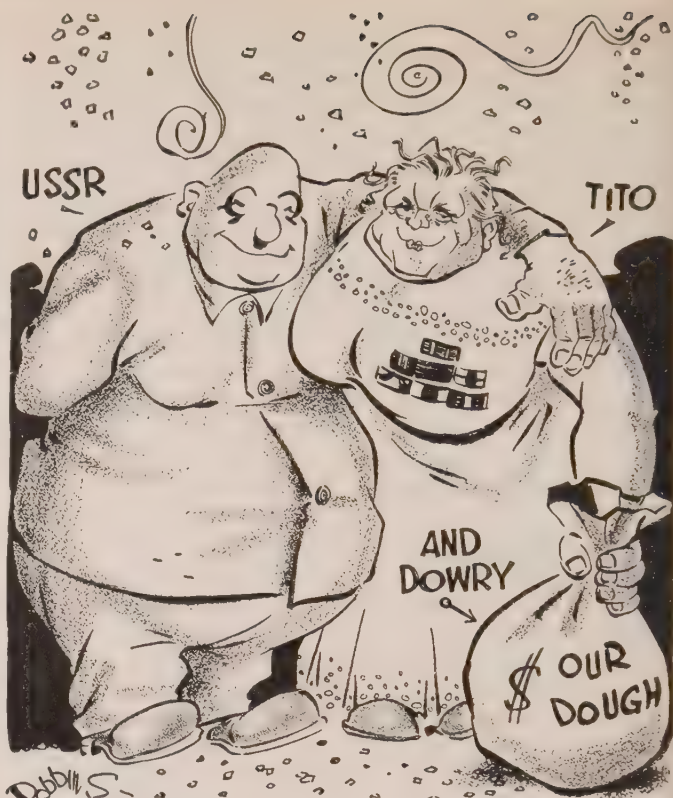
In the first half of 1956, the U.S. industry consumed 34,168 short tons of primary and 17,584 tons of secondary tin which included tin content of imported tin-base alloys. Output of tin produced at the government-owned smelter at Texas City, Tex., was 11,220 tons and pig tin produced at secondary plants was 1,577 tons. Public law 608, approved June 26, 1956, extended the government's authority to operate the Texas City smelter to Jan. 31, 1957, and authorized disposal of the plant.

(F. E. H.; B. B. M.)

Tires: see RUBBER.

Titanium: see MINERAL AND METAL PRODUCTION AND PRICES.

Tito (JOSIP BROZ) (1892–), Yugoslav statesman and soldier, was born at Kumrovec, Croatia, May 25, the son of a blacksmith. He served as a private in the Austro-Hungarian army in World War I and was captured in March 1915 by the Russians. In 1920 he returned to Yugoslavia and was one of the organizers of the Yugoslav Communist party. He was arrested many times, and was sentenced in 1928 to six years' imprison-



"JUST MARRIED AGAIN!" a 1956 cartoon by Dobbins of the *Boston Post* (Mass.)

ment for conspiracy. On his release in 1934 he went to Moscow. In 1936 he was sent to Paris, Fr., where he helped to organize the transport to Spain of volunteers for the international brigades. In 1937 he became secretary-general of the Yugoslav Communist party. After the German attack on the U.S.S.R. he started guerrilla warfare in Yugoslavia. In the first months of 1945 all Yugoslavia was liberated and on March 7, 1945, Tito, who meanwhile had appointed himself marshal, became prime minister and commander in chief. On Jan. 14, 1953, the national assembly elected Tito president of the Yugoslav federation, chairman of the federal executive council and supreme commander of the armed forces.

Tito visited Moscow in April 1945, and during the following two years he paid state visits to the capitals of Poland, Czechoslovakia, Bulgaria, Hungary and Rumania, signing on each occasion a bilateral treaty of friendship and mutual aid. On June 28, 1948, the Cominform published a statement denouncing Tito for his "hateful policy in relation to the U.S.S.R." In June 1950 he proclaimed that Yugoslavia was the only neutral country in the contemporary world. He pursued, however, a qualified approach to the west.

On Nov. 14, 1951, the United States agreed to make available to Yugoslavia equipment, materials and other services. On Feb. 28, 1953, a Graeco-Turco-Yugoslav treaty of friendship and co-operation was signed, which on Aug. 9, 1954, was transformed into a military alliance. On March 16–21, 1953, Tito visited Great Britain. During 1954 he paid official visits to Turkey, Greece and India; in 1955 to Burma and Ethiopia; and in 1956 to Egypt, France, the U.S.S.R. and Rumania. In July 1956 he paid a private visit to King Paul of Greece on the island of Corfu.

On Sept. 27, together with N. S. Khrushchev, on a "private visit" in Yugoslavia, he flew to Yalta, Crimea. Back in Belgrade, he received Erno Gero, first secretary of the Hungarian Communist party (Oct. 15–22), and Gheorghe Gheorghiu-Dej, first secretary of the Rumanian Communist party, and (Oct. 20–28) Chivu Stoica, the Rumanian premier.

Tobacco. Tobacco consumption in the United States in 1956 by persons over 15 years of age was estimated at 11½ lb., slightly lower than in 1955 and the lowest for the post-World War II period. About 9½ lb. was in the form of cigarettes. Approximately 425,000,000,000 cigarettes were produced, 3% more than in 1955 and second only to the record manufacture of 435,500,000,000 in 1952. Domestic use amounted to 395,000,000,000 cigarettes. Cigar consumption increased to 6,300,000,000 units, a gain of 4% over 1954; consumption of smoking and chewing tobacco was the smallest on record. Exports of unmanufactured tobacco, mostly of flue cured, amounted to 576,100,000 lb. valued at \$378,900,000 in 1955-56, the highest value of record and up 25% compared with 454,598,000 lb. valued at \$303,869,000 in the previous year. Cigarettes exported numbered about 15,000,000,000. Supplementary tobacco imports, constituting about 7% of the blend used in cigarettes and 20% to 25% of the tobacco used in cigar manufacture, were a record 115,000,000 lb., 5% above the previous year.

The 1956 total tobacco crop was indicated at 2,124,767,000 lb., 3% lower as compared with 2,195,788,000 lb. in 1955 and an average 1947-51 crop of 2,082,727,000 lb. About 1,380,000 ac. were harvested as compared with 1,497,000 ac. in 1955 and a 1,726,000-ac. average for the previous decade. Tobacco growers participated in the 1956 acreage reserve of the soil bank, earning payments by reducing acreage below the allotment established for the farm; 19,994 agreements were signed covering 31,671 ac. for possible payments of \$6.618,699, based on anticipated yields established for the particular acreage diverted, at rates varying from 8 to 18 cents per pound depending on the type of tobacco. The average yield for all tobaccos was a new record of 1,540 lb. per acre, compared with the previous record 1,467 lb. of 1955 and the 1,236-lb. average for 1945-54.

The flue-cured crop, basic to cigarette manufacture and export supplies, was indicated at 1,384,450,000 lb. The yield was indicated at a new record 1,573 lb. per acre. Auction prices for the first three-fourths of the crop averaged nearly 52 cents per pound, about the same as for a comparable period in 1955, and above the official loan rate of 48.9 cents (90% of parity) per pound. About one-fifth of the crop was put under the official support program. Carry-over stocks were 2,258,000,000 lb. against domestic use of 728,000,000 lb. in 1955-56. Exports were 553,500,000 lb., 29% larger than in 1954-55 and the largest on record.

The air-cured burley crop of 1956 was a light one of 496,113,000 lb. Carry-over stocks were 1,309,000,000 lb. and domestic usage in 1955-56 was 475,000,000 lb., about 10,000,000 lb. below the previous year. The support price was 47.2 cents per pound. Southern Maryland tobacco (type 32), which was voted under acreage allocation and price support for the first time for 1956, 1957 and 1958, was indicated at 42,500,000 lb. Carry-over supplies, a record high of 77,500,000 lb. at the beginning of 1956, were slightly reduced during the year by domestic use of about 26,000,000 lb. and exports of 11,000,000 lb. The average support price on the 1956 crop was 46.2 cents per pound; the unsupported 1955 crop, sold during the early summer of 1956, averaged 50.2 cents per pound as compared with 40.3 cents for the 1954 crop.

Production of fire-cured types (class 2), largely used for snuff, was indicated at 66,907,000 lb. Disappearance in 1955-56 of 64,000,000 lb. was 8% more than in the previous year; nevertheless, carry-over stocks increased slightly to 138,000,000 lb. The support price of 35.4 cents per pound was just under the 37.3 cents per pound average price of the 1955 crop.

Production of dark air-cured and sun-cured types increased to 31,850,000 lb. from 31,068,000 lb. in 1955. Disappearance was less and carry-over stocks increased to 86,000,000 lb. against 81,000,000 lb. in 1955. Prices approximated the support level of

Table I.—U.S. Tobacco Production by Leading States

State	(In thousands of pounds)		
	Indicated 1956	1955	1945-54
North Carolina	801,755	997,395	871,285
Kentucky	344,920	351,226	445,630
South Carolina	154,500	197,200	156,512
Virginia	138,495	162,049	160,720
Georgia	127,485	149,375	117,578
Tennessee	121,180	129,397	145,121
Pennsylvania	47,200	45,725	49,660
Maryland	43,750	35,525	38,469
Florida	29,580	35,094	26,032
Ohio	21,135	21,802	25,693
Connecticut	16,510	20,530	25,402
Wisconsin	16,208	19,345	29,424
Indiana	11,972	11,388	13,639
Massachusetts	7,800	10,740	11,370

Table II.—Tobacco Production of the Principal Producing Countries

Country	(In thousands of pounds)		
	1956-57	1955-56	Average 1947-51
United States	2,124,767	2,195,788	2,082,727
China	1,630,000	1,610,000	1,425,000
India	582,400	546,560	547,150
Japan	332,914	329,799	208,092
Brazil	329,037	311,400	233,120
Pakistan	270,000	262,039	113,883
Turkey	246,355	250,689	194,109
Canada	168,000	134,840	129,445
Greece	167,500	212,854	113,320
Southern Rhodesia	150,000	160,000	84,679
Indonesia	146,174	144,847	62,030
Italy	145,327	136,685	167,900
France	120,702	116,980	109,070

31.5 cents per pound. The total production for all cigar types was 102,792,000 lb. as compared with 110,811,000 lb. in 1955. Stocks of cigar types declined moderately and support prices, ranging between 23.4 and 52.5 cents per pound, depending on type, were generally lower than in 1955.

World tobacco production in 1956 was a new record high of 8,427,908,000 lb. as compared with 8,391,077,000 lb. in 1955 and a prewar average of 6,619,347,000 lb. The struggle for markets became even more acute as reserve stocks were developed in consuming as well as producing countries. Research on tobacco was expanded. Turkey was reported as alarmed at the reluctance of U.S. companies to bid strongly on the 1955 crop. Several trade agreements included tobacco. The United States traded tobacco for 1,500 modern housing units for service families in Great Britain. The United Kingdom, in spite of a duty of more than eight cents per pound on tobacco, continued to be the world's leading importer, and, after the U.S., a major consumer, averaging 7.7 lb. per capita for all persons over 15 years of age.

(J. K. R.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Tobacco and the Human Body* (1954).

Tobago: see TRINIDAD AND TOBAGO.

Togoland: see FRENCH UNION; FRENCH WEST AFRICA; GOLD COAST; TRUST TERRITORIES.

Tonga. (FRIENDLY ISLANDS). Tonga is a kingdom under British protection, exercised through the governor of Fiji and a local British agent. There are three main island groups, Vava'u, Ha'apai and Tongatapu. Total area: 270 sq.mi. (Tongatapu Island 99 sq.mi.). Pop. (Dec. 1954 est.): 54,000, mainly Tongans, racially and linguistically Polynesian with Melanesian admixture. Religion: Christian (77% belonging to three Methodist bodies, including 18% to established Free Church of Tonga). Capital, Nukualofa (pop., 1950 est., 5,500), on Tongatapu. Queen, Salote Tupou; premier in 1956, Crown Prince Tungi; British agent and consul, C. R. H. Nott.

History.—A census of population was held in Sept. 1956. H.M.S. "Telemachus" made a sounding of 34,050 ft. in the Tonga deep, 6,000 ft. lower than any depth recorded on existing charts and within 2,000 ft. of the greatest known oceanic depth. Lord Rowallan, the chief scout, visited Tonga during the year.

(D. W. F.)

Tornadoes: see DISASTERS; METEOROLOGY.

Toronto. The municipality of metropolitan Toronto is situated on the north shore of Lake Ontario, almost opposite the mouth of the Niagara river, 60 mi. N. of Buffalo, N.Y. Area: about 240 sq.mi., pop. (1955 est.) 1,304,363. The metropolitan municipality is a federation of 13 smaller municipalities—three villages, four towns, five townships and the city of Toronto (pop., 1955 est., 681,857), which is the capital of the province of Ontario.

The metropolitan municipality was established Jan. 1, 1954, by the province of Ontario, to deal with certain municipal problems common to the area. Each of the subordinate municipality governments collects two sums of money from the taxpayer. One goes to the metropolitan municipality (and its size is specified in advance by the metropolitan municipality); the other is retained by the subordinate government. The metropolitan municipality has almost complete control over major services, including education, transportation, water, sewers and highways, throughout the whole area; residual powers are retained by the subordinate governments. The metropolitan municipality is governed by a 25-member metropolitan council, consisting of a permanent chairman plus 12 township reeves and village mayors and 12 officials of the city of Toronto, the most important of the subordinate municipalities. In 1956 the chairman of the metropolitan council was Frederick G. Gardiner; the mayor of the city of Toronto was Nathan Phillips.

Between the end of 1951 and the end of 1955, population increase in the Toronto metropolitan area was recorded at 222,903, more than 55,000 a year. The metropolitan municipality was established because almost all this new population was moving into the villages and townships surrounding the city of Toronto, creating demands for services which the financial reserves of these small municipalities were not sufficient to meet. During 1956 delegations from Miami, Chicago, Niagara Falls and other U.S. cities visited metropolitan Toronto to study the workings of the "supergovernment" and the division of responsibilities between it and the local governments.

Since the Toronto metropolitan area is strategically located on one of the most modern harbours of the Great Lakes and is accessible to raw materials, low-cost power and markets for its finished products, it possesses the greatest concentration of diversified industry in Canada. In 1954 there were about 4,600 manufacturing establishments employing approximately 200,000 persons and paying wages of about \$656,000,000. Gross value of production was about \$2,500,000,000.

Metropolitan council estimates for 1956 provided for a gross expenditure of \$73,920,822 (1955 gross figure \$62,528,455) with \$29,453,588 to be met by grants from the province of Ontario, water charges and sundry other revenues and \$44,467,234 to be met by levies against the member municipalities. Of the total gross expenditures the larger items were \$37,565,954 for education, \$9,162,230 for welfare and housing, \$3,665,000 for roads and \$6,468,746 for waterworks. City of Toronto estimates provided for a gross expenditure in 1956 of \$89,452,669, to be raised in part by a tax rate of 47.25 mills, 2.5 mills higher than in 1955. Total taxable assessment for 1956 was \$1,583,337,655.

(L. WN.)

ENCYCLOPEDIA BRITANNICA FILMS.—*Industrial Provinces of Canada* (1943).

Tourist Travel. In the United States, more than 80,000,000 vacationists, roughly half the population, took at least one trip during 1956; the volume of vacation travel had doubled since 1941 and had increased more than twenty-fold since the early 1920s. Leisure time in the form of annual paid vacations for approximately 42,000,000 persons, or

two-thirds of all wage and salary earners, contributed to this increase in travel.

The passenger car was the means of transportation in approximately 85% of all vacation trips; during 1956 approximately 24,000,000 automobiles, with an average of three passengers each, covered an average of 1,400 mi. in 12 days of travel. Each occupant spent an estimated average of \$165, bringing the total of automobile vacation expenditures to \$11,200,000,000.

The web of expressways and turnpikes spread out across the nation. With the opening of the Indiana turnpike, a route free of stop lights and intersections was completed from New York to Chicago, Ill. The Kentucky turnpike opened in late summer, and toll roads across Massachusetts and Kansas were scheduled for completion late in the year. Of major future significance to tourists was the enactment of federal highway legislation involving the spending of \$33,000,000,000, which would bring into being a 40,000-mi. national system of interstate highways.

The regions administered by the national park service were visited by 50,000,000 persons in 1955 and by an estimated 54,000,000 in 1956; more than 96% arrived by automobile. The most visited park in 1955 was Great Smoky mountain, Tenn.-N.C. (2,581,477), followed by Shenandoah, Va. (1,543,369), Rocky Mountain, Colo. (1,454,019), Yellowstone, Wyo.-Mont.-Ida. (1,368,515), Platt, Okla. (1,138,586) and Grand Teton, Wyo. (1,104,725).

Recreational use of the national forests in 1955 totalled 45,712,868 visits, a 13% increase over 1954, and 150% over 1946. Substantial increases were noted also in attendance at state parks, where total attendance throughout the U.S. was 183,000,000, 10% higher than in 1954 and 200% higher than 1946.

Construction of new motels, motor courts and motor hotels continued at a yearly pace of 1,500 to 2,000; along the roadsides of the U.S. approximately 53,000 motor courts offered lodging to the motorist in 1956; in 1940, by comparison, there were only 15,000 courts. On the other hand, hundreds of the nation's 19,000 hotels remodelled their lobbies, basements and adjacent property to provide convenient parking and entry. (See also HOTELS.)

Travel by means other than automobile received impetus from the installation of new equipment (streamlined rail coaches, dome cars, double-deck buses), excursion rates and the removal of the federal 10% transportation tax on trips to the Caribbean and Central America.

The trend in 1956 was toward low-cost travel. It was possible to fly from New York nonstop to Los Angeles, Calif., at reduced fares on a new air coach service, and rail coach transportation to Florida also was reduced in price. Airlines in trans-Atlantic service featured not only "fly now, pay later" plans but also offered multi-stopover and alternate route privileges at no extra cost.

Travel from the United States to other countries showed remarkable increases. An all-time high number of cars (2,524,993) visited Canada during 1955; this was 3% higher than in 1954 and 0.8% higher than the previous peak in 1953. Expenditures of visitors from all countries to Canada were estimated at \$329,000,000, an increase of 9% over 1954. Most of this, or \$304,000,000, was spent by visitors from the United States; their expenditures were 8% above 1954.

Canadians spent an estimated \$441,000,000 in other countries, an increase of \$54,000,000, or 14% over 1954.

A total of 105,011 tourist cars carrying 300,000 passengers passed from the U.S. to Mexico through the principal gateways of Laredo, El Paso and Brownsville, Tex., and through Nogales, Ariz., in 1955. The newest route, the Pacific highway from Nogales to Mexico City, became the second leading gateway, surpassed only by the traditional approach route via Laredo.

The extent of the international travel market was measured by

the department of commerce, in the first comprehensive study on the subject made by the U.S. government since 1939. It was found that total travel expenditures by U.S. residents outside the United States were \$1,500,000,000 in 1955; in 1954 they were \$1,300,000,000; and in 1939, \$376,000,000. United States visitors spent \$520,000,000 in Europe. The study showed also that people from other countries spent nearly \$650,000,000 in the United States, plus an additional \$60,000,000 on fares on U.S. international carriers. More than half came from Canada.

Europe, however, was the principal recipient of U.S. travel dollars. It earned 38.5% of the total, topping even Canada, which earned 27.8%. Following them were Mexico (19%), Bermuda, the West Indies and Central America (10%), South America (1.8%) and all others (2%).

Motoring abroad by U.S. tourists continued to boom. The A.A.A. expected to issue 50,000 international driving permits in 1956, compared with 30,000 in 1955.

(See also AMERICAN CITIZENS ABROAD; NATIONAL PARKS AND MONUMENTS; ROADS AND HIGHWAYS.) (Ml. Fe.)

Town and Regional Planning. In 1956 the rapid increase in population of urban areas continued to dominate planning in Europe and America.

United States.—In Nov. 1955, the bureau of the census issued revised population figures for the United States between 1950 and 1955. Of the 11,800,000 increase in population over the five-year period, 11,500,000 occurred in metropolitan areas. It was stated that a 1,900,000 increase took place in the central cities; 4,526,000 in urban areas outside the central cities; and 5,094,000 in the territory within the metropolitan areas classified as rural in 1950. The predictions for the future indicated that by 1975 more than 221,000,000 persons would be living in the United States. The scale of population increases had brought acute problems to city planners. During 1956 the emphasis was on metropolitan problems of planning and administration.

The New York Regional Plan association inaugurated a three-year study of the future economy and population of the New York metropolitan area, financed jointly by the Rockefeller Brothers fund and the Ford foundation, with a staff organized by the Harvard University Graduate School of Public Administration.

The county had also been used as a unit for planning and administration. In California all counties are required by law to set up planning commissions. Where the metropolitan region covers approximately a single county (as in Pulaski county around Little Rock, Ark.) the solution is simple, but when metropolitan areas extend over several counties in two or more states, the problem becomes more complicated. Some regional planning commissions had been created and regional administrative authorities were being discussed. A 21-member Northeastern Illinois Metropolitan Area Local Services commission was created by the Illinois general assembly to serve the Chicago metropolitan area, containing about 6,000,000 persons.

With the rapid growth of decentralized shopping centres, the plight of the downtown districts had become aggravated. A planning proposal which attracted nation-wide attention during the year was the plan financed by the president of an electric company in Fort Worth, Tex., and prepared by Victor Gruen and Associates, designers of the Northland shopping centre financed by the J. L. Hudson Co., of Detroit, Mich. The Fort Worth downtown plan, thus prepared under private auspices, had captured the general approval of the public, and it seemed likely that it would be adopted officially and put into effect. The plan provides for a one-way, multilaned circle around the downtown district, with no vehicular streets inside. This downtown island

is penetrated with six long parking structures, equipped with escalators and moving sidewalks. A remarkable feature of the plan is that none of the existing buildings would be torn down, except the old court house, already slated for replacement. Deliveries and taxis to hotels and shoppers' parcels to garages would move by underground tunnels. The free circulation of pedestrians in the streets freed from traffic would promote a hitherto unknown amenity for shoppers. The six garages would hold 60,000 cars when built to their full four stories. Access would be by ramps from the belt roadway. The story of this plan was told, with illustrations, in the *Architectural Forum* (May 1956).

Many cities moved during the year to revise their out-of-date zoning laws. New York city announced a second study aimed at revamping the city zoning regulations, adopted in 1916. In 1951 a zoning plan was prepared for the Planning commission, but it was never put into effect. In Washington, D.C., where the first zoning regulations were adopted in 1920, Harold M. Lewis, planning consultant, prepared a report, *Proposed Zoning Regulations for the District of Columbia*, together with a supplementary technical bulletin on *Land Use in the District of Columbia*.

The Federal Aid Highway bill of 1956 authorized the completion of the 41,000-mi. national system of interstate and defense highways, to be built on new 200-300-ft. rights of way, with limited access. During the following 13 years, 90% of highway expenditures would come from the federal government and the remaining 10% would be furnished by the states. These highways would connect the major metropolitan areas of the nation, and it was evident that up-to-date comprehensive plans based on land-use surveys would be needed if the routes into and across metropolitan areas were to serve rather than hinder local traffic.

A law was scheduled to go into effect on Jan. 1, 1957, to create a planning department in the city of Chicago, to be under the supervision of a commissioner of city planning to be appointed by the mayor. The Planning commission, with its membership reduced from 34 to 15 (9 citizens to be appointed by the mayor and 6 *ex officio* officials) would act in an advisory capacity.

Urban renewal and metropolitan and community planning received federal aid from the Housing and Home Finance agency. Under the urban planning assistance authorized by the Housing act of 1954, a total of 194 communities under 25,000 in population on Oct. 1, 1956, were receiving planning aid through federal funds allocated to state planning agencies. In addition 16 separate areas were receiving similar assistance for metropolitan and regional planning. Under the 1949 and subsequent housing acts approximately 243 communities throughout the country had inaugurated urban renewal projects which were in various stages of accomplishment. Under a federal demonstration grant from the Urban Renewal administration, under the 1954 Housing act, Cleveland planned to set up a pilot neighbourhood centre aimed to achieve voluntary neighbourhood improvement, which would develop citizen participation and support voluntary rehabilitation and conservation programs, with the assistance of city planning commissions, neighbourhood councils and other citizen groups.

Other Countries.—Most European cities continued to make progress in rebuilding devastated areas. In England a progress report on the new towns was presented in 1956. In nine years of activity a substantial part of accommodations for 55,000 people had been established. In Crawley, in March 1956, the local government of the area was consolidated by the formation of an Urban District council to serve about 6,000 ac. Also in March, the city corporation of London received Sir William Holford's notable report on rebuilding the area near St. Paul's cathedral.

In Canada on Aug. 1, 1956, a statement was made to the Cana-

dian Federation of Mayors and Municipalities outlining programs for the redevelopment of Canadian cities. Also during the year there were substantial extensions of authority for the 24-member Council of Metropolitan Toronto, which serves the city of Toronto and 12 suburban municipalities. The council, in addition to exercising traffic, school and police functions, was starting to buy parks. Thorncliffe Park, \$100,000,000 city within a city, was to be built four miles from downtown Toronto.

In Wellington, N.Z., the construction of a \$2,000,000 elevated expressway on reclaimed land along the waterfront was authorized to relieve congested traffic.

In 1956 at the International Federation for Housing and Town Planning there was presented a proposal adopted in 1955 by a transport committee for the creation of a transport board for greater Copenhagen (Den.), with the aim of stimulating collaboration and co-operation for planning and administering the transport system.

Israel, with a 1956 population of 1,600,000 people (one third concentrated in Tel Aviv) had set up a National Auxiliary Planning council.

(See also ARCHITECTURE; BUILDING AND CONSTRUCTION INDUSTRY; HOUSING; MUNICIPAL GOVERNMENT; URBAN TRANSPORTATION, U.S.)

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ENCYCLOPEDIA BRITANNICA FILMS.—*The Baltimore Plan* (1953); *Building America's Houses* (1947); *Cities—How They Grow*, 2nd ed. (1953); *The Living City* (1953).

Track and Field Sports.

The world's army of athletes, preparing for the Olympic games in Australia, went all out in their assault on the records in 1956. (The Olympic games of 1956 are treated separately in the article OLYMPIC GAMES.) Veterans and newcomers alike accounted for meet, sectional, national and world marks faster than they could be written into the books. The United States produced the brightest star of the year in David Sime, a sophomore at Duke university, but the youthful athlete who was considered a sure double winner in the Olympics was forced to the side lines by injury long before the year closed.

Sime created a stir in the indoor campaign when he tied the world standard of 6.1 sec. for 60 yd. and ran the 100 yd. in 9.5 sec., but when the outdoor drive began he became a sensation overnight. He set world records of 20 sec. for 220 yd. and 200 m. and broke the 220-yd. hurdles standard with a 22.2-sec. winning effort. In addition, he tied the long-standing mark of 9.3 sec. for 100 yd., as did several other stars during the year. Sime set a Drake relays' standard of 9.4 sec. for the 100 yd. at Des Moines, Ia., April 28, breaking a 30-year-old meet time. He set his hurdles marks on May 5 in a dual meet at Durham, N.C., and on the same day captured the 100 yd. in 9.4 sec. and the

220 yd. in 20.3 sec. In helping Duke defeat the University of North Carolina, Sime also placed second in the broad jump and third in the discus throw.

Parry O'Brien of the United States air force set some mark almost every time he threw the shot, while Harold Connolly of the Boston Athletic association and Mikhail Krivonosov of the U.S.S.R., who held the listed record, were extending each other for the honour of setting a new standard in the hammer throw. A young collegian from Kansas, Bill Nieder, moved up in the ranks of the shot-putters and gained a place on the American Olympic team with a toss of 58 ft. 1½ in. Another American, Charles Dumas of Compton (Calif.) college, became the first athlete in history to clear seven feet in the high jump when he won in the Olympic trials at 7 ft. ½ in.

The final Olympic tryouts at Los Angeles, June 29–30, and the Amateur Athletic Union of the United States outdoor championships at Bakersfield, Calif., June 22–23, were features of the long competitive season in the United States. Three world records fell in the team trials. Dumas set his high-jump mark and three men improved or tied the world record for the 400-m. hurdles: Glenn Davis, Ohio State university, did it in 49.5 sec.; Eddie Southern, University of Texas, was clocked in 49.7 sec.; and Josh Culbreath of the U.S. marines did it in 50.4 sec. The listed mark of 50.4 sec. was held by Yuri Lituyev of the U.S.S.R. Lou Jones of the U.S. army raced 400 m. in 45.2 sec. Three other standards were tied: Bobby Morrow ran 200 m. around a turn in 20.6 sec.; Thane Baker, Morrow and Ira Murchison ran 100-m. heats in 10.2 sec.; and Parry O'Brien put the shot 60 ft. 10 in. to equal his own recognized record.

In the A.A.U. outdoor games, nine championship meet marks were improved, one world record fell and another was tied. Jack Davis won his heat of the 110-m. high hurdles in 13.4 sec., the listed universal record being 13.5 sec. However, Davis finished second to Lee Calhoun in a 13.6-sec. final. Bobby Morrow won the first heat of the 100-m. dash in 10.2 sec. to tie a standard and went on to win the final in 10.3 sec. Arnold Sowell twice broke the meet mark of 1 min. 50 sec. for 800 m. that had stood since 1937. Sowell was timed at 1 min. 49.8 sec. in the first heat and took the final in 1 min. 47.6 sec. Tom Courtney shattered an A.A.U. mark with a 45.8-sec. performance in the 400-m. run. Horace Ashenfelter ran the 3,000-m. steeplechase in 9 min. 4.1 sec., which broke the former meet mark of 9 min. 13.1 sec. set in 1934. Ken Bantum of the New York Pioneer club, who moved into the front ranks of the world's shot-putters in 1956, broke O'Brien's A.A.U. standard when he won his specialty at 59 ft. 1½ in. Harold Connolly established another new standard for the meet when he captured the hammer throw at 205 ft. 10½ in.

One-Mile Run.—John Landy's world mark of 3 min. 58 sec., set on June 21, 1954, remained as the universal standard despite many brilliant efforts by the world's greatest distance men in 1956. Landy himself started the campaign off with a sparkling 3 min. 58.6 sec. mile at Melbourne on Jan. 28 for the second best time in history. It also was the first mile run under four minutes in Australia. Merv Lincoln, who placed second, was timed in 4 min. 0.6 sec. Landy visited the United States in May and twice ran the mile in less than four minutes. Jim Bailey, a comparatively unknown Australian runner attending the University of Oregon, scored the big upset of the 1956 season by defeating Landy on May 5 at Los Angeles. Running in an invitation special at the Southern California-U.C.L.A. meet, Bailey became the first to run a mile under four minutes on United States soil. The victor swept past Landy in the last 75 yd. to win by a yard in 3 min. 58.6 sec. Landy was clocked in 3 min. 58.7 sec. The former U.S. standard was 4 min. 0.5 sec. set by Wes Santee at Compton, Calif., in 1955. Completing the field were Ronald Delany of Ireland, a student at Villanova university; Bill Del-

Table I.—Major World Outdoor Records Improved, Oct. 1, 1955, to Oct. 1, 1956*

Event	Name and nationality	Place	Date	Performance	Approved record
100 m.	W. Williams, U.S.	Berlin, Ger.	Aug. 3	10.1 sec.	0:10.2
100 m.	I. Murchison, U.S.	Berlin	Aug. 4	10.1 sec.	0:10.2
100 m.	W. Williams, U.S.	Berlin	Aug. 5	10.1 sec.	0:10.2
200 m.	D. Sime, U.S.	Sanger, Calif.	June 9	20.0 sec.	0:20.2
220 yd.	M. Agostini, U.S.	Bakersfield, Calif.	March 17	20.1 sec.	0:20.2
220 yd.	D. Sime, U.S.	Durham, N.C.	May 11	20.1 sec.	0:20.2
220 yd.	D. Sime, U.S.	Sanger, Calif.	June 9	20.0 sec.	0:20.2
400 m.	L. Jones, U.S.	Los Angeles, Calif.	June 30	45.2 sec.	0:45.4
440 yd.	J. Lea, U.S.	Modesto, Calif.	May 26	45.8 sec.	0:46
110-m. hurdles	J. Davis, U.S.	Bakersfield, Calif.	June 22	13.4 sec.	0:13.5
200-m. hurdles	D. Sime, U.S.	Durham	May 5	22.2 sec.	0:22.3
220-yd. hurdles	D. Sime, U.S.	Durham	May 5	22.2 sec.	0:22.3
400-m. hurdles	G. Davis, U.S.	Los Angeles	June 29	49.5 sec.	0:50.4
400-m. hurdles	E. Southern, U.S.	Los Angeles	June 29	49.7 sec.	0:50.4
1,500 m.	I. Rozsavolgyi, Hungary	Budapest, Hung.	Aug. 3	3 min. 40.6 sec.	3:40.8
3,000 m.	G. Pirie, Great Britain	Malmo, Swed.	Sept. 4	7 min. 52.8 sec.	7:55.6
5,000 m.	G. Pirie, Great Britain	Bergen, Nor.	June 19	13 min. 36.8 sec.	13:40.6
10,000 m.	V. Kuts, U.S.S.R.	Moscow, U.S.S.R.	Sept. 11	28 min. 30.4 sec.	28:54.2
10,000 m.	S. Iharos, Hungary	Budapest	July 15	28 min. 42.8 sec.	28:54.2
3 mi.	S. Iharos, Hungary	Budapest	Oct. 23, 1955	13 min. 14.2 sec.	13:23.2
6 mi.	D. Stephens, Australia	Melbourne, Austr.	Jan. 25	27 min. 54 sec.	27:59.2
6 mi.	S. Iharos, Hungary	Budapest	July 15	27 min. 43.8 sec.	27:59.2
15 mi.	A. Viskari, Finland	Joensuu, Fin.	Sept. 9	1 hr. 15 min. 46.8 sec.	1:16:26.4
30 mi.	R. Pape, Great Britain	Hong Kong	Jan. 25	2 hr. 54 min. 4.5 sec.	2:57:04.8
25 km.	E. Oksanen, Finland	Anjala, Fin.	Sept. 9	1 hr. 16 min. 41 sec.	
25 km.	V. Karvonen, Finland	Anjala	Sept. 9	1 hr. 16 min. 51 sec.	
3,000-m. steeplechase	S. Rozsivaly, U.S.S.R.	Moscow	Aug. 14	8 min. 39.8 sec.	8:40.2
3,000-m. steeplechase	S. Rozsivaly, Hungary	Budapest	Sept. 16	8 min. 35.6 sec.	8:40.2
440-yd. relay	University of Texas, U.S.	Lawrence, Kan.	April 21	40.1 sec.	0:40.2
3,200-m. relay	Los Angeles A.C., U.S.	Modesto, Calif.	May 26	7 min. 25.2 sec.	7:28
3,200-m. relay	Belgian team	Brussels	Aug. 8	7 min. 15.8 sec.	7:25.2
2-mi. relay	Southern Pacific Assn., U.S.	Modesto	May 26	7 min. 25.2 sec.	7:27.3
5-mi. walk	J. Dolezal, Czechoslovakia	Manchester, Eng.	Oct. 15, 1955	34 min. 32.8 sec.	34:32.8
20 km. walk	V. Golubnichij, U.S.S.R.	Kiev, U.S.S.R.	Oct. 2, 1955	1 hr. 30 min. 2.8 sec.	1:30:02.8
30 km. walk	A. Vedjakov, U.S.S.R.	Moscow	Oct. 7, 1955	2 hr. 20 min. 40.2 sec.	2:20:40.2
30-mi. walk	A. Roka, Hungary	Budapest	Oct. 30, 1955	4 hr. 20 min. 10.6 sec.	4:20:10.6
Javelin throw	S. Nikkinen, Finland	Kuhmoinen, Fin.	June 24	274 ft. 9½ in.	268 ft. 2½ in.
Javelin throw	J. Sidlo, Poland	Milan, It.	June 30	274 ft. 5 in.	268 ft. 2½ in.
Javelin throw	B. Held, U.S.	Pasadena, Calif.	Sept. 22	270 ft.	268 ft. 2½ in.
High jump	C. Dumas, U.S.	Los Angeles	June 29	7 ft. ½ in.	6 ft. 11½ in.
56-lb. weight throw	R. Backus, U.S.	Baltimore, Md.	July 8	43 ft. 11 in.	43 ft. 5½ in.
Hammer throw	M. Krivonosov, U.S.S.R.	Nalchik, U.S.S.R.	April 25	216 ft. ½ in.	211 ft. ½ in.
Hammer throw	C. Blair, U.S.	Boston, Mass.	May 16	211 ft. 3 in.	211 ft. ½ in.
Hammer throw	C. Blair, U.S.	Needham, Mass.	July 4	216 ft. 4¾ in.	211 ft. ½ in.
Hammer throw	M. Krivonosov, U.S.S.R.	Moscow	July 8	217 ft. 9½ in.	211 ft. ½ in.
Shot-put	P. O'Brien, U.S.	Salt Lake City, Utah	May 5	61 ft. 1 in.	60 ft. 10 in.
Shot-put	P. O'Brien, U.S.	Los Angeles	June 15	61 ft. 4 in.	60 ft. 10 in.
Shot-put	P. O'Brien, U.S.	Pasadena	Aug. 18	61 ft. 4½ in.	60 ft. 10 in.
Shot-put	P. O'Brien, U.S.	Eugene, Ore.	Sept. 3	62 ft. 6¾ in.	60 ft. 10 in.
Shot-put	P. O'Brien, U.S.	Pasadena	Sept. 15	61 ft. 5¾ in.	60 ft. 10 in.
Women's 200 m.	B. Cuthbert, Australia	Sydney, Austr.	Sept. 16	23.2 sec.	0:23.4
Women's 880 yd.	N. Otalenko, U.S.S.R.	Moscow	June 10	2 min. 6.6 sec.	2:08.4
Women's 400-m. relay	U.S.S.R.	Kiev	July 27	45.2 sec.	0:45.6
Women's 400-m. relay	East Germany	Erfurt, Ger.	Aug. 12	45.2 sec.	0:45.6
Women's 400-m. relay	England	London, Eng.	Sept. 8	45.4 sec.	0:45.6
Women's 440-yd. relay	East Germany	Rostock, Ger.	July 29	45.8 sec.	0:46.3
Women's 880-yd. relay	East Germany	Rostock	July 29	1 min. 36.4 sec.	1:39.9
Women's high jump	T. Hopkins, Great Britain	Belfast, N. Ire.	May 5	5 ft. 8½ in.	5 ft. 8½ in.
Women's high jump	Y. Balas, Rumania	Bucharest, Rum.	July 14	5 ft. 8¾ in.	5 ft. 8½ in.
Women's broad jump	E. Dunska-Krzesinska, Poland	Budapest	Aug. 20	20 ft. 10 in.	20 ft. 7½ in.
Women's 80-m. hurdles	Z. Gastl, Austria	Cologne, Ger.	July 29	10.6 sec.	0:10.8
Women's 1,500 m.	P. Perkins, Great Britain	Hornchurch, Eng.	May 17	4 min. 35.4 sec.	4:37

*Date is 1956 unless otherwise indicated.

linger of Oregon; Jerome Walters of the Southern California Track and Field association; Danny Schweikart of the Los Angeles Athletic club; and Lon Spurrier of San Francisco. Competing in the west coast relays at Fresno, Calif., on May 12, Landy won a 3 min. 59.1 sec. mile, marking the sixth time he had cracked the "four-minute barrier." Landy triumphed by more than 75 yd., followed by Delany, Schweikart, Mike Stanley and Jim Terrill, the last two of the U.S. air force. A brilliant mile was recorded in the Compton meet on June 1 when Delany defeated Gunnar Nielsen of Denmark in 3 min. 59 sec. The Dane was clocked at 3 min. 59.1 sec.

Hungary's Istvan Rozsavolgyi became the tenth man to run the mile under four minutes when he scored at Budapest on Aug. 26 in 3 min. 59 sec. Rozsavolgyi had bettered the world standard for 1,500 m. three weeks before, when he was timed in 3 min. 40.6 sec. The then-recognized mark was Landy's 3 min. 40.8 sec. An unofficial list of world records improved from Oct. 1, 1955, to Oct. 1, 1956, appears in Table I.

Women's Track and Field.—Feminine athletes came in for a good share of honours in the Olympic year, accounting for a number of world marks. Featuring the U.S. season was the A.A.U. outdoor meet at Philadelphia, Pa., Aug. 17-18. National junior (14-17 years) competition was held on opening day, and six records fell. Pamela Kurrell, 17, of San Francisco was a triple victor, winning the baseball throw, javelin and discus. She set a U.S. standard of 140 ft. 11 in. in the discus. Other new women's records were as follows: shot-put, 37 ft. 10½ in., by Dixie Griffith, San Fernando, Calif.; 300-yd. relay, 32.4 sec., by Tennessee

State University club (Willie White, Darlene Scott, Martha Hudson, Willa Rudolph); broad jump, 18 ft. 56.6 in., by Willie White; high jump, 5 ft. 2 in., by Ann Marie Flynn of Brooklyn, N.Y.; 75-m. dash, 8.5 sec., by Martha Hudson, Tennessee State University club. Mae Faggs was a triple winner in the senior women's tests. Miss Faggs won the 100 m. in 11.7 sec. and the 200 m. in 24.6 sec. after tying the meet record of 24.2 sec. in a qualifying trial. She anchored the Tennessee club's 400-m. relay team that was clocked in 47.1 sec., beating a 23-year-old meet record by 0.8 sec. Earlene Brown of Compton set a U.S. standard of 45 ft. in winning the four-kilogram shot-put.

Indoor Season.—The national championships of the Amateur Athletic union, held in Madison Square Garden, New York city, on Feb. 18, 1956, featured the U.S. indoor campaign. Two world marks topped in the meet, Parry O'Brien putting the shot 61 ft. 5½ in. for the longest throw in history indoors or out, and Robert Backus of the New York Athletic club hurling the 35-lb. weight 63 ft. 10½ in. Lee Calhoun, of North Carolina college,

tied the meet record for the 60-yd. high hurdles by winning in 7.2 sec. Arnold Sowell of the University of Pittsburgh took the 1,000 yd. in 2 min. 8.4 sec. John Haines of the University of Pennsylvania gained his fourth straight victory in the 60-yd. dash, leading a star-studded field in 6.2 sec. Horace Ashenfelter, New York Athletic club, added to his long string of successes by winning the three-mile title for the fifth consecutive time. Henry Laskau of the 92nd Street Young Men's Hebrew association of New York city gained his ninth straight mile walking crown. O'Brien, one of the year's big standouts with his record-making shot-putting, broke his own mark with a toss of 59 ft. 9 in. in the New York Athletic club games of Feb. 11. Charles Jenkins set a universal standard of 56.4 sec. for the 500 yd. Bob Richards won the pole vault at 15 ft. 1 in., marking the 89th time he had cleared 15 ft. Sowell took the Halpin 880 yd. in 1 min. 51.8 sec.

Five meet marks were broken in the meet held by the Intercollegiate Association of Amateur Athletes of America at New York, Feb. 25, when the Manhattan college squad of New York city repeated as team champion. The new I.C.A.A. indoor standards set were as follows: 60 yd., 6.1 sec., by John Haines; pole vault, 15 ft. 2 in., by Donald Bragg of Villanova university; two mile, 9 min. 7 sec., by George King of New York university; 35-lb. weight throw, 62 ft. 8½ in., by Albert Hall of Cornell university; two-mile relay, 7 min. 40 sec., by the Pittsburgh team anchored by Sowell.

The indoor season was marred by the banning of Wes Santee, leading U.S. miler (4 min. 0.5 sec.), from amateur competition. The 23-year-old Kansan was declared ineligible for any further

Table II.—National A.A.U. Men's Championships

Event	Name and club	Performance
(Indoors, at New York City, Feb. 18, 1956)		
60-yd.	John Haines, University of Pennsylvania	6.2 sec.
60-yd. high hurdles	Lee Calhoun, North Carolina college	7.2 sec. (tied championship record)
600 yd.	Louis Jones, New York Pioneer club	1 min. 11 sec.
1,000 yd.	Arnold Sowell, University of Pittsburgh	2 min. 8.4 sec.
1 mi.	Ronald Delany, Villanova university	4 min. 14.5 sec.
3 mi.	Horace Ashenfelter, New York A.C.	14 min. 9.6 sec.
1-mi. walk	Henry Laskau, 92nd St. Y.M.H.A., New York	6 min. 44.5 sec.
1-mi. sprint medley relay	Villanova university (Charles Jenkins, Gene Maliff, George Sydnor, Al Peterson)	1 min. 52.9 sec.
1-mi. relay	New York Pioneer club (Joseph Gold, John Tucker, Richard Maiocco, Reginald Pearman)	3 min. 20.3 sec.
2-mi. relay	Syracuse university (Robert Milner, Art Ritchie, Bob Pugsley, Les Vielbig)	7 min. 37.9 sec.
Running high jump	Ernie Shelton, Los Angeles A.C.	6 ft. 9 in.
Running broad jump	Roy Range, unattached, Los Angeles	24 ft. 7 3/4 in.
16-lb. shot-put	Parry O'Brien, U.S. air force	61 ft. 5 1/4 in. (world and championship record)
35-lb. weight throw	Robert Backus, New York A.C.	63 ft. 10 1/2 in. (world and championship record)
Pole vault	Robert Richards (Los Angeles A.A.) and Don Bragg (Villanova university)	tied 15 ft. 1 in.
Team winner	New York Pioneer club	28 points
(Outdoors, at Bakersfield, Calif., June 22-23, 1956)		
100 m.	Bobby Morrow, Abilene Christian college	10.3 sec. (set meet record and tied world mark with 10.2 sec. in qualifying heat)
200 m.	Thone Baker, U.S. air force	20.6 sec. (tied U.S. record around one turn)
400 m.	Tom Courtney, New York A.C.	45.8 sec. (meet record)
800 m.	Arnold Sowell, University of Pittsburgh	1 min. 47.6 sec. (meet record)
1,500 m.	Jerome Walters, Los Angeles, Striders	3 min. 48.4 sec.
5,000 m.	Dick Hart, unattached, Philadelphia	14 min. 47.4 sec.
10,000 m.	Max Truex, Los Angeles, A.C.	30 min. 52 sec.
110-m. high hurdles	Lee Calhoun, North Carolina college	13.6 sec. (Jack Davis, Navy, second in final, set meet and world record of 13.4 sec. in qualifying heat)
200-m. low hurdles	Charles Pratt, New York Pioneer club	22.8 sec.
400-m. hurdles	Glenn Davis, Ohio State university	50.9 sec. (meet record)
3,000-m. steeplechase	Horace Ashenfelter, New York A.C.	9 min. 4.1 sec. (meet record)
3,000-m. walk	Henry Laskau, 92nd St. Y.M.H.A., New York	13 min. 39 sec.
Discus throw	Ron Drummond, Los Angeles A.C.	180 ft. 3 in.
56-lb. weight throw	Robert Backus, New York A.C.	43 ft.
Hop, step and jump	Willie Hollie, U.S. army	49 ft. 6 in.
Javelin throw	Cy Young, San Francisco Olympic club	247 ft. 11 1/2 in.
Hammer throw	Harold Connolly, Boston A.A.	205 ft. 10 1/2 in. (meet record)
Shot-put	Ken Bantum, New York Pioneer club	59 ft. 1 1/2 in. (meet record)
Broad jump	Ernie Shelby, Pierce Junior college, Calif.	26 ft. 1 1/4 in.
High jump	Charles Dumas, Compton college	6 ft. 10 in.
Pole vault	Bob Richards, Los Angeles A.C.	15 ft.
Team winner	New York A.C.	91 1/2 points

Table III.—National A.A.U. Women's Championships

Event	Name and club	Performance
(Indoors, at Washington, D.C., Jan. 21, 1956)		
50 yd.	Isabell Daniels, Tennessee A. and I. State university	6.2 sec. (broke meet and indoor world records with 5.8 sec. in qualifying heat)
100 yd.	Isabell Daniels	11.1 sec. (tied meet record)
220 yd.	Mae Faggs, Tennessee A. and I. State university	26.8 sec.
70-yd. hurdles	Constance Darnowski, German-American A.C., New York	9.7 sec.
440-yd. relay	Tennessee A. and I. State university (Ella Turner, Lucinda Williams, Isabell Daniels, Mae Faggs)	52.5 sec.
440-yd. medley relay	Tennessee A. and I. State university (Ella Turner, Margaret Matthews, Lucinda Williams, Charletta Reddick)	53 sec.
Standing broad jump	Nancy Phillips, German-American A.C., New York	8 ft. 2 1/4 in.
Running high jump	Mildred McDaniel, Tuskegee institute	5 ft. 4 in. (meet record)
4-kg. shot-put	Adele Tischer, Czechoslovakia	44 ft. 4 1/4 in. (world indoor and meet records)
Basketball throw	Catherine Walsh, Queens Mercurettes, New York	101 ft. 6 in.
Team winner	Tennessee A. and I. State university	34 points
(Outdoors, at Philadelphia, Pa., Aug. 17-18, 1956)		
50 m.	Isabell Daniels	6.4 sec.
100 m.	Mae Faggs	11.7 sec.
200 m.	Mae Faggs	24.6 sec.
80-m. hurdles	Bertha Diaz, Cuba	11.2 sec.
400-m. relay	Tennessee State University club A team (Martha Hudson, Willa Rudolph, Isabell Daniels, Mae Faggs)	47.1 sec. (meet record)
Running broad jump	Margaret Matthews, Tennessee State University club	19 ft. 4 in. (meet and U.S. citizens' records)
4-kg. shot-put	Earlene Brown, Compton, Calif.	45 ft. (U.S. record)
Discus throw	Pamela Kurrell, San Francisco	140 ft. 11 in. (U.S. record)
Running high jump	Mildred McDaniel, Tuskegee institute	5 ft. 4 in.
Javelin throw	Karen Anderson, Vesper Boat club, Philadelphia	159 ft. 1 in. (meet record)
Baseball throw	Pamela Kurrell, San Francisco	269 ft. 5 1/2 in.
Team winner	Tennessee State University club	95 points

Table IV.—National A.A.U. Outdoor Distance Events

Event	Name and club	Performance
15-km. run	Rudy Mendez, New York Pioneer club	52 min. 47 sec.
20-km. run	John J. Kelley, Boston A.A.	1 hr. 4 min. 21 sec.
25-km. run	John J. Kelley, Boston A.A.	1 hr. 21 min. 28 sec.
30-km. run	Ted Corbitt, New York Pioneer club	1 hr. 38 min. 47 sec.
Marathon	John J. Kelley, Boston A.A.	2 hr. 24 min. 52 sec.
10-km. walk	Henry H. Laskau, 92nd St. Y.M.H.A., New York	47 min. 58 sec.
15-km. walk	Henry Laskau, 92nd St. Y.M.H.A., New York	1 hr. 12 min. 40 sec.
20-km. walk	Alex Oakley, Gladstone A.C., Toronto	1 hr. 39 min. 6 sec.
25-km. walk	Henry Laskau, 92nd St. Y.M.H.A., New York	2 hr. 4 min. 35 sec.
30-km. walk	Capt. A. Weinacker, U.S. air force	2 hr. 39 min. 12 sec.
35-km. walk	Capt. A. Weinacker, U.S. air force	3 hr. 35 min. 3 sec.
40-km. walk	Capt. A. Weinacker, U.S. air force	3 hr. 38 min. 56 sec.
50-km. walk	Capt. A. Weinacker, U.S. air force	4 hr. 38 min. 57.5 sec.

Other Major A.A.U. Outdoor Champions

Decathlon	Rafer Johnson, University of California at Los Angeles	7,755 points
Pentathlon	Howard Smith, Los Angeles Striders	3,034 points
All-around	Charles Stevenson, New York A.C.	7,612 points

Table V.—I.C. 4-A. Championships

Event	Name and club	Performance
(Indoors, at New York City, Feb. 25, 1956)		
60 yd.	John Haines, University of Pennsylvania	6.1 sec. (set meet record and tied world indoor record)
60-yd. high hurdles	Rod Perry, Pennsylvania State university	7.3 sec.
600 yd.	Charles Jenkins, Villanova university	1 min. 11.9 sec.
1,000 yd.	Arnold Sowell, University of Pittsburgh	2 min. 13.5 sec.
1 mi.	Ronald Delany, Villanova university	4 min. 11.4 sec.
2 mi.	George King, New York university	9 min. 7 sec. (meet record)
1-mi. relay	Villanova university (Gene Maliff, R. Simpson, Warner Heitmaun, Charles Jenkins)	3 min. 19.6 sec.
2-mi. relay	University of Pittsburgh (James Moore, Wendell Harford, Perry Jones, Arnold Sowell)	7 min. 40 sec. (meet record)
High jump	Phil Reavis, Villanova university	6 ft. 5 in.
Broad jump	Leonard Moore, Manhattan college	23 ft. 5 1/2 in.
16-lb. shot-put	Ken Bantum, Manhattan college	55 ft. 6 3/4 in.
Pole vault	Donald Bragg, Villanova university	15 ft. 2 in. (meet record)
35-lb. weight throw	Albert Hall, Cornell university	62 ft. 8 1/2 in. (meet record)
Team winner	Manhattan college	36 points
(Outdoors, at New York City, May 25-26, 1956)		
100 yd.	Herb Carper, University of Pittsburgh	9.4 sec.
220 yd.	John Haines, University of Pennsylvania	20.5 sec.
440 yd.	John Haines, University of Pennsylvania	47.3 sec.
880 yd.	Arnold Sowell, University of Pittsburgh	1 min. 51.1 sec.
1 mi.	Ronald Delany, Villanova university	4 min. 14.4 sec.
2 mi.	Alex Breckenridge, Villanova university	9 min. 20.1 sec.
1-mi. relay	Villanova university (Gene Maliff, Al Peterson, R. Simpson, Charles Jenkins)	3 min. 14.9 sec.
120-yd. high hurdles	Rod Perry, Pennsylvania State university	14.3 sec.
220-yd. low hurdles	Vic Gavin, La Salle college	23.1 sec.
Pole vault	Donald Bragg, Villanova university	15 ft. (meet record)
High jump	Phil Reavis, Villanova university	6 ft. 6 1/2 in.
Broad jump	Len Moore, Manhattan college	23 ft. 8 1/4 in.
Shot-put	Ken Bantum, Manhattan college	56 ft. 8 in.
Hammer throw	William McWilliams (Bowdoin college) and Al Hall (Cornell university)	tied 196 ft. 2 1/2 in.
Discus throw	Arthur Siler, Harvard university	160 ft. 5 1/2 in.
Javelin throw	William Alley, Syracuse university	206 ft. 11 in.
Team winner	Manhattan college	42 1/2 points

Table VI.—N.C.A.A. Championships

Event	Name and club	Performance
(Outdoors, at Berkeley, Calif., June 15-16, 1956)		
100 m.	Bobby Morrow, Abilene Christian college	10.4 sec.
200 m.	Bobby Morrow, Abilene Christian college	20.6 sec. (meet record around one turn)
400 m.	J. W. Mashburn, Oklahoma A. and M. college	46.4 sec.
800 m.	Arnold Sowell, University of Pittsburgh	1 min. 46.7 sec. (U.S. citizens' record)
1,500 m.	Ronald Delany, Villanova university	3 min. 47.3 sec. (meet record)
5,000 m.	Bill Dellinger, University of Oregon	14 min. 48.5 sec.
10,000 m.	Selwyn Jones, Michigan State university	31 min. 15.3 sec. (meet record)
3,000-m. steeplechase	Henry Kennedy, Michigan State university	9 min. 16.5 sec. (meet record)
110-m. high hurdles	Lee Calhoun, North Carolina college	13.7 sec. (meet record)
400-m. hurdles	Aubrey Lewis, University of Notre Dame	51 sec. (meet record)
Hammer throw	William McWilliams, Bowdoin college	195 ft. 3 in. (meet record)
Shot-put	Ken Bantum, Manhattan college	60 ft. 1/2 in. (meet record)
Javelin throw	Phil Conley, California Institute of Technology	238 ft. 11 in.
Discus throw	Ron Drummond, University of California at Los Angeles	173 ft. 1/2 in.
Pole vault	Bob Gutowski (Occidental college) and Jim Graham (Oklahoma A. and M. college)	tied 14 ft. 8 in.
Hop, step and jump	Bill Sharpe, West Chester (Pa.) State Teachers college	50 ft. 4 3/4 in. (meet record)
High jump	Phil Reavis (Villanova university), Bob Lang (University of Missouri) and Nick Dyer (University of California at Los Angeles)	tied 6 ft. 6 1/4 in.
Broad jump	Greg Bell, Indiana university	25 ft. 9 1/4 in.
Team winner	University of California at Los Angeles	55.7 points

A.A.U. membership for an infraction of the rules regarding travelling expenses. The lifetime suspension was upheld in the New York supreme court, Justice Walter A. Lynch sitting, on May 15.

(T. V. H.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Dashes, Hurdles, and Relays* (1938); *Distance Races* (1938); *Fundamentals of Track and Field* (1954); *Headsprings in the Gym* (1950); *Jumps and Pole Vault* (1938); *Weight Events* (1938).

Trade Agreements: see INTERNATIONAL TRADE; TARIFFS.

Trade Commission, Federal: see FEDERAL TRADE COMMISSION.

Trade-Marks: see PATENTS AND TRADE-MARKS.

Trade Unions: see LABOUR UNIONS.

Traffic Accidents: see ACCIDENTS; DISASTERS.

Traffic and Parking: see MUNICIPAL GOVERNMENT.

Tranquillizing Drugs: see CHEMISTRY; MEDICINE; PHYSIOLOGY; PSYCHIATRY.

Transportation: see AVIATION, CIVIL; MOTOR TRANSPORTATION; RAILROADS; URBAN TRANSPORTATION, U.S.

Trap-shooting: see SHOOTING.

Travel: see TOURIST TRAVEL.

Treasury, U.S. Department of: see GOVERNMENT DEPARTMENTS AND BUREAUS, U.S.

Trinidad and Tobago. This British colony consists of two islands off the coast of Venezuela north of the Orinoco delta. Area: 1,080 sq.mi. (Tobago, 116 sq.mi.). Pop.: (1946 census) 557,970 (Tobago 27,208), including 261,485 Africans, 195,747 East Indians and 78,775 coloured (mixed); (1955 est.) 697,550 (about 5% in Tobago). Languages: English (*lingua franca*), Hindi, French, Spanish. Religion: Christian 70% (of which one-half Roman Catholic, one-third Anglican), Hindu 23%, Moslem 6%. Chief towns (pop., 1955): port of Spain (cap.) 114,150; San Fernando (port) 36,050; Scarborough (Tobago) 1,000. Governor in 1956, Sir Edward Beetham; chief minister, Eric Williams.

History.—A new constitution was announced on Feb. 13, 1956, providing for an increase in the number of ministries from five to eight including a chief minister and minister of finance; an executive council comprising the governor as president, the colonial secretary and the attorney general as ex-officio members, the chief minister and seven other elected ministers; and a legislature of two ex-officio members (colonial secretary and attorney general), 5 nominated members, 24 elected members and a speaker elected by the house from within or without. A committee was appointed on March 9 to consider redemarcation of electoral districts, and on March 23 the legislature authorized a loan of \$3,000,000 (British West Indian dollars) for operating a public housing loans scheme. Construction of an auxiliary highway east of Port of Spain was begun. In June official delegates attended discussions in London with the British government and the Texas Oil company of the United States and approved the sale of the Trinidad Oil company's interests in Trinidad to the Texas Oil company.

The Mudie commission arrived on July 9 to survey and select three alternative sites in the British West Indies for the federal capital.

At the general election on Sept. 24 the People's National Movement gained 13 seats and its leader, Eric Williams, accepted an invitation to form a government. The new legislature was inaugurated on Oct. 26.

(H. E. CN.)

Education.—Schools (1954): primary and intermediate 367, pupils 137,646; secondary 29, pupils 11,581. Teachers' training colleges 3, students 218. Vocational: East Caribbean Farm institute; San Fernando government technical college; Imperial College of Tropical Agriculture, students 84; extramural classes, in Trinidad, intermediate level, of the University College of the West Indies; board of industrial training.

Finance and Trade.—Monetary unit: British West Indian dollar, B.W.I.

\$1.7=U.S. \$1. Budget (1955): revenue £16,980,000; expenditure £17,958,000. Foreign trade (1955): imports B.W.I. \$294,023,000; exports B.W.I. \$285,939,000. Principal exports: sugar, crude oil, cocoa, asphalt, asphalt cement. Principal imports: machinery, tobacco, food, manufactured goods.

ENCYCLOPÆDIA BRITANNICA FILMS.—*Caribbean* (1955).

Tropical Diseases. With relatively few exceptions the diseases of warm climates are preventable. A majority of these are caused by microorganisms and animal parasites. In many instances the living agents of disease are transmitted to man by insects or other arthropods such as ticks and mites. Under such circumstances modern methods of control usually consist in the elimination of the arthropod transmitter (e.g., the vector) or at least its reduction to a level where it is unable to transmit the disease-producing agent. A complementary method of approach is the administration of drugs to active or carrier cases of the infection so that the number of infected individuals is too few to provide a reservoir of disease agents for transmission by the vector. These methods of prevention are particularly applicable when only man and domestic vectors are involved. However, for several diseases prevalent in both warm and cold climates there are wild reservoir hosts which ordinarily replace man in the life cycle of the parasite, and in some instances nondomestic arthropod vectors are the usual transmitters. During 1956 special attention of epidemiologists and public health officers engaged in the prevention of diseases in the tropics was being focused on the control of arthropod vectors.

Malaria.—P. F. Russell, in his recent study *Man's Mastery of Malaria*, interprets mastery as not necessarily eradication of this disease but the knowledge and ability to control it in extensive areas of the world where more than 1,000,000,000 human beings "live in potentially or actually malarious communities," 250,000,000 still suffer attacks of malaria each year and 2,500,000 die annually from its effects. In contrast, 160,000,000 persons live in areas presently protected from malaria. As of 1956 the Pan American Sanitary bureau had just embarked on a program of malaria eradication in the western hemisphere, the Balkan countries had jointly begun a similar project, and India was conducting the most extensive antimalarial campaign in world history. All these countries were attacking the *Anopheles* mosquito by DDT residual spraying. The World Health organization (1956) urged intensive eradication efforts to avoid the possible danger that the mosquito vectors might develop resistance to this insecticide.

Yellow Fever.—Although urban yellow fever, transmitted by the domestic mosquito *Aedes aegypti*, was not reported during 1956, sylvatic foci in the tropical zones of Africa and the Americas remained unconquered and were kept under close surveillance. Of particular interest was the northward extension of sylvatic yellow fever into Central America, first recognized in eastern Panamá in 1948, then in Costa Rica (1951-52), Nicaragua (1952-53) and Honduras (1953-54). Here the disease was believed to have reached a barrier of cleared land, so that its extension into Guatemala was not generally expected. However, in Dec. 1955 and Jan. 1956 there was confirmed evidence that the disease had jumped the barrier, survived a dry season and was responsible for death of monkeys in the jungle along the Atlantic coast of Guatemala. Yellow fever vaccine prepared in the Carlos Finlay institute (Bogotá, Colom.) was being employed extensively to protect human populations living in the areas of potential exposure adjacent to the jungle type of the disease.

Typhus Fever.—This disease is produced by two closely related species of microorganisms referred to as rickettsias: one, *Rickettsia mooseri*, prevalent (enzootic) in rats and transmitted more or less sporadically to man by infected rat fleas; the other, *Rickettsia prowazeki*, causing epidemic human disease and trans-

mitted from man to man by human body lice. Characteristically epidemic typhus, which is severer and more often fatal than the murine type, occurs most frequently in louse-infested populations, among persons who wear heavy clothing and seldom bathe.

Since the discovery of the causative agent of epidemic typhus in 1916 many attempts had been made to provide a vaccine for immunization of persons exposed to the epidemic form of the disease. Two types of vaccine were developed; viz., (1) living rickettsias obtained from infected lice or experimentally infected laboratory animals and (2) killed rickettsias. The former usually provides solid immunity but at times causes disease as serious as the natural infection. Hence the killed organisms from highly virulent strains grown on chick embryos had been employed in recent years in most immunization programs. In 1943 a strain of *Rickettsia prowazeki* (strain E), grown in chick embryo yolk sac, was found to have acquired such low pathogenicity that it failed to infect guinea pigs. A large number of uncontrolled human immunizations were soon carried out in Spain. Then between 1951 and 1954 carefully controlled tests with human volunteers were conducted in the United States; these demonstrated both the usefulness and safety of employing this attenuated living rickettsia. Meanwhile field studies were undertaken among a highly exposed population in Peru, involving nearly 17,000 persons. Although these large-scale immunization tests had not been completely evaluated, no truly serious illness had resulted from administration of strain E, and a single inoculation of a quantitated number of the organisms might be expected to provide solid and lasting immunity, thus obviating the necessity of giving booster inoculations every two years.

Amoebiasis.—Human infection with the disease-producing amoeba *Entamoeba histolytica* is world-wide in its distribution. While a majority of infected persons are not seriously inconvenienced, some persons develop severe colitis, at times liver abscess and involvement of other extraintestinal organs. In 1920 only two standard antiamoebic drugs, ipecac and emetine, were available. By 1956 there were several chemically different groups of more effective, better tolerated chemotherapeutics, including compounds of iodine and arsenic, chloroquine for amoebic involvement of the liver, and several antibiotics. New preparations were being tested each year, first in experimental animals, then clinically. Some of these had relatively high antiamoebic properties, yet none of the newer drugs was superior to those which had withstood the test of many thousands of clinical trials.

Deficiency Diseases in Childhood.—In tropical countries the commonest disease of childhood after the first year of life is probably malnutrition. After the child is weaned there may be an adequate number of calories in the diet, but this is usually almost exclusively from carbohydrates, with a deficit in animal proteins, vitamins, minerals and frequently fats. Failure to provide a substitute for mother's milk results in the syndrome "kwashiorkor," which can usually be observed in any clinic for underprivileged children in warm climates. However, kwashiorkor is generally much less common than the general picture of malnutrition, with demonstration of a significant decrease in blood proteins. Almost invariably superimposed on this deficiency is hookworm disease or other intestinal helminthic infections, which further reduce the nutritional balance and produce severe anaemia or an allergic state.

(See also EPIDEMIOLOGY; WORLD HEALTH ORGANIZATION.)

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(E. C. F.)

Trucial Sheikhdoms: see PERSIAN GULF STATES.

Truck Crops: see VEGETABLES.

Trucks: see AUTOMOBILE INDUSTRY; MOTOR TRANSPORTATION.

Trust Territories. These include former German colonies and islands which became mandates after World War I and trust territories after World War II; South-West Africa, which remained mandated; and the former Italian Somaliland (now Somalia) which became a trust territory under Italian administration on April 1, 1950. Total area: 1,229,455 sq.mi.; total population, about 21,722,990. Certain essential information is given in the table.

Trust and Mandated Territories

Territory	Area (in sq.mi.)	Population	Administering Authority
South-West Africa*	317,725	414,601 (1951 census)	South Africa
Togoland (Br.)	13,041	429,000 (1955 est.)	United Kingdom
Togo (Fr.)	21,235	1,070,000 (1955 est.)	France
Cameroons (Br.)	34,081	1,460,000 (1954 est.)	United Kingdom
Cameroon (Fr.)	166,793	3,116,000 (1955 est.)	France
Tanganyika	362,688	8,324,000 (1955 est.)	United Kingdom
Ruanda-Urundi	20,742	4,271,000 (1954 est.)	Belgium
New Guinea†	93,050	1,206,749 (1954 est.)	Australia
Western Samoa	1,131	94,128 (1954 est.)	New Zealand
Nauru	8	3,473 (1954 census)	Australia
Pacific Islands‡	687	65,039 (1956 est.)	United States
Somalia	198,275	1,269,000 (1954 est.)	Italy

*Mandate. †Northeast New Guinea, Bismarck archipelago, certain of the Solomon Islands. ‡Marshall, Caroline and Mariana Islands, former Japanese mandates.

History.—The year 1956 marked the 10th anniversary of the establishment of the trusteeship system of the United Nations. At the opening of the 18th session of the trusteeship council the new president, Rakif Asha of Syria, stressed the "notable progress" made during the first ten years. The outstanding event of the year was the first plebiscite ever to be held in a United Nations trust territory; this was completed during May in British-administered Togoland. All the preparations were carried out under the supervision of a specially appointed UN commissioner, Eduardo Espinosa Prieto of Mexico. He was assisted by a company of UN observers who worked from 13 stations throughout Togoland. On May 9, after an intensive educational campaign to explain the object of the plebiscite, the Togolandese were asked to state whether they desired the union of their country with the neighbouring Gold Coast or continuance under a trusteeship regime pending the ultimate determination of the territory's political future. At its summer session, the trusteeship council received a full report on the plebiscite. Of the 194,230 eligible voters on the register, 160,587 had recorded valid votes. A total of 93,095 (58%) were in favour of union with the Gold Coast, and 67,492 (42%) supported separation. Without dissent, the council adopted a resolution paving the way for the United Kingdom to end its trusteeship over the territory at the same time as the Gold Coast attained its independence. Termination of the trusteeship agreement, however, would require the approval of the UN general assembly.

In accordance with established practice, the trusteeship council held two regular sessions during 1956. At the 17th session (Feb. 7 to April 6), Italy took its seat as a full member following its recent admission to the United Nations. The enlarged council consisted of Australia, Belgium, France, Italy, New Zealand, United Kingdom and United States (administering members); and Burma, China, Guatemala, Haiti, India, Syria and U.S.S.R. (nonadministering members). This "African session" examined annual reports on British-administered Tanganyika and Cameroons, Ruanda-Urundi under Belgian administration, and French Cameroun and Togoland, in conjunction with the reports of recent visiting missions. A record number of 731 petitions was examined by the council. In addition to these, the receipt of about 35,000 communications from French Cameroun created a serious problem. Most, according to the French representative, were concerned with minor personal

grievances. It was decided to establish a special committee of two (Australia and India) to study this mass of material with the aid of the UN secretariat.

The 18th session (June 7 to August 14) proved to be the longest continuous session in the history of the council. Elected members of the first Somali legislature, including the prime minister, travelled to New York for the first item on the agenda. The council commended the Italian administration for taking important steps toward self-government in Somalia nearly four years before the due date.

The visiting mission under the chairmanship of Sir John Macpherson (U.K.), which had studied conditions in trusteeship areas in the Pacific, reported that laudable political advances had taken place. Nevertheless, a number of major problems remained to be solved. One such problem in the Marshall islands concerned the displacement of islanders as a result of atomic and thermonuclear tests.

In an advisory opinion issued on June 1, the International Court of Justice at The Hague found it admissible for the UN committee on South-West Africa to receive oral petitions on matters relating to the territory. The committee itself unanimously expressed its opinion to the general assembly that the situation in South-West Africa required "close re-examination," in view of the continued failure of South Africa to co-operate in carrying out the previous advisory opinion relating to South-West Africa given by the court in 1950. (See also UNITED NATIONS.) (L. R. A.)

See *Report of the United Nations Plebiscite Commissioner for Togoland*; UN Visiting Mission to West Africa, *Reports on Cameroons Under British and French Administration*; UN Visiting Mission to the Pacific, *Reports on Western Samoa, Nauru, New Guinea and Pacific Islands*. (All New York, 1956.)

Trust Territory of the Pacific Islands: see MARSHALL, CAROLINE AND MARIANA ISLANDS.

Tuberculosis. Despite progress, tuberculosis remained during 1956 the most destructive infectious disease. G. J. Drolet and A. M. Lowell (New York) said that the ultimate measure of progress should be the absence of infection. Tuberculin testing in several parts of the world showed that at age 15 incidence of reactors ranged from 12% in Lebanon to 85% in Polish cities.

In 1936-37 and in 1940-41 J. D. Aronson (Philadelphia) found that 52.8% of American Indian children 5 to 19 years of age in a certain area reacted to tuberculin, but in 1954 only 23.7% reacted. Similar reductions were reported among American Indian children in other areas. In Los Angeles, Calif., in six senior and ten junior high schools 24.5% of students reacted to tuberculin in 1940-41, but only 12% in 1954-55. D. F. Loewen said that in 1935, 31% of city and 25% of rural high school students reacted to tuberculin in Macon county, Ill., but in 1955 only 4% reacted. C. E. Palmer *et al.* (Washington, D.C.) reported on tuberculin testing of 120,000 white men and women from 17 to 21 years of age. They comprised navy recruits from all parts of the United States and students entering colleges and universities in 17 states. The average incidence of reactors was 8.8%.

The number of cases of clinical tuberculosis paralleled the number of tuberculin reactors, but at a lower level. Drolet and Lowell said that 340,416 new cases were reported in 1953 in the United States, the United Kingdom, France and Germany. If previously known cases were added, the total was more than 1,000,000. In Peru 180,000 persons had clinical tuberculosis, of whom 30,000 were in the city of Lima. An estimated 50,000,000 persons were ill from tuberculosis in the world.

Diagnosis.—The tuberculin test remained the only procedure for diagnosing tuberculosis within a few weeks after the germs invade the body. This, followed by X-ray film inspection of the

chest of reactors, constituted the two best screens in selection of persons to be completely examined.

C. T. Dotter said the mass chest X-ray survey was a poor approach to tuberculosis control, inasmuch as positive radiographic findings usually lag well behind the onset of clinical disease. By means of the tuberculin test persons harbouring tubercle bacilli can be discovered. Routine chest roentgenography is indispensable in diagnostic follow-up.

L. V. Schneider, director of the United States Veterans administration tuberculosis case finding survey, stated that from 1950 through 1955, 4,035,932 chest examinations were made and 15,479 persons were found to have active tuberculosis. As of 1956 this survey program was averaging about 1,000,000 routine chest X-ray film inspections annually, and approximately 2,000 active cases were being found each year.

Importance of accuracy in diagnosis was re-emphasized, since the tuberculin test and X-ray shadows are only screens. Complete examinations were necessary to determine cause of demonstrable areas of disease.

Treatment.—Nothing was found superior to the standard methods, consisting of rest and hospitalization. Antituberculosis drugs and resectional surgery were regarded only as adjuncts. In many parts of the world there remained a serious shortage of sanatorium beds. In Peru 3,000 beds were available but 40,000 were needed. H. A. Rusk (New York) stated that for the 500,000 cases in Korea there were only 3,000 beds in 1954, with a goal of 8,000 by 1958. It was hoped that 250 tuberculosis ambulatory treatment centres might become available within five years.

Because of the decrease in the number of new cases of tuberculosis in a few parts of the world, and because antituberculosis drugs and resectional surgery were being employed and many persons were being treated at home, the demand for sanatorium beds had decreased. Three public and two private tuberculosis hospitals were closed in upstate New York. Sanatoria were also closed in other states, although many physicians regarded their closing as premature.

The Veterans administration, the army and the navy continued to issue quarterly progress reports on chemotherapy of tuberculosis. This included studies on various combinations and dosages of well-known drugs and testing of new ones. W. B. Tucker (Washington, D.C.) analyzed results of these studies and reported that isoniazid and para-aminosalicylic acid administered daily gave the best results, but isoniazid daily and streptomycin twice weekly were only slightly less effective. Other drugs, including cycloserine, were investigated.

The committee on therapy of the American Trudeau society stressed the importance of routine tuberculin testing of infants before one year of age and repeated annual testing thereafter when negative. The committee also emphasized that it would be several years before it could be determined from the carefully controlled studies which were under way whether administration of antituberculosis drugs to recent tuberculin converters was effective. However, it was suggested that infants who had recently become reactors might be treated with isoniazid to prevent the possibility of development of meningitis.

Resection of diseased areas of the lung continued to be extensively employed. J. J. Hirdes and C. I. Stegerhoek (Netherlands) reported 700 cases of lung resections performed between 1949 and 1954. Their follow-up was completed Feb. 1, 1955, by which time 3.3% of the patients had died. The total number of relapses was 7%. Ninety-two per cent of the patients were in good condition.

L. B. Brown *et al.* (Virginia) described 226 pulmonary resections ranging from pneumonectomy to wedge resections. One group consisted of 106 persons who were discharged from the sanatorium between 1949 and 1952. The other group consisted of

120 who were discharged from the sanatorium between July 1952 and June 1953. In Dec. 1953, 80.5% of all these patients had arrested disease, 6.6% were active and 3.1% were dead. The status of 9.7% was unknown. It was recommended that drug treatment be administered for 4 months before surgery and for at least 6 to 12 months after.

J. L. Robinson *et al.* (Los Angeles) did follow-up studies on 164 patients who had lung resections between 1944 and 1953. Of 150 followed by yearly examinations, 94% had been rendered noncontagious; of 161 who were followed for at least a year, 92.5% were living and well. Similar studies of 120 patients who had thoracoplasty during the same period showed 82% with reversal of contagion and 86.4% living and well. From the standpoint of survival, 96.2% of those with resection and 95.4% of those with thoracoplasty were living.

A. Falk and N. K. Jensen (Minnesota) did bilateral pulmonary resections in 60 patients between 1951 and July 1955. The initial bacteriologic conversion rate was 95%, and this was maintained.

I. Kalkvist (Sweden) performed excisional surgery between Nov. 1949 and Dec. 1954 on 36 persons more than 50 years old. The surgery was well tolerated. He concluded that age as such should not be accepted as a contraindication to pulmonary resection.

As the number of persons with contagious tuberculosis decreased, certain groups, such as recalcitrants and alcoholics became more conspicuous.

Dan Morse stated that at the Peoria municipal sanatorium from 1951 to 1955, 75 of 524 admissions were alcoholics. Of patients who left the sanatorium against medical advice, 52% were alcoholics. D. D. Deakins *et al.* examined 3,156 San Joaquin County honour farm prisoners from July 1953 to Dec. 1954 and found 17.7 cases of active tuberculosis per 1,000 persons. H. I. Meyers *et al.* reported on the first year of operation of the Los Angeles County jail chest screening program, when 6.3 per 1,000 were found to have active tuberculosis.

Prevention.—The only generally accepted method of preventing tuberculosis consisted of protecting against tubercle bacilli so as to avoid their initial invasion. This included contagious disease technique, and careful observation of tuberculin reactors and all persons with "arrested" disease to keep their tubercle bacilli controlled.

Tuberculosis is notoriously a relapsing disease. A. S. Dooneief *et al.* (New York) pointed out that treated pulmonary tuberculosis carries a high risk of relapse after apparent control. The incidence of reactivation or relapse prior to chemotherapy ranged from 24% to more than 50% in patients followed 20 years after arrest. They reported a series of 172 persons who were discharged from the hospital but continued indefinitely on drugs, with no relapse in 98.3% after 12 to 45 months.

Observations showed that tuberculosis among domestic animals and pets may be a serious threat to persons who are not protected from them. In Germany 30% to 50% of cattle and 60% to 70% of older cows were said to be infected, and one human case of tuberculosis in ten was caused by the bovine type of tubercle bacillus. The bovine type of tuberculosis was found in 80 cats (6.3%) necropsied in Zürich, Switz., after 1949.

A. Paley *et al.* pointed out that newer medical and surgical measures were changing the psychological problems of treatment and rehabilitation in tuberculosis. In their work at the National Jewish hospital in Denver, Colo., they placed patients on increasing ambulatory activity, regardless of the extent of the illness, within three to eight weeks after admission. They said, "A rehabilitation team, including psychiatrists and social workers, helps not only patients but personnel to overcome the psychological barriers to rehabilitation."

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Tungsten: see MINERAL AND METAL PRODUCTION AND PRICES.

Tunisia. Tunisia is an independent *beylicat* (kingdom) in North Africa, lying between Algeria (west) and Libya (east). Area: 48,332 sq.mi. Pop.: (1946 census) 3,230,952; (1956 census) 3,782,480, 91% Moslem and Arabic-speaking (Arabs and Berbers), but including 255,332 Europeans (180,450 French citizens and 69,909 Italians) and 57,786 Jews. Chief towns (pop., 1956 census): Tunis (cap.) 410,000; Sfax 65,635; Sousse 48,172; Bizerta 44,681. Ruler, Bey Mohammed el-Amin. Prime ministers in 1956: Tahar ben Ammar and (from April) Habib Bourguiba.

History.—In Jan. 1956, Tahar ben Ammar's government which had the support of the Neo-Destour, decided to hold elections on a basis of direct universal suffrage with a view to forming a constituent assembly. Salah ben Youssef, back from Cairo, organized an agitation against Habib Bourguiba and seemed to be carrying his claims to dangerous lengths; then the party emerging in support of him was shattered by police investigations and arrests, and in Jan. 1956 Salah fled to Libya. The Old Destour party abstained from the polls, so that the only candidates were those of the Neo-Destour's National front and the Communists.

In Paris, on March 20 the Franco-Tunisian protocol was signed. France recognized the independence of Tunisia; the Bardo treaty (May 12, 1881) was annulled. The two countries went on to define their "freely effected interdependence" and to promise co-operation in defense and in foreign relations. Christian Pineau signed for France, Tahar ben Ammar for Tunisia. Pineau declared: "The agreement shows the French government's confidence in Tunisia. France's mission has now been discharged."

Six days later, the National front won all 98 seats at the elections, getting 597,000 votes against the Communist's 7,000. Of the total electorate, about 83% voted.

On April 10 the bey appointed Bourguiba prime minister. Bourguiba then formed a Neo-Destour cabinet, with two members representing the trade unions and two independents. He himself took the portfolios of foreign affairs and of defense.

Despite his declaring that Tunisia's solidarity with the Algerian people was "complete and unreserved," France negotiated further agreements with Bourguiba. By that of June 15 it was decided that France and Tunisia should exchange ambassadors and that France, on Tunisia's request, might represent Tunisia in certain countries. Roger Seydoux, the last resident general (appointed in Sept. 1955), was accredited as French ambassador in Tunisia.

Legislation passed in August was such as to revolutionize Tunisian life: polygamy was abolished; marriage was forbidden to persons under 15 years of age; women over 20 years of age were to be free to marry without the consent of third parties; and divorce by repudiation was replaced by judicial divorce.

In October relations between France and Tunisia underwent a crisis because of the arrest of the five Algerian nationalist leaders who were flying from Morocco to Tunis. (See also FRANCE.) Relations were broken off and Tunisia decided to assume control of its frontiers. Relations were resumed in December. Bourguiba congratulated himself on achieving French understanding at the United Nations, to which Tunis was admitted on Nov. 12. A new French ambassador was appointed. Two Tunisian consulates-general were created in France, in Paris and Marseilles. Four French consulates-general were set up in Tunisia,

at Tunis, Bizerta, Sfax and Susa.

The Tunisian government officially denied rumours of its adherence to the Arab league.

(See also FRENCH UNION.)

(HU. DE.)

Foreign Trade.—(1955) Monetary unit: Tunisian franc=metropolitan franc. Note circulation 28,000,000,000 fr. Imports 63,000,000,000 fr., including 47,000,000,000 fr. from France. Exports 37,000,000,000 fr., including 20,000,000,000 to France. Principal exports: phosphates 6,000,000,000 fr., wheat 5,000,000,000 fr., iron ore 4,000,000,000 fr.

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Tunnels. In 1956, hard-rock tunnellers continued to break progress records, many of which were set in 1955. Tunnelling in earth and soft rock reached new highs in technical proficiency, involving a huge boring machine; a unique method of lining; and outstanding progress on three vehicular underwater tunnels being constructed by dredging a trench and setting prefabricated sections in place, rather than by tunnelling underneath the rivers. In 1956, tunnels in connection with hydroelectric projects shared the spotlight with those in connection with water-supply and sewerage projects, reflecting emphasis by cities in going longer and longer distances for good water and in conducting area-wide sewage cleanup programs.

Asia.—The Kammon tunnel, a 2.2-mi. bore linking the Japanese islands of Honshu and Kyushu, was advanced to more than 70% of completion. It was claimed to be the first underwater two-story tube, having a 25 by 15-ft. upper level for vehicles and a 12 by 8-ft. lower level for pedestrians. Japan also completed the Sakuma hydroelectric power project near Tokyo which featured two hard-rock diversion tunnels, each 37 ft. in diameter and 2,200 ft. long.

The 8,200-ft. Bahihal tunnel between India and the Kashmir valley, comprising twin tubes of 18-ft. diameter, was completed.

Oceania.—Drillers of the 24-ft. diameter Eucumbene tunnel in Australia, key structure of the Snowy mountain water-supply project, broke their 1955 world record for daily advance through hard rock. The new mark stood at more than 90 ft. a day, compared with 67 ft. achieved in 1955.

In 1956, the Wilson tunnel in Honolulu, T.H., was finally holed through a short time after work was resumed early in the year. The 2,775-ft. vehicular tube through Koolau mountain was begun in 1954, but work ceased in August of that year because of a series of cave-ins.

Fresh ground-water floats on salt water under Oahu Island and the Hawaiians completed a unique horizontal water-collection tunnel, drilled at sea level, to skim off the fresh water without depressing it. Ordinary vertical wells tend to depress the ground-water table below sea level, causing salt water infiltration. The new tunnel, called a Maui type well, was 608 ft. long, 9 ft. wide and 7 ft. high.

Europe.—In England, work was begun on a 28-mi. tunnel that would carry water from the Thames river beneath London to the opposite side of the city. It was unique in that it was being lined by wedging together a number of curved pie-shaped concrete sections to form a cylinder 2 ft. long and 5 ft. in diameter. Each circular section of line was jacked against sections previously placed in the same manner. When the tunnel was completed the entire interior would be lined with a thin mortar layer for smoothness. Also in the London area, construction of a 4,700-ft., two-lane vehicular tunnel beneath the Thames was resumed, having been interrupted for 17 years by World War II.

In 1956 Sweden surpassed its own world record for hard-rock tunnelling at the Harresele hydroelectric project on the Ume river. In a huge 49 by 59-ft. horseshoe tunnel that would carry off water passing through the turbines, drillers removed a daily average of 31,725 cu.ft. of rock over a six-day period. The 1955 record was 29,300 cu.ft. Downstream from Harresele, progress continued on a second record-breaking tunnel, at the Stornorrfor

hydroelectric project. This tunnel, also for turbine water discharge, was the largest in cross section ever attempted, 53 ft. wide by 77 ft. high, for a total area of 3,875 sq.ft. Stornorrfor's tailrace tunnel is 2.5 mi. long.

North America.—Trouble was encountered in the 10-mi. Kemano tunnel in British Columbia which supplies water for Aluminum Company of Canada's turbines at Kitimat. Excessive pressure losses in the 25-ft.-high waterway, completed only a few years earlier, occurred in June and indicated the probability of an obstruction. Alcan officials planned to pump out the tunnel at a propitious time to accomplish repairs.

An unusual tunnel was begun from a small island in the inside passage to Alaska, between the Canadian mainland and Vancouver Island, to so-called Ripple rock, a hogsback of green basalt lying just beneath the water surface directly in the sailing lane. By means of 3,800 ft. of 7-ft.-diameter tunnel 100 ft. below ground, the Canadian government would gain access to Ripple rock to place explosive charges.

The top job of a construction boom in Cuba was an 1,800-ft. four-lane vehicular tunnel to connect Havana with undeveloped lands across the bay. For this undertaking, 360-ft. prestressed concrete-covered steel-shell sections were fabricated ashore as a twin tube then sunk in a prepared trench and linked with similar sections underwater. Each twin tube was 73 ft. wide and 24 ft. high.

Progress continued on three large vehicular tunnels in the United States. In New York, the \$100,000,000 shield-driven third tube of the Lincoln tunnel was holed through on June 28, and by the end of the year the concrete lining was well along. Digging in the last part of the 5,500-ft. bore was halted early in the year for about three weeks when 2,500,000 gal. of water burst into the tunnel through a crevice in overlying rock. The two other big tunnels were being constructed by the cut-and-cover method, similar to the Havana tunnel. One was beneath Baltimore harbour, a twin-tube four-lane structure 6,300 ft. long. The first 300-ft.-long, steel-shell concrete-covered twin tube was sunk in place on April 11. At Norfolk, Va., work continued on a single-tube, two-lane 6,900-ft. tunnel under Hampton Roads. Construction was similar to the Baltimore tunnel, even to the length of tube sections.

Work was begun on the 23-mi. Roberts tunnel (formerly called Montezuma tunnel) which would deliver west slope water across the continental divide to Denver, Colo. Completion was scheduled for 1962. Construction continued on the 44-mi., 11-ft.-diameter West Delaware tunnel, part of New York city's vast water-supply system. Upon completion, expected in 1960, it would be the second longest in the world, exceeded only by the 85-mi. Delaware Aqueduct which also supplies New York city with water.

Other major water tunnel activity included work on a 4-mi., 7-ft. horseshoe line serving New Haven, Conn.; completion of a 7-mi., 10-ft.-diameter tunnel for Boston, Mass.; 6 mi. of tunnel in Chicago; a 21-mi. supply line to San Francisco and a 1.3-mi., 10-ft.-diameter tunnel in southern California.

Activity on larger sewerage tunnels in 1956 included a 4-mi. sewage tunnel (completed) and a 7-mi. storm-water tunnel in Boston, a 4-mi. interceptor in Cincinnati, O.; construction began on a 1.3-mi. siphon beneath the Rouge river in Detroit, Mich., and on a 3.7-mi. outlook from Los Angeles' Hyperion treatment works. A 5-mi. interceptor to New York city's Bowery bay plant and an 8-mi., 13-ft.-diameter interceptor in Philadelphia were also completed.

At Oahe dam near Pierre, S.D., the upper halves of six 3,220-ft., 25-ft.-diameter slow-regulating tunnels were completed while a separate contract for the downstream portions was about 25% complete. The tunnels were excavated by a unique horizontal

boring machine that moved easily through the soft rock and clay. This drilling worked at a take greatly in excess of any previously achieved by other methods. (H. Jv.)

Turbojets and Turboprops: see AVIATION, CIVIL; JET PROPULSION.

Turkey. A republic in the southeastern Balkans and Asia Minor, Turkey is bounded west by the Aegean sea, northwest by Greece and Bulgaria, north by the Black sea, northeast by the U.S.S.R., east by Iran and south by Iraq, Syria and the Mediterranean. Area: 303,052 sq.mi. Pop.: (1950 census) 20,947,188; (1955 preliminary) 24,111,778. Language (1950): Turkish 87.3%; Kurdish 8.8%; also Arabic, Greek, Armenian, Georgian and Jewish (Spaniol). Religion (1945): Moslem 98%; Christian 1%; Jewish 0.4%. Chief towns (pop., 1955 preliminary census): Ankara (cap.) 453,151; Istanbul 1,214,616; Izmir (Smyrna) 286,310; Adana 172,465; Bursa 131,336; Eskisehir 122,755. President of the republic in 1956, Celal Bayar; prime minister, Adnan Menderes.

History.—Home Politics.—The year 1956 began with acute tension in interparty relations. It seemed likely that the revolt among the rank and file of the Democratic party against a too centralized leadership would assert itself further, that there would be desertions to join the new Hurriyet (Freedom) party which had split off from the government party and that the three opposition parties would co-operate closely to bring about more effective parliamentary control.

However, Adnan Menderes, the prime minister, succeeded in reaffirming his authority in the party. The rebels of Nov. 29,



FORMER TURKISH PRESIDENT Ismet Inonu, 72, taking a plunge from a pier at Heybeli, a resort island near Istanbul, in Aug. 1956

1955, with few exceptions, became subdued and backed up both the economic policy of the government (which they had attacked so bitterly) and the restrictive laws against party activities and the press. The parliamentary commissions of investigation, which were set up to ascertain whether or not there had been irregularities in the handling of public business by four former ministers, came out with verdicts of acquittal against the charges. On June 20, the foreign minister, Fuad Köprülü, resigned from the government to mark his disapproval of the acquittal of one of the four former ministers involved.

The restrictions against freedom of discussion passed by parliament on June 6 and June 24 included heavy prison terms, fines up to £T100,000 and obligations to integrally publish answers in the same column of the page in the same size characters as the original story which had involved any authority or individual and caused his objection or resentment. On June 27 parliament passed a law forbidding open air meetings and party demonstrations outside of a limited period during electoral campaigns. These laws were passed by 281 votes out of a total of 540. The opposition parties left parliament after a vehement criticism of the restrictive measures and jointly kept away for several weeks. A discussion of the Cyprus problem created an occasion for them to reappear in parliament.

Nevertheless, the situation in Turkey was hardly as bad as was generally assumed in the free world. There was no censorship of the press; opposition leaders were free to speak before their party organizations and conventions, and they were usually accompanied by a large group of journalists who fully reported their speeches. Newspapers could criticize anything in moderation, including the existence of restrictions.

The general trend was toward an easing of the situation. The government on the one hand, the independent and opposition editors on the other had remained out of contact for months. On Sept. 28 they met at an elaborate lunch which took the form of a sort of peace conference between the government and the press with the participation of leading majority members in parliament, progovernment editors, leading civil servants and presidents of important banks and corporations. The prime minister gave details about a plan of radical improvements undertaken in Istanbul (mainly concerning traffic); he also promised that similar meetings would be held each month to maintain a relationship based on goodwill and to supply the press with inside information. Attempts to form an opposition coalition failed. The three parties agreed among themselves about aims, but not about methods to attain them nor about the division of seats in a new election.

Foreign Affairs.—Turkey continued its policy of moderation apropos of middle eastern affairs, making efforts to prevent a break between Great Britain and the other three Baghdad pact powers. In the Suez crisis Turkey put emphasis on the acuteness of the danger caused by the U.S.S.R.'s obtaining a foothold in the middle east and the Mediterranean, in close alliance with the pan-Arab and pan-Moslem dream of hegemony of Gamal Abdel Nasser. There was an inclination to excuse the British-French intervention, although its form was found objectionable.

The Balkan pact continued to remain paralyzed. Pres. Celal Bayar, speaking on Nov. 1, said that both Turkey and Yugoslavia wished its revival. Encouraging words were used in the same speech about attempts to be made to find solutions for the grave conflict between Turkey and Greece arising out of the Cyprus question and the resurrection (in the Turkish opinion) of the old policy of Byzantine imperialism, so dear to the Greek Orthodox Church. Relations between Turkey and Greece remained cold. (See CYPRUS; GREECE.)

Turkish reaction to the new British constitutional proposals concerning Cyprus (Dec. 19), were altogether favourable. Speak-

ing on Dec. 28 in the Grand National Assembly, Adnan Menderes insisted that Turkey paid attention not to self-government but to the island's eventual status. If the principle of self-determination was applied, it would be applied fully; that is, both the Turks and the Greeks on the island would have the right to determine their fate freely. Turkey would then favour partition of the island.

Important foreign visitors to Turkey during the year included Dag Hammarskjöld (Jan. 19), Selwyn Lloyd (March 12), the shah of Iran and the empress Soraya (May 15), the U.S. vice-president, Richard M. Nixon (July 10), the president of Pakistan, Maj. Gen. Iskander Mirza (July 15), and King Idris of Libya (Aug. 6).

Economic Position.—Hopes in Turkey that a large U.S. loan would be forthcoming did not materialize. This did not deter the government, however, from proceeding with its ambitious program of equipping Turkey, as fast as possible, with new roads, harbours, flood control and irrigation systems, power stations, new sugar, cement and textile factories, hospitals, two new universities (at Erzurum and Izmir) and public building and private housing schemes.

Drastic laws were promulgated by parliament against profiteering and high living costs. Under the threat of severe punishment, traders decided to comply with the new regulations. This often meant sales at a loss, as the former large profit margins had allowed them to import at high prices.

Although the government refused to devalue the Turkish lira, a premium of about 100% was accepted for foreign money imported by tourists. This new scheme, which already existed for air fares, was extended to other fields. Turkish tourists in foreign countries would obtain foreign exchange permits at the new tourist rate.

(A. E. Y.)

Education.—Schools (1954): primary 18,058, including 2,220 3-yr. village schools, pupils 1,749,517, teachers (state) 33,250; junior high 507, pupils 95,999; secondary 113 (34 private), pupils 32,778, teachers (state, including junior high) 6,291; vocational 190, pupils (1952-53) 38,500, excluding schools of agriculture, fine arts, hygiene and other professional schools which in 1951-52 numbered 28, with 4,400 pupils; teacher training 34, pupils 16,346, teachers 745. Institutions of higher education 16, students 24,700 (2 universities with 5,700 students).

Finance and Banking.—Monetary unit: Turkish pound or lira, with an official rate of £2.80 to the U.S. dollar. Budget: (1955-56 est.) revenue £3,091,266,397, expenditure £3,091,262,815; (1956-57 est.) revenue £3,362,800,000, expenditure £3,362,800,000. Internal debt (Dec. 1955) £2,555,108,000, external debt £1968,416,000. Currency circulation (March 1955) £11,631,480,000, (March 1956) £12,050,036,000. Deposit money (March 1955) £716,167,000, (March 1956) £859,206,000. Gold and foreign exchange, central bank (March 1954) 214,000,000 U.S. dollars, (March 1956) 218,000,000 U.S. dollars.

Foreign Trade.—(1955) Imports £11,393,400,000, exports £877,400,000. Main sources of imports: Germany 18%; other continental European Payments Union countries (E.P.U.) 16%; U.S. and Canada 22%; U.K. 8%. Main destinations of exports: Germany 16%; other continental E.P.U. 26%; U.S. and Canada 16%; U.K. 7%. Main exports: tobacco 28%; cotton 15%; hazelnuts 14%.

Transport and Communications.—Roads (1954) 45,760 km. Motor vehicles in use (Sept. 1954): passenger 28,060, commercial 34,040. Railways (1955): 7,900 km.; traffic (state railways, 1955) passenger-km. 3,917,328,000; freight, ton-km. 4,165,632,000. Shipping (July 1954): merchant vessels of 100 gross tons and over 274; total tonnage 488,000. Air transport (state air lines, 1955): passenger-km. 68,652,000; freight, ton-km. 1,236,000. Telephones (Jan. 1955) 132,465; radio receiving sets (Nov. 1955) 999,800.

Agriculture.—Production (metric tons, 1955; 1954 in parentheses): wheat 7,216,000 (5,010,000); barley 2,985,000 (2,400,000); oats 356,000 (325,000); maize 864,000 (914,000); rye 657,000 (470,000); potatoes (1954) 1,116,000, (1953) 1,000,000; millet 92,000 (88,000); tobacco 117,500 (100,000); lint cotton 157,000 (142,000); cottonseed 285,000 (260,000); linseed 16,000 (15,000); sunflower seed 135,000 (120,000); sesame 50,000 (48,000); hemp fibre 11,000 (12,100); chick peas 76,000 (75,000); dry beans 114,000 (105,000); lentils 77,000 (64,000); oranges, tangerines, etc., 149,000 (148,000); lemons, limes, etc., 30,000 (27,000); grapes 1,895,000 (2,248,000); raisins (1954) 120,000; raw beet sugar 268,000; olive oil 30,000; wool 20,000; meat (1952): beef, veal 43,614 (including buffalo meat 3,901); mutton, lamb 49,763; pork (1951) 110,000; rice (1954) 176,000, (1953) 174,000. Livestock (Sept. 1955): cattle 10,867,000; sheep 26,808,000; horses 1,214,000; mules 117,000; asses 1,710,000; buffaloes 1,071,000.

Industry.—Fuel and power (metric tons, 1955): coal 5,496,000; lignite (state mines only) 1,805,376; crude oil (1954) 59,000; electricity 1,455,600,000 kw.hr. Production (metric tons, 1955): iron ore (65% metal content, state mines) 427,200; pig iron 200,400; crude steel 188,400; blister and refined copper 23,640; sulphur (state) 11,496; cement 816,000; superphosphates 66,444; manganese (48%-50% metal content, 1954)

47,064; chrome ore (state mines) 173,148, (total, 1954) 523,632; manufactured tobacco 25,284; cotton yarn (state only) 25,816, (private, 1952) 16,728; woven cotton fabrics (state only) 145,744,000 metres, (private, 1952) 65,724,000 metres; wool yarn (state only) 4,320 metric tons (total, 1954) 10,200 metric tons.

ENCYCLOPEDIA BRITANNICA FILMS.—*The Middle East* (1955); *Turkey* (1955).

Turkeys: see LIVESTOCK.

TVA: see TENNESSEE VALLEY AUTHORITY.

Twentieth Century Fund: see SOCIETIES AND ASSOCIATIONS, U.S.

Twining, Nathan Farragut (1897—), U.S. air force officer, was born at Monroe, Wis., on Oct. 11 and was graduated from the U.S. Military academy at West Point, N.Y., in 1919. Trained for the infantry, he later transferred to the U.S. air corps and studied at the corps's tactical school in 1935-36 and at the Command and General Staff school, Ft. Leavenworth, Kan., in 1936-37.

During World War II Twining served in the Pacific as commander of the 13th air force in the Solomon Islands in 1943, in the Mediterranean area as commander of the 15th air force in Italy in 1944-45, and again in the Pacific in 1945 as commander of the 20th air force based in the Marianas.

In 1950, after serving as commander in chief of the Alaskan military defenses, Twining was appointed vice-chief of staff, U.S. air force, and was promoted to the rank of four-star general. In 1952 he became head of the strategic air command. In 1953 Pres. Dwight D. Eisenhower named him chief of staff, U.S. air force, and he was nominated for his second term in 1955.

During his terms of office Twining repeatedly called for increases in air force appropriations, particularly for new and improved weapons. Following a limited inspection visit to the U.S.S.R. in June 1956 at the invitation of soviet leaders, he intimated that Russian production of new military planes exceeded that of the United States.

Uganda: see BRITISH EAST AFRICA.

Ulcer: see STOMACH AND INTESTINES, DISEASES OF THE.

Unemployment: see CENSUS DATA, U.S.; EMPLOYMENT.

Unemployment Insurance: see SOCIAL SECURITY.

UNESCO (United Nations Educational, Scientific and Cultural Organization): see EDUCATION; LIBRARIES.

Union of American Republics: see ORGANIZATION OF AMERICAN STATES.

Union of South Africa: see SOUTH AFRICA, THE UNION OF.

Union of Soviet Socialist Republics. This federation of soviet socialist republics is a state covering parts of eastern Europe and of northern and central Asia. Area (1939) 8,173,557 sq.mi.; (1946) 8,598,678 sq.mi., including 1,969,110 sq.mi. (23%) in Europe. Pop. (1939 census) 170,467,572; (1956 est.) 200,200,000, including 138,200,000 (69%) in Europe. Nationalities (1956 est.): Russians about 52.3% of pop.; Ukrainians 18.3%; Byelorussians 3.5%; the strongest non-Slavonic groups were the Turkic (11.3%) and Finno-Ugrian (2.7%) peoples. Religion: Russians, Ukrainians, Byelorussians and Rumanians (Moldavians) are Greek Orthodox; Lithuanians and Poles are Roman Catholic (2.3%); Latvians, Estonians, Germans and Finns are mainly Lutheran; there were about 5,000,000 Protestants of all denominations; 2,763,000 Georgians have their own autocephalous Orthodox Church; 2,662,000 Armenians are Christian; Jews were estimated (1956) at 1,902,000; the indigenous inhabitants of Azerbaijan, the five central Asian soviet socialist republics and many autonomous republics (Tatar, Bashkir, Daghestan, etc.)

are Moslem (number, 1956 est., 24,500,000); Buryats and Kalmyks are Lamaist Buddhist (about 500,000). Chief towns (pop., 1956 est.): Moscow (cap.) 4,389,000; Leningrad 2,814,000; Kiev 991,000; Kharkov 877,000; Gorky 876,000; Tashkent 778,000; Kuybyshev 760,000; Novosibirsk 731,000; Sverdlovsk 707,000; Tbilisi 635,000; Stalino 625,000; Chelyabinsk 612,000; Odessa 607,000; Baku 598,000; Dnepropetrovsk 576,000; Kazan 565,000; Riga 565,000; Rostov 552,000; Molotov 538,000; Stalingrad 525,000; Saratov 518,000; Omsk 505,000. First secretary of the Communist Party of the Soviet Union in 1956, Nikita S. Khrushchev (*q.v.*); chairman of the presidium of the supreme soviet of the U.S.S.R., Marshal K. E. Voroshilov; chairman of the council of ministers, Nikolai A. Bulganin (*q.v.*).

Union of Soviet Socialist Republics

Republic	Capital	Area (sq.mi.)	Population (1956 est.)
Russian S.F.S.R.	Moscow	6,592,443*	113,200,000
Ukraine	Kiev	232,618	40,600,000
Kazakhstan	Alma-Ata	1,063,242	8,500,000
Byelorussia	Minsk	80,154	8,000,000
Uzbekistan	Tashkent	157,336	7,300,000
Georgia	Tbilisi (Tiflis)	29,488	4,000,000
Azerbaijan	Baku	33,089	3,400,000
Lithuania (<i>q.v.</i>)	Vilnius (Wilno)	25,174	2,700,000
Moldavia	Chisinau (Kishinev)	13,050	2,700,000
Latvia (<i>q.v.</i>)	Riga	24,903†	2,000,000
Kirghizia	Frunze	76,023	1,900,000
Tajikistan	Stalinabad	55,058	1,800,000
Armenia	Erivan	11,506	1,600,000
Turkmenistan	Ashkhabad	187,181	1,400,000
Estonia (<i>q.v.</i>)	Tallinn (Reval)	17,413‡	1,100,000
		8,598,678	200,200,000

*Excluding the Crimea, from Feb. 19, 1954, part of the Ukraine, but including Karelia, which on July 16, 1956, was included into the Russian S.F.S.R.

†Before 1940 the area of Latvia was 25,395 sq.mi.

‡Before 1940 the area of Estonia was 18,359 sq.mi.

Source: Areas are taken from the *Bolshaya Sovetskaya Entsiklopedia: Soyuz Sovetskikh Sotsialisticheskikh Respublik* (Moscow, 1948), and population estimates from *Narodnoye Khozyaistvo S.S.S.R.* (Moscow, 1956). The order, as in the originals, is according to the number of population.

History.—The Party.—The 20th congress of the Communist Party of the Soviet Union, held in Moscow from Feb. 14 to 25, 1956, was the outstanding event of the year. It marked the first serious attempt of the Soviet leaders to face up publicly to the problem of dissociating themselves completely from Stalin and his methods and of ruling the Soviet empire without him. The repercussions of the congress on the stability of the communist system inside the U.S.S.R. and beyond its borders were still being felt at the end of the year.

The first published reports of the congress did not indicate any major departure from accepted policy and the proceedings followed the normal rigid pattern established under Stalin. The principal report to the congress was delivered by Khrushchev, the first secretary, in a six-hour speech on the opening day. The greater part of this speech, which reviewed the whole of Soviet policy, contained little that was new or unexpected. The only novelties were declarations that wars were no longer "inevitable" and that socialism might be achieved in modern conditions in certain countries by parliamentary means and without resort to violence.

It was noted that, although the congress was the first to be held since Stalin's death, Khrushchev made only one passing reference to the dictator in his long speech. He made only indirect reference to Stalin's rule when he denounced the "cult of the individual" and stressed the collective nature of the Soviet leadership, which, he said, was not "a group of men bound by personal relations or mutual advantage." It was "a working collective of leaders whose relations are based on ideas and principles permitting of neither mutual forgiveness nor personal antagonism." But other members of the party presidium who spoke later, notably M. A. Suslov and A. I. Mikoyan, made outspoken criticisms of Stalin by name. It was not until the middle of March that news leaked out to the western press that, at a closed session at the end of the congress, Khrushchev had made a violent denunciation of Stalin and the later years of his rule. The text of

this speech was never published in the U.S.S.R., though it was reported to have been read out at party meetings throughout the country. A version made available in the west by the U.S. state department was generally accepted as an accurate account of the speech and was never questioned by the Soviet authorities.

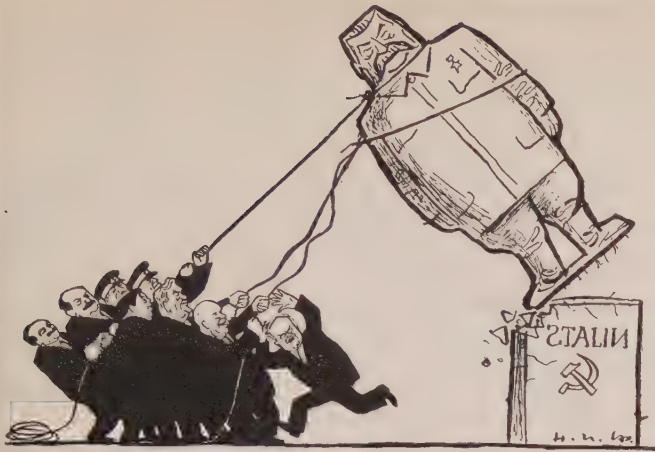
The speech was a denunciation of Stalin's autocratic and brutal methods of ruling, especially after the 17th congress of the party in 1934. Khrushchev began by recalling the doubts that Lenin had expressed on the eve of his death about Stalin's suitability for the post of general secretary and his criticism of his "rudeness." (The full text of Lenin's political "testament" and of other documents throwing light on Lenin's relations with Stalin was distributed to delegates at the congress.) He described Stalin's demand for "absolute submission" to his opinions and his "moral and physical destruction" of all who opposed him. He revealed that 98 of the 139 members of the party central committee elected at the 17th congress were later arrested and shot. He said that Stalin had carried out "purges" on the basis of lists of potential victims drawn up arbitrarily by the secret police, that he had extracted confessions from the victims by means of torture and that he had later ordered the deportation of whole national minorities. He ridiculed Stalin's claim to be a great military leader and said he had been responsible for the initial Soviet defeats in World War II and for large and unnecessary losses of men. He said Stalin was responsible for the breach of Soviet-Yugoslav relations in 1948. It was on Stalin's orders that the "doctors' plot" had been fabricated in 1953. He gave many examples of Stalin's extraordinary personal vanity. In conclusion he indicated that Stalin had intended in the last year of his life to destroy the senior members of the party leadership and said that, had Stalin lived a few more months, V. M. Molotov and Mikoyan might have been among the victims.

Apart from its bitter and highly personal denunciation of Stalin the speech contained little in the way of reasoned argument and bore many signs of having been put together hastily. This supported the view that it was only during the congress that the decision to make a complete break with Stalinism was taken. It was noted, however, that Khrushchev approved Stalin's suppression of the political opposition associated with L. D. Trotsky, G. E. Zinoviev and N. I. Bukharin, his collectivization of Soviet agriculture in the early 1930s and his policy of rapid industrialization.

Despite the disturbing effects of this speech in other communist countries (see POLAND; HUNGARY) the process of "de-Stalinization" in the Soviet Union was not noticeably accelerated. The worst aspects of the Stalinist terror had already been abated before 1956; the powers of the security services had been curtailed and the population of the concentration camps reduced. Thus an announcement in Feb. 1956 revealed that the so-called "troika"—the secret tribunal of the ministry of internal affairs which had arbitrary powers to punish political offenders—had been abolished in 1953. Though there were no direct references to the exodus from the camps in the Soviet press, there were reliable reports that the number of persons released ran into millions.

But there was little evidence of positive de-Stalinization in the sense of greater democratic freedom. The Communist party remained as rigidly disciplined as ever. The press remained the mouthpiece only of the party and government. Nor was there any relaxation of economic policy in favour of the consumer; concentration on heavy industry remained the main slogan and the pressure for the collective system in agriculture was unabated. Toward the end of the year there were some small signs of protest among the students of Moscow and Leningrad and evidences of discontent among writers in the Ukraine.

The elections at the end of the congress produced no major



"COLLECTIVE LEADERSHIP AT WORK," a 1956 cartoon from *Die Weltwoche*, Zürich, Switz.

changes in the party leadership. The 11 "full" members of the governing presidium were all re-elected, with no additions. They were: Bulganin, Voroshilov, L. M. Kaganovich, A. I. Kirichenko, G. M. Malenkov, Mikoyan, Molotov, M. G. Pervukhin, M. Z. Saburov, Suslov and Khrushchev. The most significant innovation was the appointment of Marshal G. K. Zhukov, the minister of defense, as first of the "candidate" members of the presidium. This was the first time a purely military figure had been admitted to the political leadership. Four further candidate members were appointed: L. I. Brezhnev, N. A. Mukhitdinov, D. T. Shepilov and Ekaterina A. Furtseva. Brezhnev and Mrs. Furtseva were also made members of the eight-man secretariat of the central committee. Khrushchev remained first secretary. The new central committee, consisting of 133 full members and 122 candidate members, contained 102 entirely new names. More than a third of the members elected in 1952 were removed. The overwhelming majority of the members were full-time party officials; representation of the armed forces and security organizations showed a slight decline.

Immediately after the congress the creation of a special party bureau for the affairs of the Russian federation of the U.S.S.R. was announced. Khrushchev was made chairman of the bureau, which was to ensure "more efficient management of economic and cultural questions in the R.S.F.S.R." The bureau later began publication of a new daily newspaper, *Sovietskaya Rossiya*.

The Government.—In July a reorganization of certain branches of the economic administration was made with the avowed purpose of giving the constituent republics greater influence over the planning and management of their economies. Branches principally affected were those connected with the production and distribution of food, light manufactured goods and textiles.

The main change in the composition of the government of the U.S.S.R. was the release in June of Molotov from his duties as minister of foreign affairs. He had been directly concerned with the formulation and conduct of Soviet policy for 15 years. His removal was believed to be connected with the restoration of Soviet-Yugoslav relations, to which Molotov was known to have been opposed. Despite his removal from the ministry Molotov was a member of the delegation which visited Warsaw in October and was rebuffed by Wladyslaw Gomulka. Shortly after this event Molotov was made minister of state control, a gesture apparently intended to signify his complete detachment from the conduct of foreign affairs. He was succeeded as foreign minister by D. T. Shepilov (*q.v.*), former editor of *Pravda* and a party secretary.

The more important governmental appointments during the year were: N. P. Dudorov, a party official, replaced Gen. S. N. Kruglov as minister of internal affairs; N. M. Shvernik was re-

placed as chairman of the central council of trade unions by V. V. Grishin, but remained a candidate member of the party presidium; L. M. Kaganovich ceased to head the committee on labour and wages but took over the duties of minister of the building materials industry. Three new deputy foreign ministers were appointed, V. A. Zorin, N. S. Patolichev and A. V. Zakharov.

On July 16 the presidium of the supreme soviet announced the abolition of the Karelo-Finnish soviet socialist republic and its conversion to the status of Soviet autonomous republic forming part of the Russian federation.

There were no major "purges" during the year. But on May 27 it was revealed in a Baku newspaper that M. D. Baghirov, for 20 years leader of the Azerbaijani Communist party, had been tried and condemned to death for alleged complicity with L. P. Beria, the former secret police chief. He was shot along with three other men.

The Armed Forces.—The principal military appointments during the year were those of Army-Gen. A. I. Antonov as secretary-general of the Political Consultative committee of the Warsaw treaty powers; of Marshal R. Malinovsky as commander in chief of the Soviet land forces in succession to Marshal Ivan Koniev; and of Marshal K. K. Rokossovsky as deputy minister of defense. Admiral of the Fleet N. G. Kuznetsov, the former minister of the navy and subsequently its commander in chief, was not re-elected to the central committee of the Communist party in February and disappeared from public life. His position as commander in chief appeared to have been taken by Adm. S. G. Gorshkov, the only naval representative on the central committee.

In May the government announced a further reduction in the size of the armed forces by 1,200,000 men by May 1957. It was said that 63 divisions would be disbanded, including about 30,000 men stationed in the German Democratic Republic. Exchanges between Bulganin and Pres. Dwight D. Eisenhower on disarmament continued, without producing any practical results.

National Economy.—Several measures calculated to alleviate slightly the lot of the industrial workers were introduced. The working week was reduced from 48 to 46 hours and a six-hour day introduced for young workers between the ages of 16 and 18; maternity leave was increased from 77 to 112 days; a new law was passed regulating pensions which would now range from 300 to 1,200 roubles a month; and the minimum monthly wage was raised from 260 to 370 roubles, a measure estimated to affect more than 8,000,000 people, or one-sixth of the labour force.

The targets set for agriculture by the sixth five-year plan, which the supreme soviet adopted in February, included the reclamation and cultivation of 75,000,000 ac. of new agricultural land begun in 1955, the raising of the gross grain harvests to 180,000,000 tons by 1960 and the doubling of the output of meat and dairy produce by the same date. An important part in achieving these targets was to be played by the new areas in Siberia and Kazakhstan, where Khrushchev attended conferences of agricultural specialists during the summer. Soviet authorities claimed that, despite delays resulting from bad weather in the east and north, the 1956 grain harvest was the richest in Soviet history. This claim suggested that the gross harvest was in the region of 110,000,000 tons. About 220,000 young Communists were sent from the towns to help in the harvest.

In August the government announced plans to irrigate, in the course of the five-year period 1956-62, 741,000 ac. of the region known as the Hungry steppe in the Uzbek and Kazakh republics. This was expected to raise the annual output of cotton from the area by about 330,000 tons.

No improvement in the efficiency of the collective farm system was recorded and in March a move was made to reverse the conciliatory attitude toward the peasants that followed Stalin's death

in 1953. The managers of the farms were empowered to fix the size of the members' private plots in proportion to the amount of work performed for the collective and to reduce the size of the plots at their own discretion.

Foreign Affairs.—The Soviet Union's relations with its eastern European satellites suffered serious deterioration during the year, and the purely military nature of Soviet control of the area was exposed. The less certain direction provided by the "collective" leadership in Moscow led to a reduction in the prestige and authority of the communist leaders of eastern Europe. Revolts broke out in Poland in June and in Hungary in October. In both cases the Soviet leaders resorted to military force. Soviet tanks were used to quell the rioters in Poznan and a large number of Soviet armoured divisions were sent to Hungary to enforce Soviet control. In Poland an alternative communist leadership was found, under Gomulka, to resist Soviet demands while preserving the Soviet alliance. In Hungary no such alternative was available.

There were reports of discontent in the other satellite countries, but no serious disturbances. On Oct. 30, on the eve of the second entry of Soviet troops into Hungary, the Soviet government issued a declaration admitting errors committed in its relations with its allies and promising to revise them in future. In the sense of this declaration Poland received the promise of substantial economic aid after negotiations in November. The dissolution of the Cominform and the cessation of its journal were announced in April.

Despite the setback to Soviet positions in eastern Europe, Soviet foreign policy became increasingly active in the middle east. The supply of arms to Egypt, which was one of the main sources of the Suez crisis, was followed by the threat to dispatch "volunteers" following the British-French action there. There was evidence of Soviet penetration of other middle eastern countries, notably Syria. Shepilov, the foreign minister, made an extensive tour of the middle east in June.

The Soviet government handed the Porkkala naval base back to Finland in January. In April Bulganin and Khrushchev paid a state visit to Great Britain, where they were received by the queen. Malenkov also visited Great Britain in his capacity as minister of power stations. Marshal Tito, president of Yugoslavia, was received on a state visit in Moscow in June. His talks with the Soviet leaders resulted in their grudging and imprecise acceptance of the right of other Communist parties and countries to pursue their specific paths to "Socialism." When the crisis in eastern Europe developed, Khrushchev visited Yugoslavia privately to consult Tito, who accompanied him to the Crimea for further talks. The Yugoslav leader later exposed the nature of the conflicts of opinion among the Soviet leaders and was severely criticized by the official newspaper *Pravda*.

The Soviet Union established diplomatic relations with Cambodia, the Sudan and the Yemen, and reached agreement on their establishment with Liberia, Ceylon and Japan. It recognized Moroccan and Tunisian sovereignty. The Soviet ambassador to Israel was recalled in November. Soviet consulates in South Africa were closed at the request of the South African government.

(See also ANTARCTICA; ATOMIC ENERGY; COMMUNISM; RUSSIAN LITERATURE; UNITED NATIONS.) (D. Fd.)

Education.—Schools (1955-56): primary 179,000, secondary 34,000, all pupils 30,070,000, all teachers 1,733,000; vocational 3,757, pupils 1,961,000; institutions of higher education 765 (including 31 universities), students 1,867,000, including 1,228,000 taking correspondence courses.

Finance.—Budget: (1955 est.) revenue 590,192,622.000 roubles; expenditure 563,482,491.000 roubles; (1956 est.) revenue 592,761,156.000 roubles; expenditure 569,634,972.000 roubles. Investments from the state budget in the national economy in 1956 amounted to 237,325,529.000 roubles, and in addition, from the enterprises' and economic organizations' own funds, 109,658,670.000 roubles. External value of the rouble, high and fictitious: U.S. \$1 = 4 roubles.

Foreign Trade.—(UN Economic Commission for Europe's estimates, in U.S. dollars, 1954.) Trade turnover with all countries \$6,250,000,000. Trade with the countries of the Communist group \$4,900,000,000, including \$1,100,000,000 with the German Democratic Republic, \$720,000,000 with Czechoslovakia, \$660,000,000 with Poland, \$330,000,000 with Rumania, \$280,000,000 with Hungary and \$200,000,000 with Bulgaria. Trade with China, Mongolia and Northern Korea amounted to \$1,610,000,000.

Transport and Communications.—Railways (1955): 120,700 km., including 5,400 km. electrified; passenger traffic 1,641,400,000 persons and 141,400,000,000 passenger-km.; freight carried 1,267,000,000 metric tons and 970,900,000,000 ton-km. Highways (1955, hard surface only) 206,900 km. Motor vehicles in use (1955): cars 350,000, commercial 2,525,000. Shipping (July 1954): vessels of 100 gross tons and over 1,113, gross tonnage 2,381,000. Telephones (1936, last figure published) 861,200. Radio receiving sets (1955) 6,100,000; television sets 820,000.

Agriculture.—Main crops (metric tons, 1950; 1955 estimates or plan in parentheses): grain 99,700,000 (129,000,000); sugar beets 21,400,000 (31,400,000); potatoes 87,000,000 (plan: 147,800,000); cotton, unspinned, 3,400,000 (3,700,000). Livestock (1950; 1955 estimates in parentheses): cattle 57,200,000 (67,100,000); pigs 24,100,000 (52,200,000); sheep and goats 99,000,000 (124,900,000, sheep only); horses 13,700,000 (1955 plan: 16,400,000).

Industry.—Production (metric tons if not otherwise stated, 1950; 1956 est. in parentheses): coal, including lignite, 261,000,000 (430,000,000); crude petroleum 37,800,000 (84,000,000); electricity 91,000,000,000 (192,000,000,000) kw.hr.; pig iron 19,400,000 (1955: 34,000,000); steel 27,300,000 (49,000,000); cement 10,100,000 (1955: 22,700,000). Light engineering (1955, units): bicycles 2,880,000; sewing machines 1,610,000; washing machines 87,000; refrigerators 151,000; radio sets 3,530,000; television sets 490,000; cameras 1,020,000; clocks and watches 19,700,000. Textile and shoe production (1955): cotton fabrics 5,904,000,000 m.; linen fabrics 305,000,000 m.; woollen fabrics 251,000,000 m.; silk fabrics 526,000,000 m.; leather shoes 299,000,000 pairs. Foodstuffs production (1955): meat 2,219,000 metric tons; sausage products 83,000 tons; fish, catch, 2,675,000 tons; butter 436,000 tons, cheese 105,300 tons, margarine 364,000 tons; vegetable oil 1,115,000 tons; sugar 3,419,000 tons; wine 3,450,000 hl.

Unitarian Church. During 1956 the membership of the Unitarian churches and fellowships in the United States passed 100,000. One hundred and ninety fellowships had been organized and would become churches when they numbered 65 families each and had the ability to support a minister. The church school enrolment was almost seven times that for adults. Funds raised during the year represented an increase of 12% over the previous year.

Without prior arrangement, the theme of the annual meetings of Unitarian organizations in Boston, Mass., in May proved to be the matter of brotherhood (race relations), as it had come to a crisis in American life. Distinguished Negro Americans were among the speakers. Martin Luther King Jr., of Montgomery, Ala., was given the award of the Unitarian Fellowship for Social Justice. Resolutions urging the findings of ways to abolish segregation in its various forms were passed by the several organizations. Of churches responding to a questionnaire, 52% reported Negroes attending and participating as church members, members of governing bodies, church school teachers, ushers, hostesses, etc.

Other social concerns resulted in resolutions for the repeal of the Walter-McCarran act, abolition of the death penalty for federal offenses, greater emphasis on working through the United Nations as a national policy, urging the U.S. to take the initiative through the UN for a universal pact against the testing of atomic and hydrogen weapons, furthering international exchange of ideas and visits with peoples of other nations, increased allocations by all levels of government for the support of public schools, and commending the Freedom Agenda project for its study of American constitutional liberties.

Of outstanding concern was a report already adopted by the Universalist Church of America authorizing the appointment of a merger commission to draw up plans for merger, with other possible alternatives. This report was adopted with an overwhelming (469-65) vote; also a resolution that an independent research firm make an investigation of the operation of all the organizations that would participate in such a merger and the results to be distributed to the churches before any plebiscite.

H. Clay Burkholder of Lancaster, Pa., was elected moderator of the denomination. The climax to the meetings was the anni-

versary banquet, at which John Howland Lathrop of Brooklyn, N.Y., was given the eighth Unitarian award for distinguished service to the cause of liberal religion, the first active Unitarian minister to receive it.

(J. H. L.)

United Church of Canada. The United Church of Canada, which in 1925 united the Presbyterian Church in Canada, the Methodist Church (Canada) and the Congregational Churches in Canada, had under pastoral care during 1956, 2,265,585 persons. The membership reported for 1954 was 894,556, and 37,536 members were added during 1955 on profession of faith. There were 5,289 Sunday schools with 658,633 enrolled scholars in 1956, and a Sunday School in the Home—by Mail and Air, with 2,382 families enrolled. The total value of local church property was \$246,175.936, with liabilities of \$12,905,624.

In addition to seven theological colleges and three universities, there was in 1956 a training school for full-time women workers and nine residential secondary schools (junior colleges). In all 9,047 students were in attendance, 632 of whom were candidates for the ministry. There were four residential training schools for lay workers.

Givings to the missionary and maintenance fund (unified budget for missions and benevolences) were \$4,608,866 in 1955. The Woman's Missionary society raised for its work \$1,237,706, and \$4,604,862 was raised by the woman's associations. The total giving for all purposes was \$39,445,516, or \$2,707,875 above the previous year.

The United Church of Canada added 3 new homes for senior citizens in 1955, making 15 in all; maintained 6 homes for girls; completed the second stage and laid plans for the final stage of the National Evangelistic mission; received a delegation of representatives from the Russian Orthodox Church, and sent a delegation in return. The church opened a new modern radio, television and film studio, with complete technical staff and equipment.

During 1955 the United Church gave \$137,837 for interchurch aid and overseas relief, and sent 165 tons of clothing to Korea and Lebanon. The United Church maintained 95 missionaries and 10 other workers in seven countries; published an official paper, 5 weekly story papers and 20 quarterlies; owned and operated the Ryerson Press, oldest and largest book publishing house in Canada; carried on religious work in defense areas, construction and logging camps; owned and operated seven hospitals and a fleet of five mission boats.

(See also CHRISTIAN UNITY.)

(A. J. WN.)

United Fund: see COMMUNITY CHEST—UNITED FUND.

United Kingdom: see GREAT BRITAIN & NORTHERN IRELAND, UNITED KINGDOM OF.

United Nations. Sec.-Gen. Dag Hammarskjöld expressed hope in 1955 "that solid progress can be made in the coming years in developing new forms of contact, new methods of deliberation and new techniques of reconciliation" to settle international issues. As outbreaks of violence seriously disturbed both the communist and noncommunist worlds during 1956, the United Nations was increasingly called upon to utilize all facilities at its disposal to maintain peace. A new trend in the organization toward quiet diplomacy, mediation and good offices to supplement voting procedures and sharp debate asserted itself clearly. Major problems endangering peace and security were increasingly brought for settlement to the general assembly. Although unrestricted faith in the organization's ability to preserve peace was not upheld by all members, it nevertheless seemed evident that the UN carried a moral force in the

international community that no power could wholly ignore. Attention was focused primarily on questions of colonialism and peaceful change; matters bearing on east-west relations seemed to necessitate less immediate consideration.

Membership and Representation.—On Dec. 14, 1955, 16 new members were admitted into the United Nations by the general assembly: Albania, Jordan, Ireland, Portugal, Hungary, Italy, Austria, Rumania, Bulgaria, Finland, Ceylon, Nepal, Libya, Cambodia, Laos and Spain. During 1956 the Security council also recommended the admission of the Republic of the Sudan, Morocco, Tunisia and Japan to the UN. Final confirmation of the membership of these countries was made by the general assembly at its 11th session.

Although a number of governments continued to oppose the representation of the Republic of China in the UN by the nationalist government, a majority of states in the assembly voted not to consider any proposals on the matter during the tenth session.

Organization and Meetings.—The tenth session of the general assembly, which convened at UN headquarters on Sept. 20, 1955, adjourned on Dec. 20, 1955. The assembly's 11th session opened on Nov. 12, 1956. Important issues on the assembly's provisional agenda included the Hungarian and Egyptian situations, the question of disarmament, the problem of race relations in the Union of South Africa and the question of self-determination in Cyprus. Among new questions inscribed on the provisional agenda were the following: an Indian request for consideration of "peaceful utilization of Antarctica"; a request by the government of Greece for discussion of interim measures on human rights, pending the entry into force of the United Nations covenants; and proposals by a number of Latin-American nations and Spain for increasing the membership of the Security council, the Economic and Social council, the International Court of Justice and the International Law commission.

Until the end of Dec. 1955 the membership of the Security council consisted of five permanent members (China, France, the U.S.S.R., the United Kingdom and the United States) and six nonpermanent members (Belgium, Brazil, Iran, Peru, Turkey and New Zealand). At its tenth session, the general assembly elected Cuba, Australia and Yugoslavia to take the places of Brazil, New Zealand and Turkey on the council for two-year terms beginning Jan. 1, 1956. Yugoslavia was named after a long period of deadlock in which the U.S.S.R. sponsored the membership of Poland and the U.S. backed the election of the Philippines. At the initiative of the president of the assembly, a compromise was arranged and Yugoslavia was elected to replace Turkey. Under a "gentleman's agreement" Yugoslavia was to resign its seat after one year and the assembly would then elect the Philippines for the remainder of the term.

The concluding portion of the Economic and Social council's 20th session took place at UN headquarters from Dec. 5 to Dec. 15, 1955. Meetings of the council's 21st session were held between April 17 and May 4, 1956. The council met for its 22nd session—July 9–Aug. 10—in Geneva, Switz. Brazil, Canada, Greece and Indonesia were elected by the tenth general assembly for three-year terms to replace Australia, India, Turkey and Venezuela. The United States and Yugoslavia were re-elected for another term. Other members of ECOSOC during 1956 were as follows: with terms ending Dec. 31, 1956—Czechoslovakia, Ecuador, Norway, Pakistan, the U.S.S.R. and the United Kingdom; with terms ending Dec. 31, 1957—Argentina, China, Dominican Republic, Egypt, France and the Netherlands.

At its 17th session from Feb. 7 to March 23, 1956, the Trusteeship council considered the annual reports of the administering authorities, the reports of visiting missions and the question of administrative unions affecting Tanganyika, Ruanda-

Urundi, the Cameroons and the Togolands. Progress toward self-government in the Pacific trust territories occupied central attention at the 18th meeting of the council, June 7 to Aug. 3. Membership in the council during 1956 was as follows: members administering trust territories—Australia, Belgium, France, New Zealand, the United Kingdom and the United States; members by virtue of permanent membership in the Security Council—China and the U.S.S.R.; members elected by the general assembly—India and Haiti until Dec. 31, 1959, and Guatemala and Syria until Dec. 31, 1958. Since Italy administers the trust territory of Somaliland, the admission of Italy to the UN on Dec. 14, 1955, entailed automatic membership in the Trusteeship council. This in turn necessitated the addition of a nonadministering country, and Burma was elected to serve.

Cases pending before the International Court of Justice during 1956 were the case of the Norwegian loans issued in France (*France v. Norway*) and right of passage through Indian territory (*Portugal v. India*). On June 1, 1956, the court delivered its advisory opinion on the admissibility of hearing of petitioners by the Committee on South-West Africa. The court held that it would not be inconsistent with its judgment of July 1950 for the assembly to authorize a procedure for granting these hearings providing that the assembly was convinced of the necessity of such a course for the maintenance of effective international supervision of the territory. An advisory opinion on judgments of the administrative tribunal of the International Labour organization upon complaints made against UNESCO was delivered by the court on Oct. 23, 1956. The court was of the opinion that the administrative tribunal was competent, under article ii of its statute, to hear the complaints introduced against UNESCO by Duberny, Leff, Wilcox and Bernstein. Furthermore, the court held that the validity of the decisions given by the administrative tribunal in the four cases in question was no longer open to challenge. By order of March 16, 1956, the court removed the two Antarctica cases (*U.K. v. Chile* and *U.K. v. Argentina*) from its list. The Aerial Incident of Oct. 7, 1952 (*U.S. v. U.S.S.R.*), and the Aerial Incident of March 10, 1953 (*U.S. v. Czechoslovakia*), were removed from the court's list on March 14, 1956. On June 28 a vacancy was created in the court by the death of Judge Hsu Mo of China who was to hold office until Feb. 5, 1958. Under the court's statute, the chair would be filled after an absolute majority vote of the general assembly and the Security council.

Administration and Finance.—At its ninth session the general assembly voted appropriations for 1955 of \$46,963,800. This amount was increased to \$50,228,000 when the tenth assembly on Dec. 16, 1955, appropriated an additional \$3,264,200 as a supplement to the 1955 budget. At the same time, a budget of \$48,566,350 for the expenses of the organization during 1956 was approved. The secretary-general estimated that a sum of \$48,250,700 would be necessary to cover UN operating expenses during 1957.

Assessments for 1956 were made on the basis of the scale of assessment adopted by the general assembly for the years 1956, 1957 and 1958 in its resolution of Dec. 15, 1955. This resolution grants the secretary-general authority to accept a portion of the contributions of member states for the financial year 1956 in currencies other than U.S. dollars. Members were advised that 17.65% of their 1956 contributions could be paid in Swiss francs, 10.50% in pounds sterling and 6.30% in a group of other non-U.S. dollar currencies. Twenty-two states decided to avail themselves of the option to pay in one or more of these currencies. The assessment of the 16 new members of the UN was deferred until the 11th session of the general assembly.

Political and Security Questions.—*Disarmament.*—Generally viewed as the leading issue before the assembly, the disarmament question received lengthy consideration at the 10th

session. In a resolution which many delegates estimated the most significant yet approved on the subject, the general assembly on Dec. 15, 1955, called upon the members of the United Nations, particularly those on the Disarmament commission's subcommittee (Canada, France, U.S.S.R., United Kingdom, United States), to continue their attempts to reach agreement on a comprehensive disarmament plan. In particular, the goals unanimously adopted by the assembly in 1954 were recalled, and it was suggested that priority be given to early agreement on and implementation of Pres. Dwight D. Eisenhower's "open sky" plan and Prime Minister Nikolai Bulganin's proposal for ground control posts.

The assembly's resolution of Nov. 4, 1954, had urged agreement on a collective system of disarmament to be embodied in a draft international disarmament convention. The convention was to provide for: (1) the regulation, limitation and major reduction of all armed forces and all conventional armaments; (2) the total prohibition of use and manufacture of nuclear weapons of mass destruction together with conversion of existing stocks of nuclear weapons for peaceful purposes; (3) the establishment of effective international controls through a responsible and efficient control organ.

On July 21, 1955, Pres. Dwight D. Eisenhower had suggested that the U.S. and the Soviet Union exchange complete blueprints of their military establishments and permit aerial photography within their territories. The U.S.S.R., however, rejected the Eisenhower plan and endorsed the establishment of control posts at strategic points on the territory of all states in order to prevent any dangerous concentration of forces or any surprise attack.

In the course of its meetings, between March 19 and May 4, 1956, the Disarmament subcommittee (Canada, France, U.S.S.R., United Kingdom, United States) received a four-power western proposal which listed certain prerequisites to disarmament and a formal statement from the U.S.S.R. which represented a new approach to the solution of the disarmament problem. The western powers insisted that disarmament proceed by stages with progress from one stage to another dependent on the development of confidence through the settlement of major political problems; that the program must operate under effective international control with inspection rights including aerial reconnaissance; that, under proper safeguards, the program must provide for stopping the build-up of nuclear stockpiles and devoting all future production of nuclear material to peaceful purposes; that preliminary inspection methods be demonstrated on a limited scale; and that provision be made for the suspension of the program if a major state failed to carry out its obligations.

The U.S.S.R. statement upheld the Soviet proposals of May 10, 1955, calling for implementation of a disarmament convention by stages. But, since it had not been possible to agree on nuclear disarmament, in order to attempt to reach some realizable agreement, the Soviet Union urged the reduction of conventional arms and the establishment of suitable controls, such reduction not to be made conditional on the prohibition of atomic weapons.

Further negotiations in the subcommittee and later in the Disarmament commission's meetings from July 3 to July 16 indicated that differences between the great powers had been somewhat narrowed. Thus, for example, the Soviet Union consented to an international inspection and control system which would be effective before any disarmament began. Furthermore, it agreed with the western powers on a reduction of forces to 2,500,000 men each for the U.S., the U.S.S.R. and China and 750,000 men for France and the United Kingdom. On the other hand, minor disarmament cuts in conventional forces before the solution of such political questions as the unification of Germany and of Korea were agreed to by the western powers. The United States

also offered to begin control of nuclear as well as conventional arms in the first phase of a disarmament program.

Basic disagreements nevertheless prevented the drafting of an international treaty on disarmament. The western powers continued to insist upon stringent controls, including aerial surveys, before starting any arms reductions, while the Soviet Union maintained its demand for ground controls only. On the question of staging, the U.S. favoured a preliminary phase in which conventional arms would be cut under stringent controls and in which some control over nuclear weapons would be initiated. A pause would follow to determine whether international conditions permitted further nuclear disarmament. But the U.S.S.R., while desirous of complete prohibition and elimination of nuclear weapons as proposed in its plan of May 10, 1955, submitted a proposal for purely conventional disarmament which would ease agreement on nuclear disarmament. Furthermore, the U.S. was reluctant to begin any disarmament without assurances of Soviet co-operation in the settlement of major political issues. The U.S.S.R. failed to see the necessity of awaiting the solution of other political problems before agreement on disarmament. In view of these continuing differences between the two sides, the Disarmament commission on July 16 requested its subcommittee to continue its efforts to reach agreement.

Peaceful Use of Atomic Energy.—A proposal for an International Atomic Energy agency, under the aegis of the UN, was first proposed by President Eisenhower in Dec. 1953. Subsequently, a 12-nation working group prepared a draft statute for the agency and invited more than 80 states to attend an atomic energy conference to discuss and adopt the text. The conference opened at UN headquarters on Sept. 20, 1956, and adjourned on Oct. 27.

In order to attain its primary objective of accelerating and enlarging the contribution of atomic energy to the peace, health and prosperity of the world, the new agency was to (1) encourage and assist research on, and development and practical application of, atomic energy for peaceful uses; (2) make provision for materials, services, equipment and facilities; (3) foster the exchange of scientific and technical information; (4) encourage the exchange of scientists and experts in the field; (5) establish and administer safeguards to ensure that all aspects of the agency's work would not further any military purpose; (6) adopt standards of health and caution to provide for safe operation of the agency's tests.

A board of governors of 21 to 25 nations would manage the agency's daily affairs, reporting regularly to an advisory council of all member nations. The agency, operating like a bank, would receive deposits of fissionable materials and nuclear equipment. Those members lacking these atomic materials would draw on the deposits for approved atomic energy projects. In a crucial article dealing with agency safeguards, the statute gave the agency power to send inspectors to recipient states to observe operation of reactors and ensure that programs were kept strictly nonmilitary in nature.

On Oct. 26, 1956, 70 states signed the statute of the agency. President Eisenhower pledged the United States as the first depositor of the bank with an initial contribution of 11,000 lb. of U^{235} , plus as much as all other nations would contribute until 1960. The task of organizing the agency was passed to a preparatory commission of 18 nations which would name a secretary-general. The unit would report to the general assembly and to the Security council.

Effects of Atomic Radiation.—Acting upon requests by India and the United States that the United Nations consider this matter, the general assembly by unanimous vote on Dec. 3 established a 15-member scientific committee to collect, evaluate and disseminate information on the effects of atomic radiation on man



CORRIDOR CONFERENCE of Egyptian officials at the United Nations headquarters, New York city, between meetings of the Security council on the issue of Suez in Oct. 1956. From left to right: Omar Loutfi, permanent representative to the United Nations; centre, Mahmoud Fawzi, foreign minister; right, Mohamed Riad, Egyptian first secretary at the United Nations

and his environment. Argentina, Australia, Belgium, Brazil, Canada, Czechoslovakia, Egypt, France, India, Japan, Mexico, Sweden, the U.S.S.R., the United Kingdom and the United States were designated as members of the committee.

The assembly specified that the main task of the committee was to recommend and assemble reports on observed levels of ionizing radiation and radioactivity in the environment. Reports on experiments and observations under way were also to be studied. In addition, the committee was to recommend uniform standards for sample collection and radiation-counting procedures. Evaluation and documentation of this data would be transmitted to the secretary-general for publication and dissemination.

The first session of the Scientific Committee on the Effects of Atomic Radiation was held at UN headquarters from March 14 to 23. C. E. Eddy of Australia was elected chairman. The committee discussed the scope and organization of its work and received reports on genetics, the effects of irradiation by internally absorbed isotopes and the effects of external radiation, natural radiation background, exposures during medical procedures and occupational exposure and environmental contamination.

Questions Involving National Independence and Self-Determination.—**Algeria.**—The situation in Algeria continued to occupy the attention of a number of African and Asian states. In June 1956, 13 of these nations requested the Security council to consider the matter under article 35, paragraph 1 of the charter. They stated that council action was essential in view of the nature and scope of recent French military actions in the area and the failure of the French government to negotiate with Algerian representatives. A majority of council members, however, expressed doubt that the UN could assist in the solution of the problem at that time. These states questioned the legal competence of the Security council to consider the question, in

view of article 2, paragraph 7 of the charter. It was therefore decided on June 26 not to place the item on the council's agenda.

Cyprus.—The general assembly decided in Sept. 1955 not to consider the dispute between Greece and the United Kingdom over self-determination in Cyprus. Subsequently, however, negotiations between the British governor of Cyprus and Archbishop Makarios broke down, and the representative of Greece, in a letter dated March 13, 1956, requested that the problem be inscribed in the provisional agenda of the 11th session.

Other incidents in Cyprus, following Egypt's nationalization of the Suez canal, were cause of concern to several Arab states during the summer of 1956. In communications to the president of the Security council on Sept. 17 the representatives of Lebanon and Syria protested the assembling of French forces on the island and requested their immediate withdrawal.

Suez.—The incident engendered by Egypt's nationalization of the Suez canal on July 26, 1956, came before the Security council after two months of lengthy discussion and negotiation between the parties concerned. The United Kingdom and France, fearful of their interests in the middle east and dependent on the canal for transport of middle eastern oil, were insistent upon international operation of the canal to assure free passage through the waterway for all ships at all times. As an ally and canal user, the United States shared the Anglo-French interest in international control of the canal but, unlike the other two states, was unwilling to utilize forceful means to achieve this purpose.

At two London conferences, proposals providing for an International Suez Canal board to operate and develop the canal and for an association of canal users to take ships of member countries through the canal were adopted by the majority of nations at these meetings. Egypt rejected both propositions.

On Sept. 23-24 Britain and France, followed by Egypt, carried the Suez canal dispute to the Security council. In the debate that ensued, the foreign ministers of France, Britain, the United States, the U.S.S.R. and Egypt were, however, unable to reach agreement. On Oct. 9 direct high-level negotiations between Egypt, Britain and France began in the secretary-general's office. The atmosphere was one of conciliation and deep secrecy.

The council met in closed session on Oct. 12 to hear the results of the talks from the secretary-general, who revealed that all parties were agreed upon six principles regarding the canal: (1) guarantee of free and open transit through the canal without discrimination; (2) respect for Egypt's sovereignty; (3) insulation of canal operation from the politics of any country; (4) agreement between Egypt and the users as to the manner of fixing tolls; (5) allotment of a fair proportion of the dues to canal development; (6) settlement by arbitration of unresolved affairs between the dispossessed Suez Canal company and the Egyptian government. In further debate on the question, Britain and France remained concerned about implementation of the agreed principles. On Nov. 13 they submitted a resolution which endorsed the proposals of the first London conference. It invited Egypt to submit a counterproposal "not less effective" than the London recommendations. When the Soviet Union vetoed the resolution during the roll call, the council adjourned without setting a new meeting date.

However, on Oct. 29 the situation in regard to Suez changed considerably and assumed still graver and more serious dimensions. When on that day Israeli forces invaded the Sinai peninsula of Egypt and reached within 20 mi. of the Suez canal, Britain and France immediately issued an ultimatum calling upon Israel and Egypt to stop all hostilities and to withdraw their military forces to a distance of 10 mi. from the canal. Egypt rejected the ultimatum whereupon the British and French governments made known their decision to send troops to Egypt for the purpose of protecting their interests in the region and restoring order

in the middle east.

During an emergency meeting of the Security council on Oct. 30, the United States introduced a resolution which not only called upon Israel to withdraw its forces behind the established armistice lines, but also requested all states to refrain from the use of force or threat of force in the area and to assist the UN in assuring the integrity of the armistice agreements. Defending their decision to rush troops to the Suez canal on the ground that the Security council could not act quickly enough, the United Kingdom and France vetoed the U.S. resolution. The next day British bombers began an attack on military targets in Egypt. The raids were carried out to force compliance with the British and French ultimatum to Egypt to withdraw Egyptian forces from the Suez canal area.

On Oct. 31 the Security council called an emergency session of the general assembly to make recommendations on the "actions undertaken against Egypt." A U.S. proposal calling for a cease fire in the Egyptian fighting was approved by a vote of 64 to 5. Britain, France, Israel, Australia and New Zealand rejected the resolution. However, four days later, the United Kingdom and France announced that they were ready to stop military operations on three conditions: (1) that Israel and Egypt accept a UN force to preserve peace between them; (2) that the UN create such a force and maintain it until Israel and the Arab states agreed on a peaceful settlement and until satisfactory arrangements were made in respect to the canal; (3) that, pending creation of a UN force, Israel and Egypt agree to Anglo-French occupation, in the name of the UN, of a zone between the Israeli and Egyptian forces.

The assembly acted with decision and determination on Nov. 5. In a vote of 57 to 0 with 18 abstentions, it created an international UN command force, with the duty of supervising the cessation of fighting in the middle east. Maj. Gen. E. L. M. Burns of Canada was named chief of staff of the new unit. On the same day, British and French forces invaded Egypt by air. On Nov. 7, however, the two western allies ceased fire in Egypt and halted their advance against Egyptian forces in the Suez canal zone. Egypt and Israel also assured the UN of their willingness to observe the cease fire. Fighting in Egypt therefore came to a halt, with the United Nations international police force prepared to begin operations, and the UN anxious to promote a permanent settlement of outstanding issues in the middle east.

Palestine.—From Dec. 16, 1955, through Jan. 19, 1956, the council discussed an incident which had taken place on the eastern shore of Lake Tiberias on the night of Dec. 11-12. Syria accused Israel's armed forces of launching a concentrated large-scale attack in this area in violation of the Syrian-Israel general armistice agreement of July 20, 1949, and of committing an act of open aggression and provocation contrary to the provisions of the United Nations charter. Syria, therefore, called upon the Security council to adopt economic sanctions against Israel and to recommend the expulsion of Israel from the United Nations.

The representative of Israel alleged that the clash in question was the index and result of tensions which had long prevailed between Syria and Israel; that Syrian artillery posts on the borders of Lake Tiberias had constantly harassed Israel's fishing and police boats; that evidence discovered on Syrian prisoners showed that Syrian outposts off the northeastern shore of Lake Tiberias had been instructed to fire upon Israeli boats approaching within 250-400 m. of the shore; that Lake Tiberias was entirely within Israeli territory.

Gen. E. L. M. Burns, chief of staff of the UN Truce Supervision organization in Palestine, in a report to the council, stated that although Syrian interference with Israel's activity on the lake had taken place, the disparity between the retaliation and the provocation was immense.

The Security council in a resolution of Jan. 19 noted interference by Syrian authorities in Israeli activities on Lake Tiberias in contravention of the general armistice agreement between Israel and Syria, but held that this interference in no way justified the Israeli action. It termed the attack a flagrant violation of the cease-fire provisions of the council's resolution of July 15, 1948, of the terms of the armistice agreement and of Israel's obligations under the charter. Israel was called upon to comply with its obligations in the future, in default of which the council would have to consider what further measures were required by the charter.

Further incidents of violence and hostility on either side of the armistice demarcation lines, coupled with the persistent build-up of armed forces, led the United States on March 20, 1956, to request a meeting of the Security council for renewed consideration of the Palestine question. A resolution drafted by the United States was unanimously adopted by the council on April 14. By the terms of this resolution, Sec.-Gen. Dag Hammarskjöld was requested to undertake a survey of various aspects of enforcement of and compliance with the armistice agreements between Israel and its four Arab neighbours. Hammarskjöld's immediate task was to arrange and negotiate with Israel, Jordan, Syria, Lebanon and Egypt for the adoption of any measures which would lessen tensions along the demarcation lines.

After a month of discussions with the leaders of the parties concerned, the secretary-general, on May 9 gave a full account of the outcome of his mission. He asserted that unconditional cease-fire agreements between Israel and the four Arab states had been re-established and that a general will to peace was prevalent in the middle east.

Nevertheless serious incidents along the cease-fire line continued to occur throughout the month of September. A series of Arab forays into Israeli territory, succeeded by large-scale reprisal attacks, began to follow a persistent pattern. But on Oct. 29 Israeli armour and paratroops were thrust deep into Egypt's Sinai peninsula in a move that constituted much wider proportions than a reprisal raid. One day later, Israel agreed to accept the Anglo-French ultimatum to withdraw its troops from the canal area and permit British and French occupation of key canal points. The proposal was, however, unconditionally rejected by the Egyptians. The United Kingdom and France then vetoed the resolution in the Security council calling upon Israel immediately to withdraw its armed forces behind the armistice lines. Israel, Britain, France, Australia and New Zealand likewise rejected the assembly's resolution of Nov. 1 calling for a cease fire in the middle east and withdrawal of Israeli forces from Egyptian territory.

Meanwhile, Anglo-French landing forces moved toward Suez and the entire Gaza strip fell into the hands of Israeli forces. By Nov. 2 Israel commanded the entire Sinai peninsula to within 13 mi. of the canal. Nevertheless, on Nov. 4, the representative of Israel made known that his government would accept a UN cease fire provided that the Egyptians did likewise and provided that Israel's borders were firmly guaranteed against violation.

On Nov. 4 the assembly accepted a proposal for the creation of a UN police force to obtain and supervise a cease fire in the Suez canal area. Shortly thereafter, Egypt and Israel made known their intention to observe the cease fire and the United States submitted a plan to the assembly calling for establishment of a new committee of five nations which would seek an end to recurrent Arab-Israeli border clashes by obtaining a permanent peace settlement.

Question of Hungary.—The news of Poland's demonstration of defiance against Soviet domination during the week of Oct. 20–27 touched off a similar rebellion in Hungary. In a demand for the restoration to the premiership of Imre Nagy, a dedicated

Hungarian nationalist, and the withdrawal of Erno Gero, Soviet puppet ruler, thousands of persons rioted in the streets of Budapest on October 23. Although the Communist party's central committee proceeded to install Nagy as premier, Gero was retained as party chief and the Hungarians remained rebellious. On Oct. 24 about 10,000 Soviet troops, equipped with tanks, artillery and armoured cars, marched into Budapest "to liquidate the rebels." The major revolt was soon quelled, but several hundred students and workers, staging a peaceful demonstration in Budapest to demand Gero's dismissal, were massacred by Soviet tank crews. This incident precipitated war throughout the Hungarian countryside.

On Oct. 27 the United States, Britain and France requested the Security council to consider the Hungarian situation. By a vote of 9 to 1, with Yugoslavia abstaining, the question was placed on the council's agenda on Oct. 28. The vote came after most of the council members had strongly denounced the use of Soviet troops in an attempt to put down the rebellion against the Hungarian communist government. The Soviet Union contended that the uprising was of domestic concern only and that therefore a western resolution on the matter would be vetoed.

Soviet troops nevertheless remained in control of Budapest and Hungarian rebels refused to lay down their arms until all Soviet forces had evacuated the city. On Nov. 2 Premier Nagy cabled the secretary-general of the UN, asking that Hungary's case be presented before the "forthcoming general assembly." Nagy also asked Hammarskjöld to "call upon the great powers to recognize the neutrality of Hungary and ask the Security council to instruct the Soviet and Hungarian governments to start negotiations immediately."

The general assembly voted on Nov. 4 for a UN investigation in Hungary by representatives of the secretary-general. In a resolution introduced by the United States and approved by 50 nations, the assembly deplored the use of force by the Soviet Union to crush the Hungarian revolt and asked the Soviet government to withdraw its forces without delay.

Racial Policies of the Union of South Africa.—The question of the treatment of persons of Indian origin in the Union of South Africa had been before the general assembly since 1946. Little progress toward agreement between the governments of India, Pakistan and the Union of South Africa had been achieved, however, despite persistent council resolution on the matter. The Union government consistently maintained that the South African question was one of domestic jurisdiction and therefore outside the competence of the United Nations.

When on Nov. 9, 1955, the assembly's political committee adopted a resolution expressing concern at the Union of South Africa's policies of apartheid and calling upon the UN Commission on the Racial Situation in the Union to keep the matter under review, the Union government withdrew its delegation from the assembly. On Dec. 14 the assembly urged the parties to pursue negotiations with a view to attaining a settlement of the question. But in Sept. 1956 India and Pakistan, voicing regret that the South African government had not heeded the assembly's appeal, requested the general assembly to give renewed consideration to the problem at its 11th session.

Economic and Social Co-operation.—*Economic Development.*—In accordance with a recommendation of the eighth assembly, the United Nations and the International Bank for Reconstruction and Development elaborated machinery for channelling private capital into productive investments in underdeveloped countries. In April 1955 the bank submitted to its members the charter of the International Finance corporation to come into operation as soon as it had been ratified by 30 states and 75% of \$100,000,000 capital had been subscribed. The charter went into effect on July 20, 1956, with a membership of

31 countries and capital subscriptions of \$78,366,000. Closely affiliated with the International bank, the International Finance corporation was to make direct loans to private enterprise without government guarantees and would be allowed to make loans for other than fixed returns.

Technical Assistance.—At the sixth United Nations Technical Assistance conference on Oct. 26, 1955, 61 states pledged amounts equivalent to \$28,031,536 for the 1956 program. This sum was made possible because 23 countries increased their pledged amounts over the 1955 contributions and because two countries, Spain and Rumania, pledged for the first time. The U.S. promised to contribute \$15,500,000 for 1956, providing that the pledges of all other participating countries were equivalent to that amount.

Refugees.—Under the mandate of the UN high commissioner for refugees, the UN continued to have responsibilities for about 350,000 unassimilated refugees outside of Korea and Palestine. A program designed to achieve a permanent solution to the problem by the end of 1958 was approved by the ninth general assembly and was initiated in June 1955. The new program sought integration of refugees into permanent occupations and their resettlement. In 1955 governmental contributions to the UN Refugee fund were received in the amount of \$2,653,697 while about \$955,000 was contributed from nongovernmental sources.

Trusteeship and Nonsself-governing Territories.—*Trusteeship System.*—The promotion of political, economic, social and educational advancement of the inhabitants of the trust territories, and their progressive development toward self-government or independence, again provided the principal matters of interest in the operation of the international trusteeship system during 1956. The scope of the system remained limited to 11 territories—3 in east Africa (Ruanda-Urundi, Tanganyika and Somaliland), 4 in west Africa (British Cameroons and French Cameroun and British and French Togoland) and 4 in the Pacific (Pacific Islands, Western Samoa, New Guinea and Nauru). These territories contain more than 20,000,000 people.

At the meetings of the Trusteeship council in 1956, attention was particularly brought to bear on an event unprecedented in the history of the trusteeship system—the plebiscite held in British Togoland to ascertain the wishes of the population as to their political future. The question of British Togoland's future status was raised by the United Kingdom in 1954 when it asked the UN to consider what alternative arrangement should be made for the territory when the Gold Coast attained independence in 1957. For more than 35 years the trust territory had been administered by the U.K. as an integral part of the adjacent Gold Coast, a British nonsself-governing territory. Upon the recommendation of the visiting mission to British Togoland in 1955, the general assembly at its tenth session asked Britain to organize and conduct a plebiscite in the area, under the supervision of the UN, in order to determine the political wishes of the inhabitants. On May 9, 1956, the Togolandese went to the polls to decide whether they wished union of the territory with an independent Gold Coast or separation of the territory from the Gold Coast and its continuance under trusteeship pending the ultimate determination of its future. In a decision which it was believed would probably change the map of west Africa, 93,365 voters favoured integration with the Gold Coast, while 67,422 balloted in favour of continuing the existing trusteeship arrangements. Support of this decision was evinced at the Trusteeship council's 18th session. Termination of the trust agreement for British Togoland, however, required the final approval of the general assembly.

At its tenth session the assembly also discussed the future of Togoland under French administration and endorsed the conclusion of a visiting mission that the implementation of contem-

plated reforms by France would be helpful in enabling the political wishes of the inhabitants to be ascertained. It requested the Trusteeship council to undertake a special study of the matter and to report thereon at the assembly's 11th session.

Nonsself-governing Territories.—Under article 73e of the charter, the secretary-general in 1955 received information from seven administering members on 58 territories, as compared with 59 in 1954. The reduction was a consequence of the cessation of information by Denmark in respect of Greenland. The attainment of autonomy by two former nonsself-governing territories in the western hemisphere—Surinam and the Netherlands Antilles—was recognized by the general assembly on Dec. 15, 1955.

On Nov. 8, 1955, the assembly called for a ten-year retrospective report on the progress achieved in the nonsself-governing territories to be prepared for review in 1959. Such a survey was intended to disclose to what extent the world's 50,000,000 dependent peoples were now advancing toward the goals set in chapter xi of the charter.

Specialized Agencies.—In addition to the work of the UN itself in the social and economic fields, a great deal of important work is done by the specialized agencies, international organizations operating under their own constitutions for special purposes and brought into relationship with the UN by agreement. During 1956 the following agencies were in actual operation.

Food and Agriculture Organization (FAO).—Headquarters in Rome, It.; Binay R. Sen, director-general; 72 members.

International Labour Organization (ILO).—Headquarters in Geneva, Switz.; David A. Morse, director-general; 76 members. (See separate article.)

International Bank for Reconstruction and Development.—Headquarters in Washington, D.C.; Eugene R. Black, president; 59 members. (See separate article.)

International Monetary Fund.—Headquarters in Washington, D.C.; Per Jacobsson, managing director; 59 members. (See separate article.)

International Civil Aviation Organization (ICAO).—Headquarters in Montreal, Que.; Carl Ljungberg, secretary-general; 69 members. (See AVIATION, CIVIL.)

International Telecommunication Union (ITU).—Headquarters in Geneva, Switz.; Marco Andrada, secretary-general; 91 members.

United Nations Educational, Scientific and Cultural Organization (UNESCO).—Headquarters in Paris, Fr.; Luther H. Evans, director-general; 76 members plus 4 associate members.

Universal Postal Union (UPU).—Headquarters in Berne, Switz.; Fritz Hess, director of the international bureau; 96 members.

World Health Organization (WHO).—Headquarters in Geneva, Switz.; Marcolino C. Candau, director-general; 84 members plus 4 associate members. (See separate article.)

World Meteorological Organization (WMO).—Headquarters in Geneva, Switz.; D. A. Danes, secretary-general; 94 members. (See METEOROLOGY.)

(See also ATOMIC ENERGY; CHINA; EDUCATION; INTERNATIONAL LAW; MIDDLE EASTERN AFFAIRS; NARCOTICS; REFUGEES; SUEZ CANAL CONFLICT; TRUST TERRITORIES.) (L. M. GH.)

United States. This federal republic in North America, bounded north by Canada, south by Mexico, east by the Atlantic ocean and west by the Pacific ocean, has an area of 3,022,387 sq.mi., including 47,662 sq.mi. of inland water. Its population was 150,697,361 by the 1950 census and 167,191,000 by the July 1, 1956, estimate. Territories and possessions are shown in Table I and chief cities in Table II:

(See also BIRTH STATISTICS; CENSUS DATA, U.S.; CHURCH MEMBERSHIP; DEATH STATISTICS; INDIANS, AMERICAN; NE-

Table I.—Territories and Possessions of the United States

Territory or Possession	Area (sq.mi.)	Population, 1955 est.	Territory or Possession	Area (sq.mi.)	Population, 1955 est.
Alaska	586,400	213,000	Hawaii	6,423	523,359*
Bonin Islands	40	177*	Panama Canal Zone	553	55,000
Marshall, Caroline and Mariana Islands	687	65,039*	Puerto Rico	3,435	2,276,000
Samoa	76	22,500*	Ryukyu Is.	848	798,000
Guam	206	36,000†	Virgin Islands	133	25,000

*1956 est. †Excludes military personnel.

In addition to these possessions there are ten islands in the Pacific ocean which have a total land area of approximately 20 sq.mi.: Baker, Howland, Jarvis, Johnston and Sand (pop., 1950 census, 46), Kingman Reef, Midway (pop. 416), Palmyra, and Wake (pop. 349). There are also two condominiums administered by the U.S. and the U.K.: Canton Island (pop. 272) and Enderbury Island.

Table II.—Chief Cities of the United States

City	Population, 1950 census	City	Population
Washington, D.C., cap.	802,178	Houston, Tex.	596,163
New York, N.Y.	7,891,957	Buffalo, N.Y.	580,132
Chicago, Ill.	3,620,962	New Orleans, La.	570,445
Philadelphia, Pa.	2,071,605	Minneapolis, Minn.	521,718
Los Angeles, Calif.	1,970,358	Cincinnati, O.	503,998
Detroit, Mich.	1,849,568	Seattle, Wash.	467,591
Baltimore, Md.	949,708	Kansas City, Mo.	456,622
Cleveland, O.	914,808	Newark, N.J.	438,776
St. Louis, Mo.	856,796	Dallas, Tex.	434,462
Boston, Mass.	801,444	Indianapolis, Ind.	427,173
San Francisco, Calif.	775,357	Denver, Colo.	415,786
Pittsburgh, Pa.	676,806	San Antonio, Tex.	408,442
Milwaukee, Wis.	637,392	Memphis, Tenn.	396,000

GROES [AMERICAN]; also articles on the separate states, territories and possessions.)

President in 1956: Dwight D. Eisenhower (*q.v.*), whose cabinet was composed as follows:

Post	Name	State
Secretary of state	John Foster Dulles	New York
Secretary of the treasury	George M. Humphrey	Ohio
Attorney general	Herbert Brownell, Jr.	New York
Postmaster general	Arthur E. Summerfield	Michigan
Secretary of the interior	Frederick A. Seaton	Nebraska
Secretary of agriculture	Ezra Taft Benson	Utah
Secretary of commerce	Sinclair Weeks	Massachusetts
Secretary of labour	James P. Mitchell	New Jersey
Secretary of defense	Charles Erwin Wilson	Michigan
Secretary of health, education and welfare	Marion B. Folsom	New York

History.—*The State of the Union.*—At all levels of government, 1956 was an election year. That the rest of the world would show an interest in the U.S. election proceedings was inevitable, for at midyear it was reported that, with 6% of the world's people, the United States was producing about 40% of the world's goods and services, or almost twice that of the United Kingdom, France, west Germany and Italy combined. Purchasing 15% of the world's imports, the nation accounted for 20% of its exports. There was no question that 1956 was a time when more citizens in all 48 states enjoyed more prosperity than ever before. Neither the national elections nor events abroad seemed to disturb the economy in any important respect.

In his state of the union message in January, Pres. Dwight D. Eisenhower listed five objectives of the nation. These were: to discharge its world responsibility, improve its national security, maintain its fiscal integrity, foster an ever-expanding economy and respond to its own human needs. There would continue to be reliance on collective security, even though armament reduction "under effective inspection and control" was a national objective. The struggles of the nations of Asia to maintain their freedom would be aided. The European alliance would be increased in strength, he anticipated, and a fair solution of problems in the middle east attained. The administration sought highway and flood disaster legislation, higher postal rates, a five-year program of federal aid to increase school construction, expansion of social security, some amendment of the Taft-Hartley labour law, some public housing for slum areas, statehood for Hawaii and progress toward that status for Alaska, and amendment of immigration laws. The reaction to the message was divided on party lines.

Congress.—Among the major laws passed by congress were 16 intended to improve governmental organization, 16 designed

to strengthen the defense and security of the nation, 9 treating international affairs, 19 relating to the economy, 11 affecting veterans and servicemen, 15 on agricultural matters (in addition to a farm price support bill vetoed by the president), 19 on natural resources (3 of which were vetoed) and 24 relating to social security, health and welfare.

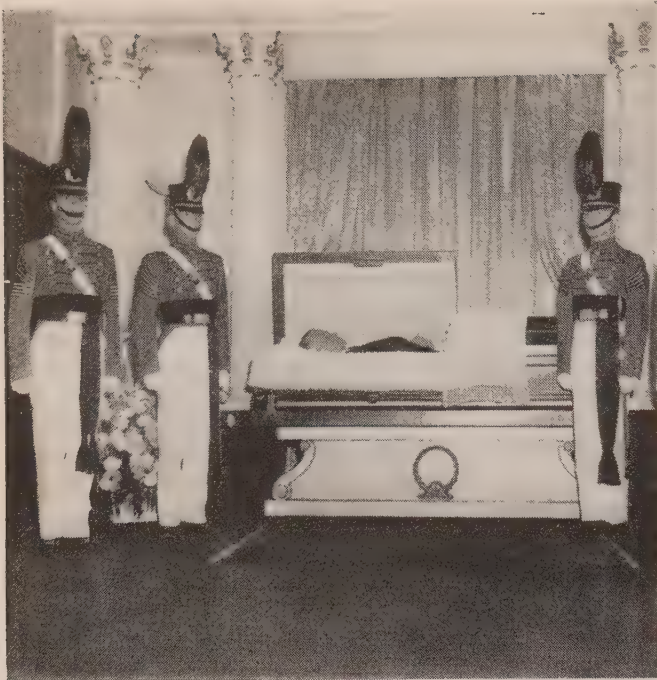
Congress authorized many expenditures for national defense, including \$1,400,000,000 for new naval construction and modification of existing vessels and \$295,000,000 for capital expenditures by the Atomic Energy commission. Expenditure of \$33,500,000,000 for a 13-year program of highway construction was authorized, together with increased excise taxes to finance perhaps \$14,800,000,000 in 16 years. A 41,000-mi. interstate highway system as a result would be 90% federally financed. "In God We Trust" was made the official national motto. The federal debt limit was raised from \$275,000,000,000 to \$278,000,000,000. An atomic-powered merchant ship was to be built. Several bills providing for greatly liberalized pensions for veterans failed of passage by the senate, but all military personnel were put under social security and a new government-financed private hospitalization program for their dependents was inaugurated.

Social Welfare.—Congress amended the 21-year-old Social Security act in August, increasing public assistance payments (\$4 per aged recipient), broadening the coverage of old-age and survivors' insurance (leaving physicians the only major group not covered), lowering the benefit eligibility age for certain women to 62, and creating a new program of disability insurance with its own trust fund. The O.A.S.I. program had 32,000,000 permanently insured workers in 1956 (1950: 14,900,000). Beneficiaries numbered 8,400,000, an increase of nearly 2,000,000 in two years. Public assistance, meanwhile, had almost stabilized; the number of old-age assistance recipients, 2,580,000 in June 1954, was 2,520,000 two years later. Expenditures by the larger social welfare programs financed by government, federal, state and county, in the nation in 1954-55 were, in order, social insurance programs \$12,600,000,000, public assistance \$2,900,000,000, health and medical services \$4,000,000,000 and other programs \$1,100,000,000. (See also SOCIAL SECURITY.)

Foreign Affairs.—Reporting to congress on the Mutual Security program, the president stated that it had "further advanced the security, the economic progress, and the well-being of the United States and our partners in the free world." Since 1950 U.S. military aid in equipment and supplies had come to \$14,200,000,000. (See also FOREIGN AID PROGRAMS, U.S.)

The ebb and flow of events in 1956 left relations between the United States and the U.S.S.R. fundamentally little changed. While Soviet emphasis on economic and trade rivalry had attracted official notice late in 1955, events a year later showed that there had been a change in tactics but not in strategy. The sharp contrast between the basic approaches of the United States and the Soviet Union toward small powers had been made clear by events in Hungary and the middle east.

The position of the government toward the United Nations continued to be one of maximum participation in debate, in activities and in financing. By 1956 the balance on the initial U.S. loan to the UN stood at \$58,000,000. The nation provided a third of governmental contributions to the central UN budget. Of \$141,200,000 pledged the UN Korean Reconstruction agency from its origin to June 30, 1956, the U.S. had supplied \$92,900,000, or 66%. In 1956 the nation provided 56% of UN Children's fund receipts and 38% of those of the Refugee fund. Additional sums were given the United Nations Educational, Scientific and Cultural organization, the World Health organization and other UN groups. In all this, the attitude of the government was that "in practice, the United Nations had acquired major significance as an agency for influencing world opinion and for openly com-



BODY OF ALBEN WILLIAM BARKLEY, senator from Kentucky and former vice-president, lying in state, guarded by cadets from Virginia Military Institute, at Lexington, Va. Barkley died April 30, 1956

bating the political warfare and propaganda of world communism . . . [and it has] proved to be a significant center for diplomatic negotiation." Not all U.S. citizens saw the UN in this light, however, and some were calling for the exodus of the U.S. from the UN and the UN from the U.S., while others wanted the U.S.S.R. and its puppet states expelled. Nevertheless, the administration made full use of the Security council and general assembly as a forum during the Suez canal crisis, while the ordinary citizen seemed relieved that U.S. troops would not be included in the UN police force. (See also UNITED NATIONS.)

U.S. policy in 1956 was to maintain if possible what Secretary of State John Foster Dulles called "friendly impartiality toward both the Israelis and the Arabs." The administration did not arm the former, not through enmity but because, as the president put it, the 1,700,000 Israeli could never absorb arms in such quantity as the 40,000,000 Arabs. An announced intention to begin the financing of a high dam at Aswan in Egypt was abruptly withdrawn later. Some thought this made the U.S. partly responsible for the later troubles of the western powers.

In January-February British Prime Minister Sir Anthony Eden visited Washington, D.C., and signed a "declaration of Washington" after three days of talks. The document noted that in Europe ten formerly independent nations were being "compelled, against their will, to work for the glorification of the Soviet Communist state." But "we reject any thought that the cleavage we have described should be resolved by force. We shall never initiate violence." An accompanying statement indicated that an Israeli-Arab settlement was vital. Eden told the congress that unity of purpose ought to be declared whenever possible in areas of acute danger. In the Israeli-Arab situation, "we have done well to make clear that we are to discuss together what action we should take." On Feb. 6 he told the Canadian parliament that never before had there been so full a measure of agreement between his country and the U.S. White House Press Secretary James C. Hagerty released in April with the "full approval" of the president a statement that the nation would observe its UN charter commitments "within constitutional means" to oppose any aggression in the middle east. The U.S. was determined "to support and assist any nation which might be subjected

to such aggression." Earlier, the president had said that U.S. troops would not be sent into "anything that can be interpreted as war" until congress should direct such a step. These were all policy statements for the thoughtful citizen to ponder later in the year.

Events in the middle east and in Hungary in the autumn were viewed with great alarm. Few voices were raised in support of the British and French military action and none in favour of the Soviet. Frustration felt as the Hungarian revolution was crushed was only partially alleviated by prompt aid for the Hungarians who fled. Extension of economic aid to Great Britain and Europe to offset the loss of oil that resulted from blocking of the Suez canal was a near certainty, even though neither the people nor their leaders showed any sign of approving Anglo-French conduct. Neither Israel nor Egypt could be said to have gained many American friends by their actions in 1956, while the British lost much ground. Still, leaders of thought and persons in high office recognized that the true interests of the nation rested with the western powers; immoderate criticism was receding at year's end.

The Election.—The winter months of 1955-56 were spent in speculation about a second term for President Eisenhower. Urged to run by Republican leaders, he was attacked as a "part-time" president by opponents because of his coronary thrombosis of Sept. 24, 1955. All speculation ended Feb. 29 when he announced an affirmative decision. As a "recovered heart patient," he said, doctors felt that he could "continue to carry the burdens of the presidency," although a regime of ordered work activity would have to be mixed with regular amounts of exercise, recreation and rest. Interest in the future of Vice-Pres. Richard M. Nixon thereupon became intense. A controversial figure because of his unusually vigorous but effective campaigning in 1952 and 1954, Nixon had been energetic in office, visiting many countries, making policy speeches and participating fully in cabinet and National Security council meetings. He announced his candidacy April 26, and the president said that he was delighted.

Passing a physical examination May 12, the president was suddenly stricken in June with ileitis. After a 113-minute operation on June 9, full details were given unusually complete reporting in the press. Convalescence was normal, but the fact of two such dangerous illnesses in nine months and the vigorous Democratic attacks on Nixon guaranteed that the health of the president would be a campaign issue.

Meanwhile, Adlai E. Stevenson and Sen. Estes Kefauver were engaged in a struggle in Democratic state primaries. Victory by the latter in Minnesota made it look bad for the 1952 standard bearer. Both candidates wooed party leaders and voters aggressively and offered alternative solutions to national problems, but increasingly bitter personal references marred their campaigning. Stevenson finally accused his opponent of a policy of "destroy if you can't win" and of "wanting to win too much." Stevenson finally won in three major state primaries.

At the Democratic convention in Chicago, Ill., however, former Pres. Harry S. Truman, proclaiming himself no elder statesman, since "a statesman is just a dead politician, and I'm a very lively politician," announced himself for Gov. Averell Harriman of New York. Stevenson could not carry more than nine states, he said. Nevertheless, Stevenson handily won the nomination. In a dramatic announcement the victor told the delegates that the "free processes" of the convention should decide on his running mate, and they chose Kefauver over Sen. John F. Kennedy of Massachusetts.

The Democratic platform contained a compromise plank on civil rights. The national government, it promised, would be returned "to its rightful owners, the people of the United States." In general, the administration had "confused timidity with cour-

age and blindness with enlightenment." Paucity of ideas, impaired unity of the free world and "resentment rising against U.S. leadership everywhere" were the platform's attempted indictment against the incumbent leadership. Yet the party was not fundamentally opposed to many major U.S. policies. It favoured participation in the North Atlantic Treaty organization, opposed admission of Red China into the UN, desired continuation, after "realistic reappraisal," of the foreign aid program and was concerned over the plight of nations dominated by the Soviet Union even though not in favour of liberation by force. The platform agreed with earlier Stevenson-Kefauver pleas for supplying or selling arms to Israel. The Taft-Hartley law should be repealed and much new social security legislation enacted.

Meeting in San Francisco, Calif., the Republicans heard an inspirational address from former Pres. Herbert C. Hoover and quickly renominated the ticket of 1952, audible opposition to Nixon proving nonexistent. In his acceptance speech, Eisenhower warned that taking "the centralization short-cut every time something is to be done" would result in "a swollen, bureaucratic, monster Government in Washington, in whose shadow our state and local governments will ultimately wither and die." Both nominees admitted that there were still injustices in the land,

Nixon stating, "we believe in human welfare but not the welfare state"; still, "pockets of poverty" would have to be rooted out.

In the ensuing campaign, television was relied on by both parties, so that all four candidates campaigned in people's living rooms as never before and a new "homey" touch became the thing toward which to strive. Both Democratic candidates and Nixon stumped the country. Stevenson led the attack on the administration and called for "a New America," but he found himself engaged often in front-page debate with the vice-president. The issue of communism in government, so prominent in 1952, was insignificant in 1956. Stevenson outlined a major federal program on behalf of the country's aging citizens. He criticized the draft as fast becoming an obsolete way of maintaining the armed forces, but encountered quick opposition from both his opponents and little support elsewhere. Urging an end to H-bomb testing while contending that such tests could not really be kept secret from the world's scientists, he found the president unyielding and former President Truman had "no comment." On Oct. 17 Soviet Premier N. A. Bulganin wrote the president, "we fully share the opinion recently expressed by certain prominent figures in the United States concerning the necessity and the possibility of concluding an agreement on the matter of prohibiting atomic

Table III.—Major Legislation Passed by U.S. Congress in 1956

Act	House vote	Senate vote	Date of enactment
Tax Rate Extension Act of 1956 (Extended to April 1, 1957, corporate income tax and excise tax rates due to expire March 31, 1956)	366-4 Yeas: D. 198, R. 168 Nays: D. 1, R. 3 (March 13)	Passed by voice vote (March 26)	Signed March 29
Colorado River Storage Projects (Authorized expenditure of \$760,000,000 for the construction of a series of dams and related facilities in the upper Colorado river basin)	Passed by voice vote (March 28)	Passed by voice vote (March 28)	Signed April 11
Bank Holding Company Act of 1956 (Restricted acquisition by bank holding companies of stock in other banks and control over their directors)	Passed by voice vote (April 26)	Passed by voice vote (April 25)	Signed May 9
Agricultural Act of 1956 (Provided for acreage reserve and conservation reserve [soil bank] programs with voluntary and limited participation by farmers)	305-59 Yeas: D. 173, R. 132 Nays: D. 12, R. 47 (May 23)	Passed by voice vote (May 22)	Signed May 28
Federal-Aid Highway Act of 1956 (Authorized construction with federal aid of roads and highways to cost \$33,480,000,000 and to be financed in part by highway user taxes)	Passed by voice vote (June 26)	89-1 Yeas: D. 47, R. 42 Nays: D. 1, R. 0 (June 26)	Signed June 29
Defense Production Act—Extension (Extended until June 30, 1958, the authority of the president to allocate and fix priorities of critical and strategic materials and grant defense loans and subsidies under the Defense Production Act of 1950)	200-197 Yeas: D. 135, R. 65 Nays: D. 76, R. 121 (June 28)	Passed by voice vote (June 27)	Signed June 29
Department of Defense Appropriation Act, 1957 (Appropriated \$34,650,000,000 for U.S. armed forces in period July 1, 1956–June 30, 1957)	79-57 Ayes: 79 Nays: 57 (June 29)	Passed by voice vote (June 29)	Signed July 2
Public Debt Limit—Increase (Authorized extension for one year through June 30, 1957, of a temporary increase of \$3,000,000,000 in the public debt)	Passed by voice vote (June 21)	Passed by voice vote (July 3)	Signed July 9
Mutual Security Act of 1956 (Authorized appropriation of \$4,027,500,000 for U.S. economic, military and technical aid to foreign countries in period July 1, 1956–June 30, 1957)	Passed by voice vote (July 9)	Passed by voice vote (July 9)	Signed July 18
Narcotic Control Act of 1956 (Stiffened penalties for the illegal possession and sale of narcotics and permitted death penalty upon jury recommendation for sale to minors)	Passed by voice vote (July 9)	Passed by voice vote (July 9)	Signed July 18
Transportation Tax Exemption (Exempted from U.S. transportation tax, with some exceptions, travel from the U.S. to points in neighbouring countries and to the Caribbean and Central America)	Passed by voice vote (July 21)	Passed by voice vote (July 17)	Signed July 25
Federal Executive Pay Act of 1956 (Adjusted rates of compensation for heads of departments and other federal officials)	Passed by voice vote (July 26)	Passed by voice vote (July 26)	Signed July 31
Budgeting and Accounting Reforms (Provided for improvement of federal budgeting and accounting methods and procedures as recommended by the Commission on Organization of the Executive Branch of the Government)	Passed by voice vote (July 23)	Passed by voice vote (July 25)	Signed Aug. 1
Social Security Amendments of 1956 (Permitted women to receive benefits at age 62; provided for benefits to totally disabled persons over the age of 50; extended coverage to additional self-employed persons)	Passed by voice vote (July 26)	Passed by voice vote (July 27)	Signed Aug. 1
Customs Simplification Act of 1956 (Provided a single basis for valuation of imports in determination of customs duties and repealed obsolete requirements in customs procedures)	Passed by voice vote (July 21)	Passed by voice vote (July 25)	Signed Aug. 2
Kidnapping—F.B.I. Jurisdiction (Authorized F.B.I. to initiate investigation of any kidnapping in which the victim had not been released within 24 hours instead of seven days as provided under prior law)	Passed by voice vote (July 23)	Passed by voice vote (July 27)	Signed Aug. 6
Federal Flood Insurance Act of 1956 (Provided for a federal flood insurance program)	Passed by voice vote (July 27)	Passed by voice vote (July 27)	Signed Aug. 7
Housing Act of 1956 (Liberalized rules for the guarantee of mortgages and other means of home financing; authorized 35,000 public housing units a year for two years)	Passed by voice vote (July 27)	Passed by voice vote (July 27)	Signed Aug. 7
Automobile Dealers Act (Gave automobile dealers a new cause of action against manufacturers who terminate dealer franchises without good faith)	146-45 Ayes: 146 Nays: 45 (July 23)	Passed by voice vote (July 25)	Signed Aug. 8 (J. W. Mw.)



PRESS CONFERENCE held at the Pentagon, Washington, D.C., in May 1956 by Secretary of Defense Charles E. Wilson (centre) and the leaders of the U.S. military services as the nation became concerned over reports of quarrels among military leaders. Shown in the photograph (from left to right): Gen. Nathan F. Twining, air force chief of staff; Donald A. Quarles, air force secretary; Gen. Maxwell D. Taylor, army chief of staff; Charles C. Finucane, undersecretary of the army; Wilson; Adm. Arthur W. Radford, chairman of the joint chiefs of staff; Charles S. Thomas, navy secretary; Adm. Arleigh A. Burke, chief of naval operations; and Gen. Randolph McC. Pate, marine corps commandant

weapon tests. . . ." The statement embarrassed the Democrats, and Eisenhower bluntly termed it an interference by a foreign nation in U.S. internal affairs.

It was reported that 62% of 1,760 newspapers supported Eisenhower editorially, while 15% backed Stevenson.

Much campaign oratory was devoted to such issues as inflation, price supports for farm crops, the soil bank program, the influence of big business on government, federal aid to education, assignment of credit for the Social Security act amendments and for ending the war in Korea, and other issues real or contrived. To the Republicans, the cost of living had been "remarkably stabilized"; to the Democrats, it was at "the highest point in history."

Despite partisanship in the campaign, on vital matters the parties stood together. Both stood for peace, for a strong and secure nation, for considerable reliance on the UN, for continuing close and friendly relations with Great Britain, France, Japan and peoples to the south, and for measures calculated to diminish Soviet influence.

The repudiation of the two Democratic candidates at the polls was overwhelming. They won only seven states with 73 electoral votes, and the final vote stood at 35,584,135 to 26,036,080. After several days of indecision, the senate stabilized at 49 Democrats and 47 Republicans, and the house of representatives seemed likely to have 234 Democrats to 201 Republicans. Democrats won half of 30 governorships, gaining five formerly Republican seats, while the Republicans gained in three. Only once before in American history (1848) had the presidential office been won by a party that did not achieve a majority in either house of congress. (See also ELECTIONS, U.S.; POLITICAL PARTIES, U.S.)

The postelection statements and conduct of victorious and defeated candidates for offices throughout the land particularly heartened Americans at a time when it was so clear that in many lands popular will was not to be accepted as final. After his second defeat for the presidency, Stevenson, still much admired by many, wryly termed himself "the foremost authority on unsuccessful presidential campaigns" and said he would not run again. He said he had tried "to set forth a philosophy, a faith and even suggest a program for modern liberalism. I think that I have done that . . . and . . . I have no doubt at all that many of the views and ideas I have tried to express will ultimately

prevail." The augmented stature of Nixon was evident when he made a major foreign policy address in December.

Economic Developments.—Annual personal income in the nation continued to increase during 1956. From \$78,600,000,000 in 1940, it had grown to \$306,000,000,000 in 1955 and \$324,200,000,000 in fiscal 1955-56. The consumer price index for all items rose from 114.8 to 116.2 in the two years following June 1954. Money became hard to borrow during the year, as the federal reserve board sought to control inflation by repeatedly increasing the discount rate. Financing of homes became difficult, and the Federal Housing administration's interest rate was raised 0.5%. Interest paid investors by many banks and savings and loan institutions also increased.

The federal government collected \$75,100,000,000 in taxes in 1955-56, an increase of 13% in a year. Corporate taxes were \$21,300,000,000 of this, and individual payments were \$42,600,000,000. To the federal tax burden were added the taxes of states, counties, school districts and other jurisdictions. If services by government were greater than ever before, so was the annual cost to the taxpayer.

A steel strike and a longshoremen's strike made news in 1956. The ratio of private to public building construction seemed stabilized at about two to one. Average wages went up somewhat, although irregularly among occupations. The peculiarities of the stock market worried amateur investors and puzzled others, but the former were comforted by their outright ownership of shares in most cases, and professionals were convinced that annual inflation would make the long trend upward. (See also BUDGET, NATIONAL; BUILDING AND CONSTRUCTION INDUSTRY; DEBT, NATIONAL; HOUSING; INCOME AND PRODUCT, U.S.; PRICES; TAXATION; WAGES AND HOURS.)

(V. D. B.)

Foreign Credits of the U.S. Government.—U.S. government foreign credit programs are more important than they appear to be from the figures on net foreign lending in recent years. The volume of offsetting new outflows and principal repayments has continued to approximate \$500,000,000 annually, but with significant shifts in the geographical distribution of the new money made available. New disbursements of \$472,000,000 in the fiscal year ended June 30, 1956, were an important component of the assistance given by the United States in the development of productive economies in underdeveloped countries. These credit disbursements represented more than one-fifth of the gross non-military grant and credit transfers under U.S. government foreign assistance programs in the fiscal year. Recent congressional actions clearly indicated the increased use of repayable assistance—particularly when for productive development—wherever possible.

Annual disbursement increased 6% in fiscal 1956. Although

Table IV.—Foreign Credits of the U.S. Government—by Collecting Agency and by Country, June 30, 1956

	Total	Outstanding	Unutilized commitments		Total	Outstanding	Unutilized commitments
Total	\$12,710,946,000*	\$11,755,110,000	\$955,836,000*				
By collecting agency:				Australia	\$ 17,424,000	\$ 17,424,000	
Commerce department				Austria	11,831,000	7,296,000	\$ 4,535,000
(Merchant ships) . . .	55,055,000	55,055,000		Belgium-Luxembourg . .	143,933,000	143,933,000	
Defense department				Belgium	140,960,000	140,960,000	
(Surplus property) . . .	20,000,000	20,000,000		Luxembourg	2,973,000	2,973,000	
Export-Import bank:				Burma	1,925,000	1,925,000	
For own account (in-				Canada	3,324,000	699,000	2,625,000
cluding agent-bank				China-Formosa	173,743,000	171,585,000	2,158,000
loans)	3,388,347,000	2,648,266,000	740,081,000	Czechoslovakia	4,870,000	4,870,000	
For mutual security pro-				Denmark	48,874,000	48,870,000	4,000
gram	2,052,096,000	1,868,118,000	183,978,000	Egypt	7,740,000		7,740,000
Prior grants converted				Ethiopia-Eritrea	27,979,000	3,979,000	24,000,000
into credits	1,000,000,000	1,000,000,000		Finland	95,810,000	95,810,000	
Under Agricultural				France and possessions .	1,741,420,000	1,741,420,000	
Trade Development				France	1,737,130,000	1,737,130,000	
and Assistance act . . .	105,490,000	84,615,000	20,875,000	Algeria	544,000	544,000	
For Office of Defense				French Equatorial			
Mobilization	38,597,000	30,319,000	8,278,000	Africa	3,747,000	3,747,000	
Loans of the Reconstruc-				Germany	1,184,625,000	1,174,591,000	10,034,000
tion Finance Corpo-				Greece	101,578,000	91,745,000	9,833,000
ration	33,196,000	33,196,000		Hungary	11,949,000	11,949,000	
General Services Admin-				Iceland	5,550,000	5,550,000	
istration:				India	439,763,000	379,283,000	60,480,000
Strategic materials . .	76,232,000	73,607,000	2,625,000	Indonesia	167,454,000	140,486,000	26,968,000
Surplus property . . .	8,263,000	8,263,000		Iran	120,287,000	66,596,000	53,691,000
International Cooperation				Iraq	210,000		210,000
administration (strate-				Ireland	127,879,000	127,879,000	
gic materials)	28,751,000	28,751,000		Israel	168,946,000	152,585,000	16,361,000
State department (United				Italy	285,329,000	259,615,000	25,714,000
Nations headquarters				Japan	153,178,000	118,157,000	35,021,000
loan)	58,000,000	58,000,000		Korea	20,950,000	20,950,000	
Treasury department:				Liberia	40,626,000	23,076,000	17,550,000
British loan	3,519,272,000	3,519,272,000		Morocco	5,593,000	5,584,000	9,000
Prior grants converted				Netherlands	272,894,000	272,894,000	
into credits	1,136,953,000	1,136,953,000		New Zealand	19,036,000	15,968,000	3,068,000
Surplus property . . .	893,572,000	893,572,000		Norway	92,586,000	92,586,000	
Lend-lease current				Pakistan	61,000,000	22,743,000	38,257,000
credits and silver . . .	273,617,000	273,617,000		Philippines	159,785,000	78,228,000	81,557,000
Philippine funding . .	23,498,000	23,498,000		Poland	61,395,000	61,395,000	
Institute of Inter-Amer-				Portugal and possession .	51,856,000	51,756,000	100,000
ican Affairs	7,000	7,000		Portugal	51,756,000	51,756,000	
By country:				Angola	100,000		100,000
American republics . .	1,345,244,000	908,396,000	436,848,000	Rhodesia	56,648,000	49,670,000	6,978,000
Argentina	136,143,000	76,143,000	60,000,000	Saudi Arabia	21,243,000	21,243,000	
Bolivia	35,745,000	34,678,000	1,067,000	Spain	104,569,000	87,302,000	17,267,000
Brazil	565,942,000	460,321,000	105,621,000	Sweden	20,061,000	20,035,000	26,000
Chile	73,484,000	65,258,000	8,226,000	Syria	50,000	50,000	
Colombia	25,635,000	24,126,000	1,509,000	Thailand	12,089,000	1,261,000	10,828,000
Costa Rica	19,415,000	10,025,000	9,390,000	Turkey	141,589,000	114,798,000	26,791,000
Cuba	22,052,000	12,000,000	10,052,000	Union of South Africa .	139,102,000	118,021,000	21,081,000
Ecuador	32,061,000	25,694,000	6,367,000	U.S.S.R.	222,493,000	222,493,000	
El Salvador	98,000		98,000	United Kingdom and de-			
Guatemala	2,619,000	571,000	2,048,000	pendencies	4,537,565,000	4,537,565,000	
Haiti	30,646,000	26,170,000	4,476,000	United Kingdom . . .	4,520,007,000	4,520,007,000	
Honduras	66,000		66,000	British East Africa . .	2,312,000	2,312,000	
Mexico	204,952,000	119,368,000	85,584,000	British Guiana	128,000	128,000	
Nicaragua	660,000	420,000	240,000	Jamaica	15,081,000	15,081,000	
Panama	1,036,000	1,006,000	30,000	Nigeria	37,000	37,000	
Paraguay	8,057,000	515,000	7,542,000	Vietnam	25,000,000	25,000,000	
Peru	149,446,000	26,202,000	123,244,000	Yugoslavia	50,011,000	50,011,000	
Uruguay	11,430,000	8,757,000	2,673,000	International organiza-			
Venezuela	12,106,000	7,953,000	4,153,000	tions:			
Unspecified	13,650,000	9,188,000	4,462,000	European Coal and			
Afghanistan	45,934,000	29,834,000	16,100,000	Steel Community . .	100,000,000	100,000,000	
				United Nations	58,000,000	58,000,000	

*Does not include \$1,611,653,000 authorized by legislation but not committed by the Export-Import bank as of June 30, 1956, nor indeterminate amounts authorized by legislation but not committed for mutual security program loans and loans under the Agricultural Trade Development and Assistance act.

Source: Office of Business Economics, U.S. Department of Commerce.

Export-Import bank loan disbursements were off \$76,000,000, utilization of mutual security program loans increased \$28,000,000, and \$85,000,000 was disbursed abroad for multilateral trade and economic development from foreign currencies obtained through the sale of farm products under the Agricultural Trade Development and Assistance act.

Principal collections in fiscal year 1956 exceeded \$511,000,000, an increase of 11% over the preceding 12-month period. Significant factors in this rise were the increased returns of lend-lease silver borrowed during and immediately after World War II and scheduled for return in 1957, and the accelerated repayment by France in Dec. 1955 of \$26,000,000 on the balance of merchant ship sales credits extended in the early postwar period. The rise in principal collections decreased the outstanding long-term indebtedness of foreign governments and other foreign entities to the U.S. government—excluding World War I debts—to \$11,755,000,000 at the end of June 1956. Approximately \$75,000,000 of this outstanding principal indebtedness had been due and unpaid for 90 days or more. Repayment of the rest of the indebtedness was scheduled throughout the remainder of the 20th century.

On the outstanding credits, the U.S. government collected \$271,000,000 in interest in fiscal year 1956, approximately 2.3% on the average amount outstanding. Although interest rates on

new loans extended exceeded 3%, average interest collections were off in the year because many of the new mutual security loans did not require interest payments for an initial period of up to four years. Also, the decline in indebtedness to the Export-Import bank reflected repayment of loans generally earning higher than average rates. Accelerated principal repayments, such as that made by France, were on outstanding credits with interest rates above average.

More than half the fiscal year 1956 repayments were made by European countries, with major repayments from France (\$92,000,000) and the United Kingdom (\$72,000,000). Significant disbursements in Europe included \$32,000,000 to Spain, \$25,000,000 to Turkey and \$23,000,000 to Greece, all economically underdeveloped countries.

Large repayments were also made by Brazil (\$72,000,000) and Japan (\$60,000,000). During the year these two countries were the principal recipients of new disbursements, which aggregated \$39,000,000 and \$117,000,000, respectively. The utilizations and repayments by Japan each continued to include about \$60,000,000 in activity on relatively short-term credits extended by the Export-Import bank (and disbursed by the bank and its commercial agent banks) for the purchase of U.S. cotton.

The geographical shift in new disbursements toward increasing economic development was evident during the fiscal year



"TOKYO ROSE," Mrs. Iva D'Aquino, being interviewed after release from the federal women's reformatory, Alderson, W.Va., Jan. 28, 1956. She had served a six-year term for treasonable acts during World War II when she broadcast propaganda from Japan urging U.S. troops in the Pacific area to surrender to the Japanese

in the new disbursements to Israel (\$27,000,000), Vietnam (\$25,000,000), India (\$22,000,000) and Formosa (China) (\$18,000,000).

In fiscal year 1956, new foreign loan commitments by the U.S. government aggregated \$631,000,000, one-eighth less than in the previous 12-month period. Expirations and cancellations of unutilized commitments totalled \$52,000,000 in the year. Noteworthy annual increases in unutilized commitments resulted from such widespread new commitments for industrial or economic development as \$77,000,000 to the Philippines, \$56,000,000 to Mexico and \$24,000,000 to Ethiopia.

(See FOREIGN AID PROGRAMS, U.S.)

(E. S. K.)

Education.—See the articles EDUCATION; UNIVERSITIES AND COLLEGES.

Defense.—For information about the armed forces of the United States in 1956, see ARMIES OF THE WORLD; AVIATION, MILITARY; COAST GUARD, U.S.; MARINE CORPS, U.S.; NATIONAL GUARD; NAVIES OF THE WORLD; SELECTIVE SERVICE, U.S.

Finance and Banking.—Statistics pertaining to the United States will be found in such articles as BANKING; BUDGET, NATIONAL; BUSINESS REVIEW; CONSUMER CREDIT; DEBT, NATIONAL; EXPORT-IMPORT BANK OF WASHINGTON; FEDERAL DEPOSIT INSURANCE CORPORATION; FEDERAL RESERVE SYSTEM; FOREIGN INVESTMENTS; INCOME AND PRODUCT, U.S.; SAVINGS AND LOAN ASSOCIATIONS; STOCKS AND BONDS; TAXATION; WEALTH AND INCOME, DISTRIBUTION OF; WAGES AND HOURS.

Foreign Trade.—See the articles BUSINESS REVIEW; EXCHANGE CONTROL AND EXCHANGE RATES; EXPORT-IMPORT BANK OF WASHINGTON; FOREIGN INVESTMENTS; INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT; INTERNATIONAL MONETARY FUND; INTERNATIONAL TRADE; TARIFFS.

Communications.—For statistics, see the articles AVIATION, CIVIL; CANALS AND INLAND WATERWAYS; MERCHANT MARINE; MOTOR TRANSPORTATION; POST OFFICE; RADIO AND TELEVISION; RAILROADS; ROADS AND HIGHWAYS; SHIPBUILDING; TELEGRAPHY; TELEPHONE; URBAN TRANSPORTATION, U.S.

Agriculture.—Statistical material pertaining to this subject may be found under AGRICULTURE; also in separate articles on the principal crops and agricultural products.

Mineral Production.—See separate articles on the principal minerals; also MINERAL AND METAL PRODUCTION AND PRICES.

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(V. D. B.)

United States Congress. The 85th congress, which convened for its first session on Jan. 3, 1957, was comprised of the following members as of that date:

United States Senate

Presiding Officer: Richard M. Nixon (vice-president of the United States).

Majority Leader: Lyndon B. Johnson of Texas.

Minority Leader: William F. Knowland of California.

Democrats: 49, Republicans: 47.

State	Name	Party	Term Expires	Residence
Ala.	Sparkman, John Hill, Lister	Dem.	1961	Huntsville
		Dem.	1963	Montgomery
Ariz.	Goldwater, Barry Hayden, Carl	Rep.	1959	Phoenix
		Dem.	1963	Phoenix
Ark.	McClellan, John L. Fulbright, J. W.	Dem.	1961	Camden
		Dem.	1963	Fayetteville
Calif.	Knowland, William F. Kuchel, Thomas H.	Rep.	1959	Piedmont
		Rep.	1963	Anaheim
Colo.	Allott, Gordon Carroll, John A.	Rep.	1961	Lamar
		Dem.	1963	Denver
Conn.	Purtell, William A. Bush, Prescott	Rep.	1959	West Hartford
		Rep.	1963	Greenwich
Del.	Williams, John J. Frear, J. Allen, Jr.	Rep.	1959	Millsboro
		Dem.	1961	Dover
Fla.	Holland, Spessard L. Smathers, George A.	Dem.	1959	Bartow
		Dem.	1963	Miami

State	Name	Party	Term Expires	Residence
Ga.	Russell, Richard B. Talmadge, Herman E.	Dem.	1961	Winder
		Dem.	1963	Lovejoy
Ida.	Dworshak, Henry C. Church, Frank	Rep.	1961	Burley
		Dem.	1963	Boise
Ill.	Douglas, Paul H. Dirksen, Everett McKinley	Dem.	1961	Chicago
		Rep.	1963	Pekin
Ind.	Jenner, William E. Capehart, Homer E.	Rep.	1959	Bedford
		Rep.	1963	Washington
Iowa	Martin, Thomas E. Hickenlooper, Bourke B.	Rep.	1961	Iowa City
		Rep.	1963	Cedar Rapids
Kan.	Schoeppel, Andrew F. Carlson, Frank	Rep.	1961	Wichita
		Rep.	1963	Concordia
Ky.	Cooper, John Sherman Morton, Thruston B.	Rep.	1961	Somerset
		Rep.	1963	Glenview
La.	Ellender, Allen J. Long, Russell B.	Dem.	1961	Houma
		Dem.	1963	Baton Rouge
Me.	Payne, Frederick G. Smith, Margaret Chase	Rep.	1959	Waldoboro
		Rep.	1961	Skowhegan
Md.	Beall, J. Glenn Butler, John Marshall	Rep.	1959	Frostburg
		Rep.	1963	Baltimore
Mass.	Kennedy, John F. Saltonstall, Leverett	Dem.	1959	Boston
		Rep.	1961	Dover
Mich.	Potter, Charles E. McNamara, Patrick V.	Rep.	1959	Cheboygan
		Dem.	1961	Detroit
Minn.	Thye, Edward J. Humphrey, Hubert H.	Rep.	1959	Northfield
		Dem.	1961	Minneapolis
Miss.	Stennis, John C. Eastland, James O.	Dem.	1959	De Kalb
		Dem.	1961	Doddsville
Mo.	Symington, Stuart. Hennings, Thomas C., Jr.	Dem.	1959	Creve Coeur
		Dem.	1963	St. Louis
Mont.	Mansfield, Mike Murray, James E.	Dem.	1959	Missoula
		Dem.	1961	Butte
Neb.	Hruska, Roman L. Curtis, Carl T.	Rep.	1959	Omaha
		Rep.	1961	Minden
Nev.	Malone, George W. Bible, Alan	Rep.	1959	Reno
		Dem.	1963	Reno
N.H.	Bridges, Styles Cotton, Norris	Rep.	1961	Concord
		Rep.	1963	Lebanon
N.J.	Smith, H. Alexander Case, Clifford P.	Rep.	1959	Princeton
		Rep.	1961	Rahway
N.M.	Chavez, Dennis Anderson, Clinton P.	Dem.	1959	Albuquerque
		Dem.	1961	Albuquerque
N.Y.	Ives, Irving M. Javits, Jacob K.	Rep.	1959	Norwich
		Rep.	1963	New York City
N.C.	Scott, W. Kerr Ervin, Sam J., Jr.	Dem.	1961	Haw River
		Dem.	1963	Morganton
N.D.	Langer, William Young, Milton R.	Rep.	1959	Bismarck
		Rep.	1963	La Moure
Ohio	Bricker, John W. Lausche, Frank J.	Rep.	1959	Columbus
		Dem.	1963	Cleveland
Okla.	Kerr, Robert S. Monroney, A. S. Mike	Dem.	1961	Oklahoma City
		Dem.	1963	Oklahoma City
Ore.	Neuberger, Richard L. Morse, Wayne	Dem.	1961	Portland
		Dem.	1963	Eugene
Pa.	Martin, Edward Clark, Joseph S., Jr.	Rep.	1959	Washington
		Dem.	1963	Philadelphia
R.I.	Pastore, John O. Green, Theodore Francis	Dem.	1959	Providence
		Dem.	1961	Providence
S.C.	Thurmond, J. Strom Johnston, Olin D.	Dem.	1961	Aiken
		Dem.	1963	Spartanburg
S.D.	Mundt, Karl E. Case, Francis	Rep.	1961	Madison
		Rep.	1963	Custer
Tenn.	Gore, Albert Kefauver, Estes	Dem.	1959	Carthage
		Dem.	1961	Chattanooga
Tex.	Daniel, Price Johnson, Lyndon B.	Dem.	1959	Liberty
		Dem.	1961	Johnson City
Utah	Watkins, Arthur V. Bennett, Wallace F.	Rep.	1959	Orem
		Rep.	1963	Salt Lake City
Vt.	Flanders, Ralph E. Aiken, George D.	Rep.	1959	Springfield
		Rep.	1963	Putney
Va.	Byrd, Harry F. Robertson, A. Willis	Dem.	1959	Berryville
		Dem.	1961	Lexington
Wash.	Jackson, Henry M. Magnuson, Warren G.	Dem.	1959	Everett
		Dem.	1963	Seattle
W.Va.	Revercomb, Chapman. Neely, Matthew M.	Rep.	1959	Charleston
		Dem.	1961	Fairmont
Wis.	McCarthy, Joseph R. Wiley, Alexander	Rep.	1959	Appleton
		Rep.	1963	Chippewa Falls
Wyo.	Barrett, Frank A. O'Mahoney, Joseph C.	Rep.	1959	Lusk
		Dem.	1961	Cheyenne

¹Elected Nov. 6, 1956, to serve unexpired term.

United States House of Representatives (* served in 84th congress; † served in a previous congress).

Speaker: Sam Rayburn of Texas.

Majority Leader: John W. McCormack of Massachusetts.

Minority Leader: Joseph W. Martin, Jr., of Massachusetts.

Democrats: 233; Republicans: 200; vacancies: 2.

State	Dist.	Name	Party	Residence	State	Dist.	Name	Party	Residence
Ala.	1	*Boykin, Frank W.	Dem.	Mobile	15	*Mason, Noah M.	Rep.	Oglesby	
	2	*Grant, George M.	Dem.	Troy	16	*Allen, Leo E.	Rep.	Galena	
	3	*Andrews, George W.	Dem.	Union Springs	17	*Arends, Leslie C.	Rep.	Melvin	
	4	*Roberts, Kenneth A.	Dem.	Anniston	18	Michel, Robert H.	Rep.	Peoria	
	5	*Rains, Albert	Dem.	Gadsden	19	*Chiperfield, Robert B.	Rep.	Canton	
	6	*Selden, Armistead I., Jr.	Dem.	Greensboro	20	*Simpson, Sid	Rep.	Carrollton	
	7	*Elliott, Carl	Dem.	Jasper	21	*Mack, Peter F., Jr.	Dem.	Carlinville	
	8	*Jones, Robert E.	Dem.	Scottsboro	22	*Springer, William L.	Rep.	Champaign	
	9	*Huddleston, George, Jr.	Dem.	Birmingham	23	*Vursell, Charles W.	Rep.	Salem	
Ariz.	1	*Rhodes, John J.	Rep.	Mesa	24	*Price, Melvin	Dem.	East St. Louis	
	2	*Udall, Stewart L.	Dem.	Tucson	25	*Gray, Kenneth J.	Dem.	West Frankfort	
Ark.	1	*Gathings, E. C.	Dem.	West Memphis	Ind.	1	*Madden, Ray J.	Dem.	Gary
	2	*Mills, Wilbur D.	Dem.	Kensett		2	*Halleck, Charles A.	Rep.	Rensselaer
	3	*Trimble, James W.	Dem.	Berryville		3	Nimtz, F. Jay	Rep.	South Bend
	4	*Harris, Oren	Dem.	El Dorado		4	*Adair, E. Ross	Rep.	Fort Wayne
	5	*Hays, Brooks	Dem.	Little Rock		5	*Beamer, John V.	Rep.	Wabash
	6	*Norrell, W. F.	Dem.	Monticello		6	*Harden, Cecil M.	Rep.	Covington
Calif.	1	*Scudder, Hubert B.	Rep.	Sebastopol		7	*Bray, William G.	Rep.	Martinsville
	2	*Engle, Clair	Dem.	Red Bluff		8	*Denton, Winfield K.	Dem.	Evansville
	3	*Moss, John E.	Dem.	Sacramento		9	*Wilson, Earl	Rep.	Bedford
	4	*Mailliard, William S.	Rep.	San Francisco		10	*Harvey, Ralph	Rep.	New Castle
	5	*Shelley, John F.	Dem.	San Francisco		11	*Brownson, Charles B.	Rep.	Indianapolis
	6	*Baldwin, John F., Jr.	Rep.	Martinez	Iowa	1	*Schwengel, Fred	Rep.	Davenport
	7	*Allen, John J., Jr.	Rep.	Oakland		2	*Talle, Henry O.	Rep.	Decorah
	8	*Miller, George P.	Dem.	Alameda		3	*Gross, H. R.	Rep.	Waterloo
	9	*Younger, J. Arthur	Rep.	San Mateo		4	*LeCompte, Karl M.	Rep.	Corydon
	10	*Gubser, Charles S.	Rep.	Gilroy		5	*Cunningham, Paul	Rep.	Des Moines
	11	McFall, John J.	Dem.	Manteca		6	Coad, Merwin	Dem.	Boone
	12	*Sisk, B. F.	Dem.	Fresno		7	*Jensen, Ben F.	Rep.	Exira
	13	*Teague, Charles M.	Rep.	Ojai		8	*Hoeven, Charles B.	Rep.	Alton
	14	*Hagen, Harlan	Dem.	Hanford	Kan.	1	*Avery, William H.	Rep.	Wakefield
	15	*McDonough, Gordon L.	Rep.	Los Angeles		2	*Scrivner, Errett P.	Rep.	Kansas City
	16	*Jackson, Donald L.	Rep.	Santa Monica		3	*George, Myron V.	Rep.	Altamont
	17	*King, Cecil R.	Dem.	Los Angeles		4	*Rees, Edward H.	Rep.	Emporia
	18	*Hosmer, Craig	Rep.	Long Beach		5	Breeding, J. Floyd	Dem.	Rolla
	19	*Holifield, Chet	Dem.	Montebello		6	*Smith, Wint	Rep.	Mankato
	20	Smith, H. Allen	Rep.	Glendale	Ky.	1	*Gregory, Noble J.	Dem.	Mayfield
	21	*Hiestand, Edgar W.	Rep.	Altadena		2	*Natcher, William H.	Dem.	Bowling Green
	22	*Holt, Joe	Rep.	Van Nuys		3	*Robison, John M., Jr.	Rep.	Louisville
	23	*Doyle, Clyde	Dem.	South Gate		4	*Chelf, Frank L.	Dem.	Lebanon
	24	*Lipscomb, Glenard P.	Rep.	Los Angeles		5	*Spence, Brent	Dem.	Fort Thomas
	25	*Hillings, Patrick J.	Rep.	Arcadia		6	*Watts, John C.	Dem.	Nicholasville
	26	*Roosevelt, James	Dem.	Los Angeles		7	*Perkins, Carl D.	Dem.	Hindman
	27	*Sheppard, Harry R.	Dem.	Yucaipa		8	*Siler, Eugene	Rep.	Williamsburg
	28	*Utt, James B.	Rep.	Santa Ana	La.	1	*Hébert, F. Edward	Dem.	New Orleans
	29	Saund, D. S.	Dem.	Westmoreland		2	*Boggs, Hale	Dem.	New Orleans
	30	*Wilson, Robert C.	Rep.	Chula Vista		3	*Willis, Edwin E.	Dem.	St. Martinville
Colo.	1	*Rogers, Byron G.	Dem.	Denver		4	*Brooks, Overton	Dem.	Shreveport
	2	*Hill, William S.	Rep.	Fort Collins		5	*Passman, Otto E.	Dem.	Monroe
	3	*Chenoweth, J. Edgar	Rep.	Trinidad		6	*Morrison, James H.	Dem.	Hammond
	4	*Aspinall, Wayne N.	Dem.	Palisade		7	*Thompson, T. A.	Dem.	Ville Platte
Conn.	1	May, Edwin H., Jr.	Rep.	Wethersfield		8	*Long, George S.	Dem.	Pineville
	2	*Seely-Brown, Horace, Jr.	Rep.	Pomfret Center	Me.	1	*Hale, Robert	Rep.	Portland
	3	*Cretella, Albert W.	Rep.	North Haven		2	Coffin, Frank M.	Dem.	Lewiston
	4	*Morano, Albert P.	Rep.	Greenwich		3	*McIntire, Clifford G.	Rep.	Perham
	5	*Patterson, James T.	Rep.	Naugatuck	Md.	1	*Miller, Edward T.	Rep.	Easton
	*Sadlak, Antoni N.	Rep.	Rockville	2		*Devereux, James P. S.	Rep.	Stevenson	
Del.		Haskell, Harry G., Jr.	Rep.	Wilmington		3	*Garmatz, Edward A.	Dem.	Baltimore
						4	*Fallon, George H.	Dem.	Baltimore
Fla.	1	*Cramer, William C.	Rep.	St. Petersburg		5	*Lankford, Richard E.	Dem.	Annapolis
	2	*Bennett, Charles E.	Dem.	Jacksonville		6	*Hyde, DeWitt S.	Rep.	Bethesda
	3	*Sikes, Robert L. F.	Dem.	Crestview		7	*Friedel, Samuel N.	Dem.	Baltimore
	4	*Fascell, Dante B.	Dem.	Miami	Mass.	1	*Heseltun, John W.	Rep.	Deerfield
	5	*Herlong, A. S., Jr.	Dem.	Leesburg		2	*Eoland, Edward P.	Dem.	Springfield
	6	*Rogers, Paul G.	Dem.	West Palm Beach		3	*Philbin, Philip J.	Dem.	Clinton
	7	*Haley, James A.	Dem.	Sarasota		4	*Donohue, Harold D.	Dem.	Worcester
	8	*Matthews, D. R.	Dem.	Gainesville		5	*Rogers, Edith Nourse	Rep.	Lowell
Ga.	1	*Preston, Prince H.	Dem.	Statesboro		6	*Bates, William H.	Rep.	Salem
	2	*Pilcher, J. L.	Dem.	Meigs		7	*Lane, Thomas J.	Dem.	Lawrence
	3	*Forrester, E. L.	Dem.	Leesburg		8	*Macdonald, Torbert H.	Dem.	Malden
	4	*Flynt, John J., Jr.	Dem.	Griffin		9	*Nicholson, Donald W.	Rep.	Wareham
	5	*Davis, James C.	Dem.	Stone Mountain		10	*Curtis, Laurence	Rep.	Boston
	6	*Vinson, Carl	Dem.	Milledgeville		11	*O'Neill, Thomas P., Jr.	Dem.	Cambridge
	7	*Lanham, Henderson	Dem.	Rome		12	*McCormack, John W.	Dem.	Dorchester
	8	*Blitch, Iris Faircloth.	Dem.	Homerville		13	*Wigglesworth, Richard B.	Rep.	Milton
	9	*Landrum, Phil M.	Dem.	Jasper		14	*Martin, Joseph W., Jr.	Rep.	North Attleboro
	10	*Brown, Paul	Dem.	Elberton	Mich.	1	*Machrowicz, Thaddeus M.	Dem.	Hamtramck
Ida.	1	*Pfost, Gracie	Dem.	Nampa		2	*Meader, George	Rep.	Ann Arbor
	2	*Budge, Hamer H.	Rep.	Boise		3	*Johansen, August E.	Rep.	Battle Creek
Ill.	1	*Dawson, William L.	Dem.	Chicago		4	*Hoffman, Clare E.	Rep.	Allegan
	2	*O'Hara, Barratt	Dem.	Chicago		5	*Ford, Gerald R., Jr.	Rep.	Grand Rapids
	3	Byrne, Emmet F.	Rep.	Chicago		6	Chamberlain, Charles E.	Rep.	East Lansing
	4	*McVey, William E.	Rep.	Harvey		7	McIntosh, Robert J.	Rep.	Port Huron
	5	*Kluczynski, John C.	Dem.	Chicago		8	*Bentley, Alvin M.	Rep.	Owosso
	6	*O'Brien, Thomas J.	Dem.	Chicago		9	Griffin, Robert P.	Rep.	Traverse City
	7	*Bowler, James B.	Dem.	Chicago		10	*Cederberg, Elford A.	Rep.	Bay City
	8	*Gordon, Thomas S.	Dem.	Chicago		11	*Knox, Victor A.	Rep.	Sault Ste. Marie
	9	*Yates, Sidney R.	Dem.	Chicago		12	*Bennett, John B.	Rep.	Ontonagon
	10	Collier, Harold R.	Rep.	Berwyn		13	*Diggs, Charles C., Jr.	Dem.	Detroit
	11	*Sheehan, Timothy P.	Rep.	Chicago		14	*Rabaut, Louis C.	Dem.	Grosse Pointe Park
	12	*Boyle, Charles A.	Dem.	Chicago		15	*Dingell, John D., Jr.	Dem.	Detroit
	13	*Church, Marguerite Stitt	Rep.	Evanston		16	*Lesinski, John	Dem.	Dearborn
	14	Keeney, Russell W.	Rep.	Wheaton		17	*Griffiths, Martha W.	Dem.	Detroit
				18		Broomfield, William S.	Rep.	Royal Oak	

UNITED STATES CONGRESS

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State	Dist.	Name	Party	Residence	State	Dist.	Name	Party	Residence
Minn.	1	*Andresen, August H.	Rep.	Red Wing	N.C.	1	*Bonner, Herbert C.	Dem.	Washington
	2	*O'Hara, Joseph P.	Rep.	Glencoe		2	*Fountain, L. H.	Dem.	Tarboro
	3	*Wier, Roy W.	Dem.	Minneapolis		3	*Barden, Graham A.	Dem.	New Bern
	4	*McCarthy, Eugene J.	Dem.	St. Paul		4	*Cooley, Harold D.	Dem.	Nashville
	5	*Judd, Walter H.	Rep.	Minneapolis		5	Scott, Ralph J.	Dem.	Danbury
	6	*Marshall, Fred	Dem.	Grove City (R.F.D.)		6	*Durham, Carl T.	Dem.	Chapel Hill
	7	*Andersen, H. Carl	Rep.	Tyler		7	†Lennon, Alton	Dem.	Wilmington
	8	*Blatnik, John A.	Dem.	Chisholm		8	Kitchin, A. Paul	Dem.	Wadesboro
	9	*Knutson, Coysa	Dem.	Oklee		9	*Alexander, Hugh Q.	Dem.	Kannapolis
Miss.	1	*Abernethy, Thomas G.	Dem.	Okolona	N.D.	10	*Jonas, Charles Raper	Rep.	Lincolnton
	2	*Whitten, Jamie L.	Dem.	Charleston		11	Whitener, Basil L.	Dem.	Gastonia
	3	*Smith, Frank E.	Dem.	Greenwood		12	*Shuford, George A.	Dem.	Asheville
	4	*Williams, John Bell	Dem.	Raymond			*Burdick, Usher L.	Rep.	Williston
	5	*Winstead, Arthur	Dem.	Philadelphia			*Krueger, Otto	Rep.	Fessenden
	6	*Colmer, William M.	Dem.	Pascagoula					
Mo.	1	*Karsten, Frank M.	Dem.	St. Louis	Ohio	1	*Scherer, Gordon H.	Rep.	Cincinnati
	2	*Curtis, Thomas B.	Rep.	Webster Groves		2	*Hess, William E.	Rep.	Cincinnati
	3	*Sullivan, Mrs. John B. (Leonor)	Dem.	St. Louis		3	*Schenck, Paul F.	Rep.	Dayton
	4	*Christopher, George H.	Dem.	Butler		4	*McCulloch, William M.	Rep.	Piqua
	5	*Bolling, Richard	Dem.	Kansas City		5	*Clevenger, Cliff	Rep.	Bryan
	6	*Hull, W. R., Jr.	Dem.	Weston		6	*Polk, James G.	Dem.	Highland
	7	*Brown, Charles H.	Dem.	Springfield		7	*Brown, Clarence J.	Rep.	Blanchester
	8	*Carnahan, A. S. J.	Dem.	Ellsinore		8	*Betts, Jackson E.	Rep.	Findlay
	9	*Cannon, Clarence	Dem.	Elsberry		9	*Ashley, Thomas L.	Dem.	Waterville
	10	*Jones, Paul C.	Dem.	Kennett		10	*Jenkins, Thomas A.	Rep.	Ironton
	11	*Moulder, Morgan M.	Dem.	Camdenton		11	Dennison, David S., Jr.	Rep.	Warren
Mont.	1	*Metcalf, Lee	Dem.	Helena	Okla.	12	*Vorys, John M.	Rep.	Columbus
	2	Anderson, Le Roy H.	Dem.	Conrad		13	*Baumhart, A. D., Jr.	Rep.	Vermilion
Neb.	1	*Weaver, Phil	Rep.	Falls City		14	*Ayres, William H.	Rep.	Akron
	2	Cunningham, Glenn	Rep.	Omaha		15	*Henderson, John E.	Rep.	Cambridge
	3	*Harrison, Robert D.	Rep.	Norfolk		16	*Bow, Frank T.	Rep.	Canton (R.F.D.)
	4	*Miller, A. L.	Rep.	Kimball		17	*McGregor, J. Harry	Rep.	West Lafayette
Nev.	†Baring, Walter S.	Dem.	Reno	18		*Hays, Wayne L.	Dem.	Flushing	
N.H.	1	*Morrow, Chester E.	Rep.	Center Ossipee		19	*Kirwan, Michael J.	Dem.	Youngstown
	2	*Bass, Perkins	Rep.	Peterborough		20	*Feighan, Michael A.	Dem.	Cleveland
N.J.	1	*Wolverton, Charles A.	Rep.	Merchantville		21	*Vanik, Charles A.	Dem.	Cleveland
	2	(Vacancy) ¹				22	*Bolton, Frances P.	Rep.	Lyndhurst
	3	*Auchincloss, James C.	Rep.	Rumson	23	*Minshall, William E.	Rep.	Cleveland	
	4	*Thompson, Frank, Jr.	Dem.	Trenton	1	*Belcher, Page	Rep.	Enid	
	5	*Frelinghuysen, Peter, Jr.	Rep.	Morristown	2	*Edmondson, Ed	Dem.	Muskogee	
	6	Dwyer, Florence P.	Rep.	Elizabeth	3	*Albert, Carl	Dem.	McAlester	
	7	*Widnall, William B.	Rep.	Saddle River	4	*Steed, Tom	Dem.	Shawnee	
	8	*Canfield, Gordon	Rep.	Paterson	5	*Jarman, John	Dem.	Oklahoma City	
	9	*Osmers, Frank C., Jr.	Rep.	Tenafly	6	†Morris, Toby	Dem.	Lawton	
	10	*Rodino, Peter W., Jr.	Dem.	Newark	Ore.	1	*Norblad, Walter	Rep.	Stayton
	11	*Addonizio, Hugh J.	Dem.	Newark		2	Ullman, Al	Dem.	Baker
	12	*Kean, Robert W.	Rep.	Livingston		3	*Green, Edith	Dem.	Portland
	13	*Sieminski, Alfred D.	Dem.	Jersey City		4	Porter, Charles O.	Dem.	Eugene
	14	Dellay, Vincent J.	Rep.	West New York	Pa.	1	*Barrett, William A.	Dem.	Philadelphia
N.M.	(Vacancy) ²			2		Granahan, Mrs. William T. (Kathryn E.)	Dem.	Philadelphia	
	*Dempsey, John J.	Dem.	Santa Fe	3		*Byrne, James A.	Dem.	Philadelphia	
N.Y.	1	*Wainwright, Stuyvesant	Rep.	East Hampton		4	*Chudoff, Earl	Dem.	Philadelphia
	2	*Derounian, Steven B.	Rep.	Roslyn		5	*Green, William J., Jr.	Dem.	Philadelphia
	3	*Becker, Frank J.	Rep.	Lynbrook		6	*Scott, Hugh D., Jr.	Rep.	Philadelphia
	4	*Latham, Henry J.	Rep.	Queens Village		7	*James, Benjamin F.	Rep.	Rosemont
	5	*Bosch, Albert H.	Rep.	Richmond Hill		8	Curtin, Willard S.	Rep.	Morrisville
	6	*Holtzman, Lester	Dem.	Rego Park		9	*Dague, Paul B.	Rep.	Downingtown
	7	*Delaney, James J.	Dem.	Long Island City		10	*Carrigg, Joseph L.	Rep.	Susquehanna
	8	*Anfuso, Victor L.	Dem.	Brooklyn		11	*Flood, Daniel J.	Dem.	Wilkes-Barre
	9	*Keogh, Eugene J.	Dem.	Brooklyn	12	*Fenton, Ivor D.	Rep.	Mahanoy City	
	10	*Kelly, Edna F.	Dem.	Brooklyn	13	*McConnell, Samuel K., Jr.	Rep.	Wynnewood	
	11	*Celler, Emanuel	Dem.	Brooklyn	14	*Rhodes, George M.	Dem.	Reading	
	12	*Dom, Francis E.	Rep.	Brooklyn	15	*Walter, Francis E.	Dem.	Easton	
	13	*Multer, Abraham J.	Dem.	Brooklyn	16	*Mumma, Walter M.	Rep.	Harrisburg	
	14	*Rooney, John J.	Dem.	Brooklyn	17	*Bush, Alvin R.	Rep.	Muncy	
	15	*Ray, John H.	Rep.	Staten Island	18	*Simpson, Richard M.	Rep.	Huntingdon	
	16	*Powell, Adam Clayton, Jr.	Dem.	New York city	19	†Stauffer, S. Walter	Rep.	York	
	17	*Coudert, Frederic R., Jr.	Rep.	New York city	20	*Van Zandt, James E.	Rep.	Altoona	
	18	Santangelo, Alfred E.	Dem.	New York city	21	*Kelley, Augustine B.	Dem.	Greensburg	
	19	Farbstein, Leonard	Dem.	New York city	22	*Saylor, John P.	Rep.	Johnstown	
	20	Teller, Ludwig	Dem.	New York city	23	*Gavin, Leon H.	Rep.	Oil City	
	21	*Zelenko, Herbert	Dem.	New York city	24	*Kearns, Carroll D.	Rep.	Farrell	
	22	*Healey, James C.	Dem.	New York city	25	*Clark, Frank M.	Dem.	Bessemer	
	23	*Dollinger, Isidore	Dem.	New York city	26	*Morgan, Thomas E.	Dem.	Fredericktown	
	24	*Buckley, Charles A.	Dem.	New York city	27	*Fulton, James G.	Rep.	Pittsburgh	
	25	*Fino, Paul A.	Rep.	New York city	28	*Eberharter, Herman P.	Dem.	Pittsburgh	
	26	Dooley, Edwin B.	Rep.	Mamaroneck	29	*Corbett, Robert J.	Rep.	Pittsburgh	
	27	*Gwinn, Ralph W.	Rep.	Bronxville	30	Holland, Elmer J.	Dem.	Pittsburgh	
	28	*St. George, Katharine	Rep.	Tuxedo Park	R.I.	1	*Forand, Aime J.	Dem.	Cumberland
	29	*Wharton, J. Ernest	Rep.	Richmondville		2	*Fogarty, John E.	Dem.	Harmony
	30	*O'Brien, Leo W.	Dem.	Albany	S.C.	1	*Rivers, L. Mendel	Dem.	Charleston
	31	*Taylor, Dean P.	Rep.	Troy		2	*Riley, John J.	Dem.	Sumter
	32	*Kearney, Bernard W.	Rep.	Gloversville		3	*Dorn, W. J. Bryan	Dem.	Greenville
	33	*Kilburn, Clarence E.	Rep.	Malone		4	*Ashmore, Robert T.	Dem.	Greenville
	34	*Williams, William R.	Rep.	Cassville		5	Hemphill, Robert W.	Dem.	Chester
35	*Riehlman, R. Walter	Rep.	Tully	6		*McMillan, John L.	Dem.	Florence	
36	*Taber, John	Rep.	Auburn	S.D.	1	McGovern, George S.	Dem.	Mitchell	
37	*Cole, Sterling	Rep.	Bath		2	*Berry, E. Y.	Rep.	McLaughlin	
38	*Keating, Kenneth B.	Rep.	Rochester		Tenn.	1	*Reece, B. Carroll	Rep.	Johnson City
39	*Ostertag, Harold C.	Rep.	Attica			2	*Baker, Howard H.	Rep.	Huntsville
40	*Miller, William E.	Rep.	Lockport			3	*Frazier, James B., Jr.	Dem.	Chattanooga
41	*Radwan, Edmund P.	Rep.	Buffalo			4	*Evins, Joe L.	Dem.	Smithville
42	*Pillion, John R.	Rep.	Lackawanna	5		Loser, J. Carlton	Dem.	Nashville	
43	*Reed, Daniel A.	Rep.	Dunkirk	6		*Bass, Ross	Dem.	Pulaski	
				7		*Murray, Tom	Dem.	Jackson	
				8		*Cooper, Jere	Dem.	Dyersburg	
				9		*Davis, Clifford	Dem.	Memphis	

Institution and Location	Year Founded	Chief Executive	Full Time Students	Part Time Students	Faculty	Endowment	Bound Library Volumes
Atlanta University, Atlanta, Ga.	1867	Rufus E. Clement	127	578	48	\$6,658,352	138,000
Atlantic Christian College, Wilson, N.C.	1902	Travis A. White	585	705	41	454,055	21,000
Atlantic Union College, S. Lancaster, Mass.	1882	Lawrence M. Stump	391	415	30		40,000
Augsburg College and Theol. Seminary, Minneapolis, Minn.	1869	Bernhard Christensen	645	683	63	105,500	28,000
Augusta College, Augusta, Ga.	1925	A. P. Markert	162	162	15		15,000
Augustana College, Rock Island, Ill.	1860	Conrad Bergendoff	947	1,282	94	3,000,000	100,000
Augustana College, Sioux Falls, S.D.	1860	Lawrence M. Stavig	932	969	73	503,076	37,000
Aurora College, Aurora, Ill.	1893	T. P. Stephens	251	448	36	73,076	40,625
Austin College, Sherman, Tex.	1849	John D. Moseley	480	610	42	1,198,845	36,000
Austin Peay State Col., Clarksville, Tenn.	1927	Halbert Harvill	612	947	69		32,000
Averett College (Jr.), Danville, Va.	1859	Curtis V. Bishop	245	330	31	93,000	9,000
Babson Inst. of Bus. Adm., Babson Park, Mass.	1913	E. B. Hinckley	517	525	34	2,472,065	21,000
Bakersfield College (Jr.), Bakersfield, Calif.	1919	Ralph Prator	1,349	3,646	93		20,000
Baker University, Baldwin City, Kan.	1858	Nelson P. Horn	474	477	37	2,732,767	88,000
Baldwin-Wallace College, Berea, O.	1848	A. B. Bonds, Jr.	1,148	1,687	85	6,336,868	61,050
Ball State Teachers College, Muncie, Ind.	1918	John R. Enns	3,049	3,735	194		127,000
Ball State College, Lake Forest, Ill.	1863	Mother M. Burke	202	255	40	160,400	32,000
Barber-Scotia College, Concord, N.C.	1867	L. S. Cartwright	209	224	41	950,000	15,957
Barclay College, Amherst-on-Hudson, N.Y.	1860	James H. Case, Jr.	201	214	49	875,395	48,000
Barry College, Miami, Fla.	1880	Mother Mary Gerald	1,269	1,286	141	815,467.8	76,407
Bates College, Lewiston, Me.	1864	Charles F. Phillips	768	773	95	663,000	95,000
Bay City Junior College, Bay City, Mich.	1922	Eric J. Bradner	604	1,225	66		14,000
Beaumont College, Jenkintown, Pa.	1845	William R. White	354	360	60	100,000	34,000
Beaver College, Jackson, Miss.	1853	R. McFerran Crowe	184	200	30	300,000	23,492
Belmont College (Jr.), Plattsburgh, N.Y.	1872	William J. Gleason	338	383	33	334,645	25,759
Belmont Abbey College, Belmont, N.C.	1958	Walter A. Coggin	934	974	83	3,420,000	165,000
Belmont College, Beloit, Wis.	1865	R. Kelly White	748	748	50	1,552,960	32,071
Benedict College, Columbia, S.C.	1873	J. A. Bacot	428	428	32	435,262	25,262
Bennett College, Greensboro, N.C.	1880	Willie B. Player	213	213	50	200,000	14,000
Bennett Junior College, Millbrook, N.Y.	1931	Courtney Carroll	323	323	48	160,000	33,000
Bennington College, Bennington, Vt.	1832	F. H. Burkhardt	1,046	1,051	96	18,207,000	128,000
Berea College, Berea, Ky.	1855	Francis S. Huichins	494	535	47	3,305,918	50,000
Bethany College, Bethany, W. Va.	1840	Perry E. Gresham	324	308	35	560,594	30,000
Bethany College, Lindsborg, Kan.	1881	Robert Morviedt	683	740	40		32,000
Bethany Nazarene College, Bethany, Okla.	1899	Roy H. Cantrell	337	408	44	561,590	29,000
Bethel College, North Newton, Kan.	1887	D. C. Wedel	207	207	16	15,000	11,000
Bethune-Cookman Col., Daytona Beach, Fla.	1884	W. Edwin Richardson	397	540	35	600,000	32,500
Bethune College, McKenzie, Tenn.	1842	Roy N. Baker	700	779	41	165,000	30,300
Birmingham-Southern Col., Birmingham, Ala.	1856	Guy E. Snively	824	922	52	2,000,000	78,000
Bishop College, Marshall, Tex.	1881	Milton K. Curry, Jr.	521	531	44	1,500,000	24,000
Bishop's University, Lennoxville, Que., Can.	1843	A. R. Jewitt	318	323	25	2,119,866	30,000
Black Hills Teachers Col., Spearfish, S.D.	1883	Robert P. Ludlum	381	381	35		29,000
Blinn College (Jr.), Brenham, Tex.	1883	Russell E. Jonas	350	556	38		29,000
Bluefield State College, Bluefield, W. Va.	1920	Thomas M. Spencer	246	248	25	118,000	7,801
Blue Mountain College, Blue Mountain, Miss.	1895	Stephen J. Wright	226	241	25		22,000
Boise Junior College, Boise, Ida.	1932	Lawrence T. Lowrey	941	1,024	57	532,558	21,000
Boston College, Chestnut Hill, Mass.	1863	Eugene B. Chaffee	5,437	7,395	448	1,576,000	18,000
Bowdoin College, Brunswick, Me.	1839	Harold C. Case	963	1,767	157	8,351,792	44,515
Bowling Green St. Univ., Bowling Green, Ohio	1813	James S. Coles	3,710	775	228	12,615,537*	269,515
Bradford Junior College, Bradford, Mass.	1903	Ralph W. McDonald	346	371	28		150,000
Bradley University, Peoria, Ill.	1897	Dorothy M. Bell	301	305	31	301,465	23,000
Brandeis University, Waltham, Mass.	1947	Harold P. Rodas	2,267	3,288	157	2,675,056	100,000
Brandeis University, Waltham, Mass.	1899	J. R. C. Evans	195	587	28	1,305,000	82,000
Brenau College, Gainesville, Ga.	1878	Mother A. Martin	300	343	30	1,200,000	10,000
Brescia College (Jr.), Owensboro, Ky.	1934	Robert H. Stamey	159	488	22	559,390	16,000
Brevard College, Brevard, N.C.	1930	St. Jean Marie Kamm	219	270	32		28,000
Briarcliff College, Sioux City, Ia.	1932	Clara Teed	269	269	30		16,000
Briarcliff Junior Col., Briarcliff Manor, N.Y.	1932	James H. Halsey	1,600	3,300	150	450,000	62,000
Bridgeport Univ. of Bridgeport, Conn.	1927	Warren D. Bowman	442	455	36	591,935	21,000
Brigham Young College, Bridgewater, Va.	1880	Ernest L. Wilkinson	7,161	7,413	474	315,117	235,972
Brigham Young University, Provo, Utah	1875	N. A. M. MacKenzie	6,300	6,403	750	1,003,291	300,000
Brigham Young Univ. of Vancouver, B.C., Can.	1908	H. S. Rogers	1,858	5,626	481	2,409,000	43,000
Brooklyn Polytech. Inst. of, Brooklyn, N.Y.	1854						
Brooklyn College, Brooklyn, N.Y.	1930	Harry D. Gidense	8,006	23,368	1,027	\$41,407	255,000
Bryn Mawr College, Bryn Mawr, Pa.	1864	Barnaby C. Keeney	3,304	3,411	516	22,349,996	838,000
Bucknell University, Lewisburg, Pa.	1846	Katharine E. McBride	738	803	125	10,212,698*	250,000
Buena Vista College, Storm Lake, Ia.	1891	Merle M. Odgers	1,900	1,940	147	3,309,259	143,888
Bufo College, Buffalo, N.Y.	1846	John A. Fisher	430	520	36	208,826	310,933
Burlington College (Jr.), Burlington, Ia.	1846	Clifford C. Furnas	4,836	9,561	1,313	9,292,668*	310,933
Butler University, Indianapolis, Ind.	1850	D. D. Stonehocker	230	651	29		7,000
Butler University, Indianapolis, Ind.	1850	M. O. Ross	2,513	4,489	205	6,623,771	176,000
Caldwell Col. for Women, Caldwell, N.J.	1939	Sister M. Inez	220	220	37		22,000
California Univ. of, Berkeley, Los Angeles, Santa Barbara, San Francisco, Davis, Mount Hamilton, La Jolla and Riverside, Calif.	1868	Robert G. Sproul	37,066		5,290	79,447,463	3,632,261
California Col. of Arts and Crafts, Oakland, Calif.	1907	D. S. Defenbacher	284	658	45	15,000	7,000
California Inst. of Tech., Pasadena, Calif.	1891	Lee A. DuBridge	982	982	360	31,865,000	100,000
California Sch. of Fine Arts, San Francisco, Calif.	1874	Gordon Woods	95	267	24	235,000	10,000
California State Polytechnic Col., San Luis Obispo, Calif.	1901	Julian A. McPhee	3,027	3,093	208		60,000
Calvin College, Grand Rapids, Mich.	1876	William Spoelhof	1,433	1,433	67	250,000	64,000
Campbell College (Jr.), Buie's Creek, N.C.	1887	Leslie H. Campbell	653	656	95	177,562	12,000
Campbellsville Col. (Jr.), Campbellsville, Ky.	1906	John M. Carrier	318	357	25	100,000	9,050
Canal Zone Jr. Col., Balboa Heights, C.Z.	1933	Roger C. Hackett	144	409	25		12,000
Canisius Junior College, Phipps Passes, Ky.	1923	Alice S. G. Lloyd	130	130	11	225,000	30,000
Capital University, Columbus, O.	1820	Philip E. Dobson	1,142	1,853	101	786,000	75,000
Cardinal College (Jr.), Price, Utah	1850	Harold L. Yachum	1,137	1,173	96		7,000
Cardinal Stritch College, Milwaukee, Wis.	1937	Sr. Mary A. Miller	137	362	35	6,237,000	152,000
Carleton College, Northfield, Minn.	1866	Laurence M. Gould	894	895	95	244,282	40,000
Carnegie Institute of Tech. (incl. Margaret Morrison Carnegie Col.), Pittsburgh, Pa.	1942	Claude T. Bissell	495	1,313	94		138,000
Carroll College, Helena, Mont.	1909	John C. Warner	3,040	4,192	375	30,000,000	22,800
Carroll College, Waukesha, Wis.	1909	R. V. Kavanagh	507	527	58	730,000	22,800
Carson-Newman Col., Jefferson City, Tenn.	1851	Robert D. Steele	614	643	48	1,579,375	37,000
Carthage College, Carthage, Ill.	1870	D. Harley Fite	1,107	1,081	54	771,081	46,000
Cascade College, Portland, Ore.	1918	Harold H. Lentz	423	536	45	832,299	50,000
Case Inst. of Technology, Cleveland, O.	1880	C. J. Pike	1,633	215	21	65,000	15,000
Catholic Univ. of America, Washington, D.C.	1863	Alvin R. Keppel	1,921	1,921	190	8,600,000	62,000
Catholic Univ. of Puerto Rico, Ponce, P.R.	1887	Bryan J. McManus	2,287	3,354	408	6,890,038*	500,000
Cedar Crest College, Allentown, Pa.	1867	Joe J. Moore	412	422	42	345,770	31,000
Centenary College of La., Shreveport, La.	1825	Dale H. Mickle	704	1,635	110	3,400,000	41,500
Centenary Junior Col., Hackettsville, N.J.	1855	Edward W. Seay	434	454	45	2,382,365	19,000
Central College, Fayette, Mo.	1855	Ralph L. Woodward	553	579	42	1,221,367	59,022
Central College, Ia.	1853	F. C. Kintner	391	396	41	897,509	32,000
Central Junior College, Centralia, Wash.	1925		266	416	24		4,000
Central Michigan College of Education, Mt. Pleasant, Mich.	1892	Charles L. Anspach	2,492	4,174	224		101,372
Central Missouri St. Col., Warrensburg, Mo.	1870	G. W. Diemer	1,805	1,989	106		87,600
Central State College, Edmond, Okla.	1890	W. Max Chambers	1,558	1,837	92	57,000	57,000
Central State College, Wilkesboro, N.C.	1887	Charles H. Wesley	1,084	1,124	86	30,000	30,000
Central Wash. Col. of Ed., Ellensburg, Wash.	1891	Robert E. McConnell	1,357	1,385	111	60,000	60,000
Centre College of Kentucky, Danville, Ky.	1819	Walter A. Groves	404	416	99	2,581,000	47,000
Chaffey College (Jr.), Ontario, Calif.	1883	Daniel B. Milliken	766	1,734	95		47,000
Chapman College, Orange, Calif.	1861	George N. Reeves	317	437	30	1,789,685	30,000
Charleston College of Charleston, S.C.	1785	George D. Grice	246	259	17	850,000	36,232
Chatham College, Pittsburgh, Pa.	1869	Paul R. Anderson	422	427	49	2,382,365	49,000
Chattanooga Univ. of Chattanooga, Tenn.	1886	David A. Lockmiller	753	1,265	124	2,588,176	61,000
Chestnut Hill College, Philadelphia, Pa.	1871	Sister C. Frances	426	583	50	167,000	44,000
Chicago Sch. of the Art, Chicago, Ill.	1879	C. Hubert Ropp	725	2,087	73	1,237,514	74,000
Chicago University of Chicago, Ill.	1890	Lawrence A. Kimpton	3,495	6,606	776	84,985,660	1,911,111
Chicago City Junior College, Chicago, Ill.	1934	Peter Masiko, Jr.	671	1,251	131		18,000
Chicago Teachers College, Chicago, Ill.	1934	J. M. McCullister	1,664	4,201	59		65,000
Chico State College, Chico, Calif.	1869	Peter Masiko, Jr.	2,719	7,185	293		52,000
Chico State College, Chico, Calif.	1869	Glenn Kendall	2,332	3,760	163		65,000
Chouinard Art Inst., Los Angeles, Calif.	1920	Mrs. N. M. Chouinard	1,849	2,181	129		67,503
Christian Brothers Col. (Jr.), Memphis, Tenn.	1871	Bro. Lambert Thomas	249	688	42		1,553
Christian College (Jr.), Columbia, Mo.	1851	James C. Miller	290	300	31	8,127	16,000
			345	345	48	112,000	16,824

Institution and Location	Year Founded	Chief Executive	Full Time Students	Part Time Students	Faculty	Endowment	Bound Library Volumes
John Carroll University, Cleveland, O.	1863	F. E. Welfle	2,000	3,200	161	\$3,500,000	75,000
Johns Hopkins University, Baltimore, Md.	1876	Milton S. Eisenhower	2,064	6,411	1,381	46,113,127	1,068,363
Johnson C. Smith Univ., Charlotte, N.C.	1867	Hardy Liston	575	620	43	2,060,000	35,000
Joliet Junior College, Joliet, Ill.	1901	Hugh S. Bonar	463	506	71	—	12,000
Jones County Junior Coll., Ellisville, Miss.	1927	James B. Young	548	595	48	—	17,000
Judson College, Joplin, Mo.	1938	Roi S. Wood	353	456	32	643,261	10,800
Judson College, Marion, Ala.	1838	John Ingle Riddle	249	262	28	—	20,000
Juniata College, Huntingdon, Pa.	1876	Calvert N. Ellis	601	647	44	1,060,530	66,000
K							
Kalamazoo College, Kalamazoo, Mich.	1833	Weimer K. Hicks	473	479	51	3,074,651	60,000
Kansas State Univ. of Lawrence, Kan.	1865	Franklin D. Murphy	6,797	7,661	1,170	8,310,000	700,000
Kansas City, Jr. Col. of Kansas City, Mo.	1915	Miles G. Blim	980	2,480	980	—	35,000
Kansas City, Univ. of Kansas City, Mo.	1929	Earl J. McGrath	1,548	3,188	230	1,081,146	168,000
Kansas City Jr. Col., Kansas City, Kan.	1923	C. W. Harvey	449	460	20	—	8,178
Kansas State Col. of Agri. and App. Sci., Manhattan, Kan.	1863	James A. McCain	5,405	5,675	1,007	850,000	193,000
Kansas State Tech. Col., Emporia, Kan.	1863	John E. King	1,795	2,059	141	—	106,000
Kansas State Univ., Pittsburg, Kan.	1903	Rees H. Hughes	1,895	2,254	189	68,000	100,000
Kennebec College, Kennebec, Me.	1909	Lloyd P. Young	598	604	39	—	24,500
Kenner Military School (Jr.), Boonville, Mo.	1844	Frederick Marston	300	300	23	210,000	9,000
Kent State University, Kent, O.	1910	Herman L. Donovan	5,100	5,800	301	201,617	720,000
Kentucky State College, Lexington, Ky.	1865	Rufus B. Alwood	425	432	43	436,700	25,000
Kentucky State College, Frankfort, Ky.	1866	Rufus B. Alwood	375	564	33	3,287,755	140,000
Kentucky Wesleyan College, Owensboro, Ky.	1824	Gordon K. Chalmers	506	507	53	316,522	46,000
Kenyon College, Gambier, O.	1868	Katherine G. Bleyer	313	313	40	325,000	12,000
Keuka College, Keuka Park, N.Y.	1892	Blake Tewksbury	222	225	21	—	16,000
KeyStone Junior College, La Plume, Pa.	1935	Cruce Stark	890	1,325	73	—	18,000
Kilgore College (Jr.), Kilgore, Tex.	1879	R. T. Linton	202	210	26	1,250,000	36,000
King College, Bristol, Tenn.	1789	H. L. Puxley	109	127	14	470,303	30,000
King's College, Halifax, N.S., Can.	1789	George P. Banaglia	729	789	51	200,000	30,000
King's College, Wilkes-Barre, Pa.	1946	Sherry C. Unbeck	743	751	76	418,655*	84,000
Knox College, Galesburg, Ill.	1837	James A. Colston	441	468	39	549,886	15,000
Knoxville College, Knoxville, Tenn.	1875						
L							
Lafayette College, Easton, Pa.	1826	Ralph C. Hutchison	1,478	1,603	166	6,274,836	150,000
La Grange College, La Grange, Ga.	1831	Wrights G. Henry, Jr.	312	243	26	1,850,000	17,000
Lake Erie College, Painesville, O.	1856	Paul Weaver	320	373	37	900,000	43,000
Lake Forest College, Lake Forest, Ill.	1857	Ernest A. Johnson	636	678	52	1,900,000	72,000
Lamar State Coll. of Tech., Beaumont, Tex.	1923	F. L. McDonald	2,403	4,823	199	35,754	31,248
Lambuth College, Jackson, Tenn.	1924	L. L. Gabel	300	318	28	383,305	20,646
Lander College, Greenwood, S.C.	1872	B. M. Grier	305	309	27	250,000	11,000
Lane College, Jackson, Tenn.	1882	C. A. Kirkendall	370	440	25	164,975	76,000
Langston University, Langston, Okla.	1897	G. L. Harrison	560	606	56	—	40,000
La Salle College, Philadelphia, Pa.	1863	Bro. E. Stanislaus	2,332	3,152	176	—	14,000
La Salle-Peru-Oglesby Jr. Col., LeSalle, Ill.	1924	Francis H. Dolan	275	281	35	75,000	15,000
LeSalle Junior College, Auburndale, Mass.	1851	Raymond C. Wass	600	600	54	—	39,500
Le Sierra College, Arlington, Calif.	1922	Narval F. Pease	674	927	64	—	3,000
Lessem Junior College, Susanville, Calif.	1925	A. M. Karasek	180	190	15	—	339,210
Leval University, Quebec, Que., Can.	1852	Carl F. Parent	7,557	10,486	1,338	5,000,000	24,000
La Verne College, La Verne, Calif.	1891	Harold D. Fasnacht	258	414	44	219,000	74,000
Lawrence College, Appleton, Wis.	1847	Douglas M. Knight	766	782	81	2,541,423	59,000
Lebanon Valley College, Anville, Pa.	1866	Frederic K. Miller	549	834	50	893,095	16,000
Lee College, Baytown, Tex.	1934	George H. Gentry	339	869	41	138,816	6,000
Lee Junior College, Jackson, Ky.	1883	R. G. Landolt	133	147	11	373,000	13,000
Lees-McCoe Col. (Jr.), Banner Elk, N.C.	1900	Fletcher Nelson	305	305	19	12,462,111	356,000
Lehigh University, Bethlehem, Pa.	1865	Martin D. Whitaker	2,614	3,094	321	12,462,111	356,000
Le Moyne College, Memphis, Tenn.	1870	Hollis F. Price	329	414	25	—	23,000
Le Roy College, Syracuse, N.Y.	1946	Robert F. Grewen	1,038	1,083	80	123,772	28,000
Lenoir Rhyme College, Hickory, N.C.	1891	Volat R. Gomer	865	877	48	850,000	38,000
Lewis and Clark College, Portland, Ore.	1909	Trentwell M. White	332	415	24	100,000	23,600
Lincoln College, Gaffney, S.C.	1867	Morgan S. Odell	983	1,005	88	472,122*	44,000
Lincoln College (Jr.), Lincoln, Ill.	1845	A. J. Eastwood	269	272	27	814,000	27,103
Lincoln Memorial Univ., Harrogate, Tenn.	1866	Raymond Dooley	163	241	25	1,300,000	16,000
Lincoln University, Jefferson City, Mo.	1866	Robert L. Kincaid	419	489	32	1,245,613	35,000
Lindenwood College, St. Charles, Mo.	1827	Horace M. Bond	286	290	37	1,269,344	70,000
Lindenwood College, St. Charles, Mo.	1827	Francis L. McCluer	346	346	45	2,974,427	36,000
Lindfield College, McMinnville, Ore.	1904	John B. Horton	145	175	13	41,227	11,000
Little Rock Junior College, Little Rock, Ark.	1927	Harry L. Dillin	449	665	56	1,500,000	50,000
Livingstone College, Salisbury, N.C.	1879	E. Q. Brothers	449	813	39	2,500,000	23,000
Long Beach City Col. (Jr.), Long Beach, Calif.	1927	William J. Trent, Sr.	3,406	19,269	237	300,000	61,420
M							
Macalester College, St. Paul, Minn.	1885	Charles J. Turck	1,367	1,465	116	4,700,000	69,000
McClintock University, Montreal, Que., Can.	1821	F. Cyril James	6,477	6,918	130	41,107,032	720,000
McGill University, Montreal, Que., Can.	1827	George P. Gilmour	1,069	1,089	130	1,957,310*	93,040
MacMurray College for Women, Jacksonville, Ill.	1846	Louis W. Norris	437	510	44	4,992,766*	60,280
McMurry College, Abilene, Tex.	1922	Harold G. Cooke	539	734	42	973,709	33,000
McNeese State College, Lake Charles, La.	1939	Wayne N. Cusic	1,165	1,648	84	—	22,000
McPherson College, McPherson, Kan.	1887	D. W. Bithinger	395	460	37	537,539	19,000
Madison College, Harrisburg, Pa.	1908	G. Tyler Miller	971	1,053	94	—	80,000
Maine University of Orono, Me.	1865	Arthur A. Huck	3,497	4,641	350	1,947,000	268,000
Manchester College, N. Manchester, Ind.	1889	Vernon F. Schwalm	807	897	72	670,151	44,000
Manhattanville College of the Sacred Heart, Purchase, N.Y.	1849	Br. Augustine Philip	2,776	2,776	202	200,000	62,175
Manitoba, Univ. of Winnipeg, Man., Can.	1841	Eleanor M. O'Byrne	533	567	91	400,900	96,000
Marian College, Indianapolis, Ind.	1877	Francis J. Reine	422	470	346	1,270,882	206,000
Marietta College, Marietta, O.	1835	W. Bay Irvine	332	360	33	50,866	26,000
Marion College of (Jr.), Kentfield, Calif.	1926	Robert C. Provine	784	852	62	1,745,855	140,694
Marshall College, Huntington, W. Va.	1837	Stewart H. Smith	597	857	44	—	19,530
Mars Hill College (Jr.), Mars Hill, N.C.	1856	John Fort Fowler	312	312	25	6,205,000*	200,000
Mary Baldwin College, Staunton, Va.	1842	Charles W. McKenzie	2,304	3,105	180	500,000	99,000
Marygrove College, Detroit, Mich.	1846	Marygrove College, Detroit, Mich.	1,038	1,038	52	28,000	28,000
Mary Hardin-Baylor College, Belton, Tex.	1845	Sister M. Honora	294	278	33	187,306	3,000
Maryknoll Teachers Col., Maryknoll, N.Y.	1934	William P. North	676	729	99	661,119	45,000
Maryland State Col., College Park, Md.	1886	John Taylor Williams	429	429	45	118,357	74,000
Maryland State Tch. Col., Bowie, Md.	1899	R. Bowen Hardesty	520	540	31	2,095,801	35,137
Maryland State Tch. Col., Salisbury, Md.	1895	Earle T. Hawkins	1,127	1,180	87	—	27,000
Maryland State Tch. Col., Towson, Md.	1865	Sister John Baptist	369	396	51	3,989,234	299,643
Maryhurst College, Maryhurst, Ore.	1922	Mother Mary Helena	312	455	39	—	22,000
Marymount College, Sallina, Kan.	1907	Coeur Smith	986	986	105	276,267	45,212

Institution and Location	Year Founded	Chief Executive	Full Time Students	Part Time Students	Faculty	Endowment	Bound Library Volumes
Maryville College, Maryville, Tenn. . . .	1819	Ralph Waldo Lloyd	660	664	59	\$ 2,292,601	59,000
Maryville College, St. Louis, Mo. . . .	1872	Mother Odeide Mouton	300	315	38	295,000	33,000
Mary Washington College of the Univ. of Virginia, Fredericksburg, Va. . . .	1908	C. W. Darden, Jr.	1,548	1,548	90	89,822	113,000
Marywood College, Scranton, Pa. . . .	1915	Sister M. Eugenia	717	907	83	12,721	48,080
Mason City Junior Col., Mason City, Ia. . .	1918	Lawrence Shepsher	365	615	35	—	8,000
Massachusetts Univ. of Amherst, Mass. . .	1863	James Paul Mather	3,286	3,534	333	400,000	197,481
Mass. Inst. of Tech., Cambridge, Mass. . .	1861	Johns Killian, Jr.	5,648	—	957	68,787,904	550,000
Mass. School of Art, Boston, Mass. . . .	1873	Gordon L. Reynolds	125	125	29	—	8,000
Mass. State Tch. Col., Boston, Mass. . . .	1852	William F. Looney	886	1,453	58	—	32,000
Mass. State Tch. Col., Bridgewater, Mass. .	1853	C. C. Maxwell	746	746	62	—	30,000
Mass. State Tch. Col., Fitchburg, Mass. . .	1834	Ralph F. Weston	514	522	62	—	27,000
Mass. State Tch. Col., Framingham, Mass. .	1839	Martin F. O'Connor	600	678	40	—	23,000
Mass. State Tch. Col., Lowell, Mass. . . .	1894	Daniel H. O'Leary	438	440	49	—	16,000
Mass. State Tch. Col., N. Adams, Mass. . .	1894	Eugene L. Freal	155	155	23	—	14,000
Mass. State Tch. Col., Salem, Mass. . . .	1854	Frederick A. Meier	677	685	45	—	26,000
Mass. State Tch. Col., Worcester, Mass. . .	1871	Eugene A. Sullivan	520	520	31	—	20,000
Medical Evangelists, Col. of Loma Linda and Los Angeles, Calif. . . .	1909	G. T. Anderson	706	706	144	—	82,000
Memorial University of Newfoundland, St. John's, Nfld., Can. . . .	1925	Raymond Gushue	576	685	47	—	35,000
Memphis State College, Memphis, Tenn. .	1909	J. Millard Smith	2,930	3,350	195	—	76,000
Menlo College, Menlo Park, Calif. . . .	1927	William E. Kraft	600	600	50	—	17,000
Mercer University, Macon, Ga. . . .	1833	George B. Connell	1,094	1,355	80	4,000,000	96,000
Mercy College, Detroit, Mich. . . .	1934	Sister Mary Lucille	434	512	38	—	22,621
Mercyhurst College, Erie, Pa. . . .	1926	Mother M. Eustace	254	287	58	—	22,000
Meredith College, Raleigh, N.C. . . .	1891	Carlyle Campbell	551	578	47	615,144	38,000
Meridian Municipal Jr. Col., Meridian, Miss.	1937	J. O. Carson	1,009	1,169	65	—	16,500
Merrimack College, N. Andover, Mass. . .	1947	Vincent A. McQuade	641	1,014	52	162,000	19,000
Miami University of N. Andover, Mass. . .	1925	Jay F. W. Pearson	7,374	11,077	998	2,015,638	40,582
Miami University of N. Andover, Mass. . .	1909	John D. Millett	4,633	4,961	379	305,000	305,000
Miami University, Oxford, O. . . .	1817	Harlan Hatcher	20,024	23,085	1,833	23,384,590*	2,325,000
Michigan College of Mining and Technology, Houghton, Mich. . . .	1885	Grover C. Dillman	2,215	2,255	15	—	65,000
Michigan State Univ., Lansing, Mich. . . .	1855	John A. Hannah	17,176	17,890	1,254	3,021,795	765,604*
Middlebury College, Middlebury, Vt. . . .	1800	Samuel S. Stratton	1,230	1,230	84	8,504,124	126,220
Middle Georgia Col. (Jr.), Cochran, Ga. . .	1928	Lucien E. Roberts	305	318	19	—	13,000
Middle Tenn. St. Col., Murfreesboro, Tenn. .	1897	Quintin M. Smith	1,447	1,876	92	—	30,000
Middle College, Fremont, Neb. . . .	1909	Paul W. Dieckman	373	387	39	205,854	50,000
Midway Junior College, Midway, Ky. . . .	1847	Lewis A. Piper	96	98	10	1,589,000	8,564
Midwestern University, Wichita Falls, Tex. .	1922	D. L. Ligon	1,089	1,456	95	400,000	40,000
Miles College, Birmingham, Ala. . . .	1907	W. A. Bell	567	612	52	3,063,372	16,600
Millikin University, Decatur, Ill. . . .	1901	C. L. Miller	877	992	83	1,363,484	36,000
Millville College, Jackson, Miss. . . .	1891	H. E. Finger, Jr.	753	782	48	3,450,795*	111,646
Mississippi College, Oxford, Miss. . . .	1852	Lynn T. White, Jr.	454	525	68	2,524,600	64,750
Mississippi College, Oxford, Miss. . . .	1851	John B. Johnson, Jr.	1,501	1,559	37	53,741,947	179,047
Mississippi College, Oxford, Miss. . . .	1851	James Lewis Morrill	21,001	31,728	1,589	—	35,000
Minnesota Univ. of Minneapolis, Minn. . .	1913	C. R. Safford	612	694	54	—	34,000
Minn. State Tch. Col., Bemidji, Minn. . .	1867	C. L. Crawford	2,052	3,129	135	—	54,000
Minn. State Tch. Col., Mankato, Minn. . .	1867	A. L. Knoblach	749	1,169	82	—	27,000*
Minn. State Tch. Col., Moorhead, Minn. . .	1887	George F. Budd	1,947	1,947	113	—	85,000
Minn. State Tch. Col., St. Cloud, Minn. . .	1869	Nels Minné	772	822	58	—	41,447
Minn. State Tch. Col., Winona, Minn. . . .	1858	Sister Mary Gonzaga	770	822	78	1,100,000	30,200
Mississippi College, Oxford, Miss. . . .	1924	John D. Williams	2,613	2,677	71	861,490	255,000
Mississippi College, Oxford, Miss. . . .	1848	D. M. Nelson	1,430	1,522	210	1,117,608	53,000
Mississippi College, Oxford, Miss. . . .	1826	William D. McCain	2,697	3,232	197	—	72,000
Mississippi State Col., Hattiesburg, Miss. .	1910	Ben F. Hilburn	3,043	3,365	232	249,539	178,000
Mississippi State Col., State College, Miss. .	1878	Charles P. Hogarth	1,020	1,020	83	—	98,000
Mississippi St. Col. for Women, Columbus, Miss. . . .	1884	Elmer Ellis	9,960	10,389	903	3,130,500	831,000
Missouri University of Columbia, Mo. . .	1839	M. Earle Collins	347	357	33	625,000	35,000
Missouri Valley College, Marshall, Mo. . .	1888	John Montgomery	160	223	12	40,000	8,000
Mitchell College, Statesville, N.C. . . .	1852	H. C. Trenholm	320	320	13	—	4,572
*Mobile Branch, Alabama State College for Negroes, Mobile, Ala. . . .	1936	Robert W. Gibson	1,451	1,815	108	—	28,000
Modesto Junior College, Modesto, Calif. . .	1921	George T. Gilluly	66	66	26	—	4,261
Monmouth Community College (Jr.), Monmouth, Ill. . . .	1946	Robert W. Gibson	601	613	49	2,092,363	68,000
Monmouth College, Monmouth, Ill. . . .	1853	Edward Schlofer	275	296	34	—	8,000
Monmouth Jr. Col., W. Long Butte, N.J. . .	1933	J. Robert Van Pelt	274	296	36	600,000	23,000
Montana School of Mines, Butte, Mont. . .	1893	Roland R. Renne	2,422	2,550	249	2,573,867	120,000
Montana State College, Bozeman, Mont. . .	1893	Carl McFarland	2,531	2,686	259	911,868	393,178
Montana State University, Missoula, Mont. .	1893	Calvin C. Flint	755	1,525	44	—	12,000
Monterey Peninsula College (Jr.), Monterey, Calif. . . .	1947	Donald E. Deyo	379	591	54	—	8,000
Montgomery Jr. Col., Takoma Park, Md. . .	1936	Russell T. Sharpe	234	234	32	121,712	25,000
Monticello College, Godfrey, Ill. . . .	1835	—	—	—	—	—	—
Montreal, Univ. of, Montreal, Que., Can. .	1876	Irénée Lusier	10,362	13,959	1,878	\$ 558,182	175,000
Morehead State College, Morehead, Pa. . .	1807	Raymond S. Haupt	656	667	57	1,200,000	63,000
Morehead State College, Morehead, Pa. . .	1923	Adrian Doran	807	1,120	70	—	51,550
Morehouse College, Atlanta, Ga. . . .	1867	Benjamin E. Mays	627	627	41	2,086,311	138,000
Morgan State College, Baltimore, Md. . .	1867	Morrin D. Jenkins	2,144	2,293	148	—	65,000
Morningside College, Sioux City, Ia. . . .	1889	Earl A. Roadman	785	812	44	1,027,723	67,000
Morris Brown College, Atlanta, Ga. . . .	1881	John H. Lewis	591	743	55	650,888	12,000
Morris Brown Normal and Ind. College (Jr.), Morristown, Tenn. . . .	1881	H. L. Dickson	300	300	17	82,000	12,000
Morristown Junior College, Cicero, Ill. . . .	1924	Allen R. Moore	390	598	56	—	14,000
Mt. Allison Univ., Sackville, N.B., Can. . .	1840	W. T. R. Fleming	914	1,123	59	680,311	70,000
Mt. Aloysius Junior College, Cresson, Pa. . .	1939	Sr. Mary Magdalene	101	113	22	—	10,000
Mt. Angel Seminary, St. Benedict, Ore. . . .	1889	Damian Jennings	114	114	20	—	40,000
Mt. Angel Women's Col., Mt. Angel, Ore. . .	1887	Mother M. Gemma	41	65	13	—	10,000
Mt. Holyoke College, St. Hadley, Mass. . . .	1837	Roswell G. Ham	1,237	1,237	142	8,545,000	240,000
Mt. Holyoke College, Milwaukee, Wis. . . .	1872	Sr. M. John Francis	686	956	99	66,000	50,000
Mt. Mercy College, Pittsburgh, Pa. . . .	1923	Sr. Muriel Gallagher	381	394	55	—	34,000
Mt. Mercy Jr. College, Cedar Rapids, Ia. . .	1926	Sr. Mary Idephonse	201	243	36	—	19,000
Mt. St. Agnes College, Baltimore, Md. . . .	1867	Sr. Mary Cleophas	241	241	31	—	26,000
Mt. St. Clare College (Jr.), Clinton, Ia. . .	1918	Mother M. Regis Cleary	132	157	17	—	13,499
Mt. St. Joseph, O. . . .	1854	Sr. Maria Corona	494	533	52	798,650	41,000
Mt. St. Joseph Teachers Col., Buffalo, N.Y. .	1937	Sr. M. Hubert	239	289	30	—	30,000
Mt. St. Mary's College, Hooksett, N.H. . .	1934	Sr. M. Mauritia	132	132	24	—	18,000
Mt. St. Mary's College, Emmitsburg, Mo. . .	1808	John L. Sheridan	520	520	42	287,000	62,000
Mt. St. Mary's College, Emmitsburg, Mo. . .	1925	Sister Rosemary	519	572	63	—	43,000
Mt. St. Scholastica College, Atchison, Kan. .	1863	Mother Alfred Schroll	369	428	40	252,260	34,285
Mt. St. Vincent College, New York, N.Y. . .	1910	Sr. Catharine Marie	529	537	62	—	28,000
Mt. St. Vincent Col., Halifax, N.S., Can. . .	1873	Sr. Francis d'Assisi	257	370	28	—	48,400
Mt. Union College, Alliance, O. . . .	1846	George H. Bell	1,485	3,520	154	1,800,000	93,000
Mt. Union College, Alliance, O. . . .	1846	Carl E. Bracy	750	1,050	52	1,253,348	92,500
Muhlenberg College, Allentown, Pa. . . .	1846	Jr. Conrad Seegers	782	870	53	—	12,500
Mundelein College, Chicago, Ill. . . .	1897	John S. Griffith	856	834	71	2,352	39,000
Murray State College, Murray, Ky. . . .	1929	Sr. M. John Michael	835	879	68	—	56,000
Muskegon Community Col. (Jr.), Muskegon, Mich. . . .	1922	Ralph H. Woods	1,613	1,844	103	—	—
Muskegon College, New Concord, O. . . .	1926	Allen G. Umbreit	399	570	29	—	133,000
Muskegon College, New Concord, O. . . .	1837	R. N. Montgomery	865	900	63	1,105,683	50,576
Napa College (Jr.), Napa, Calif. . . .	1942	Roy L. Patrick	1,277	1,277	80	—	9,000
National College of Educ., Evanston, Ill. . .	1886	K. Richard Johnson	388	484	45	228,000	38,000
Navarro Junior College, Corsicana, Tex. . .	1946	Ben W. Jones	405	455	26	—	5,000
Nazareth College, Louisville, Ky. . . .	1920	Sr. Margaret Murphy	306	803	70	15,000	34,000
Nazareth Col. and Acad., Nazareth, Ky. . .	1814	Sr. Margaret Gertrude	296	296	33	—	18,000
Nazareth College, Nazareth, Mich. . . .	1897	Sr. Marie Kathleen	324	369	45	—	27,000
Nazareth College, Rochester, N.Y. . . .	1924	Mother M. Helene	475	567	61	1,412,628	53,528
Nebraska University of Lincoln, Neb. . . .	1869	Clifford M. Hardin	7,515	7,620	689	—	34,000
Nebraska State Tch. Col., Chadron, Neb. . .	1911	Barton L. Kline	437	447	62	—	29,627
Nebraska State Tch. Col., Kearney, Neb. . .	1905	Herbert L. Cushing	1,072	1,108	62	—	44,000
Nebraska State Tch. Col., Peru, Neb. . . .	1867	Near S. Goman	423	482	49	—	56,000
Nebraska State Tch. Col., Wayne, Neb. . .	1888	M. J. Hassel	870	888	74	—	50,000
Nevada Wesleyan Univ., Lincoln, Neb. . . .	1887	A. Leland Forrest	756	812	59	1,336,492	40,562
Nevada University of Reno, Nev. . . .	1874	Minard W. Stout	1,371	2,161	155	998,023	113,000
Newark College of Engineering, Newark, N.J. .	1951	James R. Dickinson	59	361	30	—	5,000
New Brunswick College, Newberry, S.C. . .	1881	R. W. Van Houten	1,312	4,256	464	78,009	28,000
New Brunswick College, Newberry, S.C. . .	1856	C. A. Kaufmann	454	467	30	315,000	27,000
New Brunswick University of Fredericton, N.B., Can. . . .	1785	Colin B. Mackay	1,022	1,022	76	1,700,000	120,000
New Church, Acad. of the Bryn Athyn, Pa. . .	1886	George de Charms	80	87	18	57,388,514	61,000
Newcomb College, New Orleans, La. . . .	1886	John R. Hubbard	769	775	70	2,248,684	40,000
New England Con. of Music, Boston, Mass. .	1867	Harrison Keller	420	1,205	127	2,000,000	9,000
New Hampshire Univ. of Durham, N.H. . .	1866	Eldon L. Johnson	3,027	3,159	266	2,574,135	225,571
New Haven St. Col., New Haven, Conn. . .	1920	Marvin K. Peterson	36	614	72	—	5,000
New Jersey State Tch. Col., Glassboro, N.J. .	1919	Thomas E. Robinson	510	1,478	46	—	30,000
New Jersey State Tch. Col., Jersey City, N.J. .	1927	M. B. Gilligan	528	748	42	—	40,000
New Jersey State Tch. Col., Newark, N.J. . .	1855	Eugene G. Wilkins	669	2,002	62	—	41,075
New Jersey State Tch. Col., Paterson, N.J. . .	1855	Marion E. Shea	689	1,375	47	—	25,000
New Jersey State Tch. Col., Trenton, N.J. . .	1855	Roscoe L. West	893	1,509	84	—	75,000
New Jersey St. Col., Upper Montclair, N.J. .	1888	Thomas L. Partridge	1,177	1,797	99	51,200	72,000
New Mexico Col. of Agri. and Mech. Arts, New Mexico, N.M. . . .	1889	Thomas L. Popejoy	31,60	4,629	271	1,900,000	255,000
New Mexico Highlands Univ., Las Vegas, N.M. .	1888	Roger B. Corbally	21,50	2,809	145	1,047,598	94,000
New Mexico Highlands Univ., Las Vegas, N.M. .	1893	Thomas C. Donnelly	687	755	56	—	62,000

Institution and Location	Year Founded	Chief Executive	Full Time Students	Part Time Students	Faculty	Endowment	Bound Library Volumes
Pasadena City Col. (Jr.), Pasadena, Calif.	1924	W. B. Longsdorf	4,092	6,166	297	—	53,000
Pasadena College, Pasadena, Calif.	1901	W. T. Purkiser	648	802	42	—	50,000
Peabody Inst. of the City of Baltimore, Baltimore, Md.	1857	Reginald Stewart	235	473	53	—	300,000
Peace College (Jr.), Raleigh, N.C.	1857	William C. Pressly	253	291	19	\$ 250,000	12,000
Pearl River Junior Col., Manville, Miss.	1912	Gavin H. Johnson	480	527	42	—	7,000
Pembroke State College, Pembroke, N.C.	1887	Walter J. Gale	154	174	16	—	23,055
Pennsylvania State College, Philadelphia, Pa.	1740	Gaylord P. Harnwell	8,569	14,944	2,773	50,000,000	1,475,000
Pennsylvania Military College, Chester, Pa.	1821	E. E. MacMortland	623	843	63	110,000	20,000
Pennsylvania State College of Optometry, Philadelphia, Pa.	1919	Albert Fitch	171	171	33	329,000	5,000
Pa. State Tch. Col., Bloomsburg, Pa.	1839	Harvey A. Andrus	906	946	51	—	35,000
Pa. State Tch. Col., California, Pa.	1852	C. Herman Grose	970	1,093	55	—	29,639
Pa. State Tch. Col., Cheyney, Pa.	1837	James H. Duckrey	509	579	31	—	26,734
Pa. State Tch. Col., Clarion, Pa.	1866	Paul G. Chandler	639	664	46	—	32,466
Pa. State Tch. Col., Stroudsburg, Pa.	1893	Theodore M. Moore	978	983	69	—	50,000
Pa. State Tch. Col., Edinboro, Pa.	1857	Thomas R. Miller	585	730	47	—	35,000
Pa. State Tch. Col., Indiana, Pa.	1871	Willis E. Pratt	1,841	2,052	117	—	46,821
Pa. State Tch. Col., Luzerne, Pa.	1866	G. A. W. Rohrbach	856	958	58	—	44,800
Pa. State Tch. Col., Lock Haven, Pa.	1877	Richard T. Parsons	863	688	49	—	35,000
Pa. State Tch. Col., Mansfield, Pa.	1858	James G. Morgan	636	647	75	—	48,000
Pa. State Tch. Col., Millersburg, Pa.	1854	D. L. Biemesderfer	1,084	1,173	90	—	41,581
Pa. State Tch. Col., Shippensburg, Pa.	1871	Harry L. Kriner	931	975	54	—	27,000
Pa. State Tch. Col., Slippery Rock, Pa.	1889	Dale W. Houk	854	903	81	—	65,000
Pa. State Tch. Col., West Chester, Pa.	1869	Charles S. Swope	1,837	1,974	121	517,000	430,000
Pennsylvania St. Univ., University Pk., Pa.	1855	Eric A. Walker	13,026	14,433	1,625	—	8,000
Perkinston Junior Col., Perkins, Miss.	1911	J. J. Hayden, Jr.	523	527	42	1,200,000	25,000
Pfeiffer College (Jr.), Winkelman, N.C.	1903	J. Lem Stokes, Jr.	528	534	60	489,000	31,000
Philadelphia Textile Inst., Philadelphia, Pa.	1884	M. W. Fayette Harris	627	627	50	1,283,000	70,200
Philander Smith College, Little Rock, Ark.	1868	Eugene S. Briggs	852	1,141	69	—	11,763
Philips University, And., Okla.	1906	Robert J. Hannelly	1,259	3,359	62	350,000	10,000
Phoenix College (Jr.), Phoenix, Ariz.	1920	A. A. Page	408	548	35	26,408,554	722,229
Pikeville College (Jr.), Pikeville, Ky.	1889	F. C. Ferry, Jr.	228	228	44	—	19,000
Pine Manor Junior Col., Wellesley, Mass.	1911	H. E. Litchfield	8,313	16,791	2,006	9,000,000	240,000
Pittsburgh University of Pittsburgh, Pa.	1878	Harold E. Hyde	338	488	44	—	3,000
Plymouth Teachers Col., Plymouth, N.H.	1870	O. H. Shires	1,005	1,017	113	—	5,000
Pomona College, Claremont, Calif.	1887	E. Wilson Lyon	260	275	20	—	66,000
Porterville College (Jr.), Porterville, Calif.	1927	O. H. Shires	310	393	26	—	12,000
Port Huron Junior Col., Port Huron, Mich.	1923	A. Ross MacLaren	1,100	1,186	125	—	10,000
Portland University of Portland, Ore.	1901	Howard J. Kenna	429	476	39	—	49,890
Palomac St. Col. of W. Virginia Univ. (Jr.), Keyser, W. Va.	1902	Ernest E. Church	252	256	184	—	175,000
Prairie View Agri. and Mech. Col., Prairie View, Tex.	1876	Edward B. Evans	1,801	3,789	359	10,558,967	43,325
Pratt Institute, Brooklyn, N.Y.	1887	Francis H. Horn	476	485	33	328,996	1,500,000
Presbyterian College, Clinton, S.C.	1880	Marshall W. Brown	146	175	16	73,162,000	52,000
Presbyterian Junior Col., Maxton, N.C.	1929	Louis C. LaMotte	3,466	3,466	527	1,126,912	43,125
Princeton University, Princeton, N.J.	1746	Harold W. Dadds	4,441	4,443	45	57,000	10,000
Principia College, Elmhurst, Ill.	1898	William E. Morgan	1,516	1,536	110	—	23,000
Providence College, Providence, R.I.	1917	Robert J. Slavin	620	1,820	79	290,842	23,000
Pueblo Junior College, Pueblo, Colo.	1933	Marvin C. Kaudson	771	796	53	2,040,525	375,000
Puerto Rico Polytechnic Institute of San German, P.R.	1912	Ronald C. Bauer	8673	13,382	769	—	32,000
Puerto Rico Univ. of Rio Piedras, P.R.	1903	Jaime Benítez	1,217	1,766	95	812,600	92,000
Puget Sound College of Tacoma, Wash.	1888	R. Franklin Thompson	1,121	1,259	1,267	6,000,000	280,000
Purdue University, Lafayette, Ind.	1869	Frederick L. Howde	11,201	11,259	1,267	89,000	42,000
Queens College, Charlotte, N.C.	1857	Edwin R. Walker	367	384	37	—	32,000
Queens College, Flushing, N.Y.	1937	Thomas V. Garvey	3,678	7,467	287	12,000	92,000
Queen's University, Kingston, Ont., Can.	1841	W. A. Mackintosh	2,395	2,446	587	6,000,000	280,000
Quincy College, Quincy, Ill.	1860	Julian Woods	468	572	52	—	42,000
Radcliffe College, Cambridge, Mass.	1879	Wilbur K. Jordan	1,401	1,401	3,473	11,409,619	116,000
Radford College, Woman's Div. of Virginia Polytech. Inst., Radford, Va.	1910	C. K. Marlin, Jr.	890	951	60	—	40,000
Randolph-Macon College, Ashland, Va.	1830	J. Earl Moreland	407	430	38	1,810,988	49,000
Randolph-Macon Woman's Col., Lynchburg, Va.	1893	W. F. Quillian, Jr.	675	675	83	1,476,008	81,000
Redlands College of Redlands, Calif.	1907	George H. Armastest	1,000	1,245	120	4,192,449	95,000
Reed College, Portland, Ore.	1904	Frank L. Griffin	542	579	66	2,055,466	104,591
Reedley College (Jr.), Reedley, Calif.	1926	Gustav A. Reimer	634	728	48	—	9,000
Regis College, Denver, Colo.	1888	Richard F. Ryan	613	886	68	108,000	59,311
Regis College, Weston, Mass.	1927	Sister Mary Alice	580	582	68	\$ 227,200	48,000
Reinhardt College (Jr.), Waleska, Ga.	1883	J. R. Burgess, Jr.	113	116	18	316,558	5,000
Rensselaer Polytechnic Inst., Troy, N.Y.	1824	L. W. Houston	2,991	3,568	427	23,506,608	57,000
Rhode Island Univ. of Kingston, R.I.	1892	William C. Woodward	2,643	2,301	268	—	139,804*
Rhode Island Col. of Educ., Providence, R.I.	1854	Carl R. Gaige	561	1,453	78	—	25,000
Rhode Island Sch. of Design, Providence, R.I.	1877	John R. Frasier	1,797	1,797	73	6,916,277	23,000
Rice Institute, Houston, Tex.	1912	William V. Houston	679	721	140	45,500,000	275,000
Richmond Univ. of (incl. Westminster Col.), Richmond, Va.	....	George M. Modlin	1,634	2,524	164	3,564,967	125,000
Richmond Professional Inst. of the Col. of William and Mary, Richmond, Va.	1917	Henry H. Hibbs	1,384	2,595	194	100,000	36,000
Ricks College (Jr.), Richfield, Me.	1848	David H. Cotton	80	84	14	—	10,000
Ricks College, Rexburg, Ida.	1888	John L. Clarke	693	703	43	—	25,000
Rider College, Trenton, N.J.	1863	Franklin F. Moore	779	1,593	84	1,329,231	25,000
Ripon College, Ripon, Wis.	1850	Fred O. Pinkham	523	523	35	1,512,100	67,000
Riverside College (Jr.), Riverside, Calif.	1916	Oriand W. Noble	826	856	53	—	22,000
Riviera College, Nashua, N.H.	1933	Sr. Adelard Marie	183	307	31	126,000	35,000
Roonoke College, Salem, Va.	1842	H. Sherman Oberly	505	505	37	802,660	35,061
Rochester University of Rochester, N.Y.	1850	C. W. de Kiewit	2,902	5,028	914	60,999,261	596,914
Rockford Col. (incl. Rockford Men's Col.), Rockford, Ill.	1847	Leland H. Carlson	254	722	60	1,850,665	43,156
Rockhurst College, Kansas City, Mo.	1910	M. E. Van Arcken	540	1,037	79	—	36,050
Rocky Mountain College, Billings, Mont.	1883	Herbert W. Hines	193	211	29	531,663	28,000
Rollins College, Winter Park, Fla.	1885	Hugh F. McKean	576	876	80	3,470,000	93,495
Roosevelt University, Chicago, Ill.	1875	Edward J. Sparling	1,913	3,894	206	275,000	98,000
Rosary College, River Forest, Ill.	1848	Sister M. Timothea	578	726	81	231,116	73,545
Rose Polytechnic Inst., Terre Haute, Ind.	1921	Mother M. Chrysostom	396	398	59	—	51,600
Royal Military Col. of Canada, Kingston, Ont., Can.	1874	Forrest L. Wilkinson, Jr.	394	401	40	2,869,714	26,000
Russell Sage College, Troy, N.Y.	1876	D. A. R. Bradshaw	411	411	70	—	46,000
Rust College, Holly Springs, Miss.	1916	Lewis A. Froman	689	705	55	1,184,280	65,327
Rutgers Univ., New Brunswick and Newark, N.J.	1866	Lee M. McCoy	257	257	55	31,893	26,327
Sacramento Jr. Col., Sacramento, Calif.	1916	J. Paul Mohr	2,244	2,383	127	—	42,000
Sacramento State Col., Sacramento, Calif.	1947	Guy A. West	2,218	4,398	193	—	67,000
Sacred Heart Col. of the Santitas, P.R.	1880	Mother Rosa Aurora	98	148	24	56,540	24,000
Sacred Heart Jr. Col. and Acad., Belmont, N.C.	1892	Mother M. Maura	189	196	18	16,650	9,000
St. Ambrose College, Davenport, Ia.	1882	William J. Collins	1,008	1,368	68	30,307	35,000
St. Anselm's College, Manchester, N.H.	1889	Bernard C. Dolan	619	785	58	—	40,000
St. Augustine's College, Raleigh, N.C.	1867	James A. Boyer	443	444	58	300,000	24,000
St. Bede Junior College, Peru, Ill.	1891	Lawrence Vohs	70	70	17	—	15,000
St. Benedict's College of St. Joseph, Minn.	1913	Mother R. Peters	244	289	45	—	25,000
St. Bernard's College, Athens, Kan.	1859	Culbert McDonald	600	600	60	—	118,000
St. Bernard College (Jr.), St. Bernard, Ala.	1892	Bede E. Luibel	304	324	35	—	30,150
St. Bonaventure Univ., St. Bonaventure, N.Y.	1937	Edmund F. Christy	920	1,317	93	63,000	63,000
St. Catherine College of St. Paul, Minn.	1859	Brian Lhota	1,377	1,397	117	132,098	137,991
St. Charles College (Jr.), Catonsville, Md.	1905	Sr. Mary William	942	977	144	680,842	83,148
St. Dunstan's Col., Charlottesville, P.E.I., Can.	1831	Sr. Cyril Dukehart	135	135	16	—	30,000
St. Edward's Seminary, Kenmore, Wash.	1831	R. V. MacKenzie	180	182	22	—	14,000
St. Elizabeth's Col. of Convent Station, N.J.	1931	John R. Sullivan	126	126	13	—	16,000
St. Francis College of Joliet, Ill.	1899	Sr. Hildegard Marie	437	444	51	16,000	39,000
St. Francis College, Loretto, Pa.	1874	Sister M. Elvira	334	456	44	—	43,495
St. Francis Xavier Univ., Antigonish, N.S., Can.	1847	Xavier Crowley	649	659	37	1,862,067	23,000
St. John's Col. of Cleveland, Cleveland, O.	1853	H. J. Somers	1,002	1,062	63	600,000	55,000
St. John's College, Annapolis, Md.	1928	Robert B. Navin	368	753	70	—	33,000
St. John's Col., Camarillo and Los Angeles, Calif.	1896	Richard D. Weigle	136	136	24	1,317,377	50,000
St. John's University, Collegeville, Minn.	1926	J. W. Richardson	130	130	21	—	35,000
St. John's Seminary, Brookline, Mass.	1857	Baldwin Dworschak	1,093	1,095	80	323,000	96,500
St. Joseph College, Emmitsburg, Md.	1870	John A. Flynn	4,076	7,974	261	—	145,000
St. Joseph College, Hartford, Conn.	1809	Sister Hilda	260	301	48	—	18,500
St. Joseph Junior Col., St. Joseph, Mo.	1925	Mother M. Ehelreda	332	399	52	—	29,000
St. Joseph's College, Collegeville, Ind.	1915	Nelle Blum	470	470	20	—	10,113
St. Joseph's College, Philadelphia, Pa.	1889	Raphael H. Gross	771	779	60	240,000	60,000
St. Joseph's Col. for Women, Brooklyn, N.Y.	1851	Edward G. Jackson	1,378	2,631	95	—	40,000
St. Joseph's Sem. (Jr.), Callicoon, N.Y.	1916	William T. Dillon	317	317	47	69,544	39,279
Pascal F. Foley	1901	Pascal F. Foley	144	144	19	—	8,500

Institution and Location	Year Founded	Chief Executive	Full Time Students	Part Time Students	Faculty	Endowment	Bound Library Volumes	Institution and Location	Year Founded	Chief Executive	Full Time Students	Part Time Students	Faculty	Endowment	Bound Library Volumes
†St. Joseph's Univ., St. Joseph and Montclair, N.J., Can.	1864	T. Gallant	465	515	40	—	40,000	Schreiner Institute (Jr.), Kerrville, Tex.	1923	Andrew Edington	320	332	29	\$ 250,000	12,000
†St. Lawrence University, Canton, N.Y.	1856	Eugene G. Bewkes	1,270	1,297	90	\$2,000,000	110,000	†Scranton, University of, Scranton, Pa.	1888	John J. Long	1,112	1,849	113	2,500,000	46,580
†St. Louis University, St. Louis, Mo.	1818	Paul C. Reinert	6,709	10,108	1,198	4,707,628	546,785	†Scripps College, Claremont, Calif.	1926	Frederick Hard	201	201	33	4,958,489	48,600
†St. Martin's College, Olympia, Wash.	1895	Daniam Glenn	205	220	33	—	23,000	Seattle Pacific College, Seattle, Wash.	1891	C. Hoyt Watson	758	960	77	527,000	37,000
†St. Mary College, Spring, Kan.	1860	A. M. Murphy	297	407	60	—	60,000	Seattle University, Seattle, Wash.	1892	Ivan C. Crookshanks	1,768	2,914	175	—	50,000
†St. Mary of the Springs, College of, Columbus, O.	1868	Sister M. Angelita	309	309	41	—	30,000	Sauquoit, Cal. of the (Jr.), Visalia, Calif.	1925	Albert A. Lemieux	995	1,127	58	—	13,000
†St. Mary-of-the-Wasatch, College of, Salt Lake City, Utah	1926	Sr. Marie de Lourdes	68	96	15	—	1,654	Saton Hill University, South Orange, N.J.	1886	John L. McNulty	2,754	8,183	274	2,000,000	37,500
†St. Mary-of-the-Woods College, St. Mary-of-the-Woods, Ind.	1840	Sr. Francis Joseph	378	378	51	614,180	97,500	Shaw University, Greensburg, Pa.	1883	William A. Collier	491	606	64	—	8,800
†St. Mary's College, Notre Dame, Ind.	1844	Sister M. Madeleva	720	909	99	85,600	50,841	Shaw University, Raleigh, N.C.	1865	W. R. Strasser	522	594	38	316,000	8,800
†St. Mary's College, St. Mary's College, Calif.	1863	Brother W. Thomas	447	447	47	325,103	84,000	Shepherd College, Shepherdstown, W. Va.	1875	Troy R. Brady	559	582	35	—	26,000
†St. Mary's College, Winona, Minn.	1912	Brother J. Ambrose	656	660	53	—	34,000	Shiner College (Jr.), Mt. Carroll, Ill.	1873	G. Joseph Mullin	97	97	18	224,448	16,000
†St. Mary's Dominican College, New Orleans, La.	1842	Sister Mary Louise	213	321	30	—	25,000	†Shorter College, Rome, Ga.	1873	F. A. Christenberry	203	251	33	31,000	31,000
†St. Mary's Junior College, Raleigh, N.C.	1891	Richard G. Stone	298	313	30	—	30,000	†Sierra College, Yuba, Calif.	1919	Mother Mary Gerald	392	517	29	—	35,000
†St. Mary's Sem. and Univ., Baltimore, Md.	1841	Lloyd P. McDonald	590	590	30	—	103,000	†Sierra College, Yuba, Calif.	1936	Mother M. Weaver	528	565	38	—	16,000
†St. Mary's University, Halifax, N.S., Can.	1841	P. J. Lynch	281	391	43	326,780	30,000	†Simmons College, Boston, Mass.	1869	William E. Park	1,352	1,614	203	3,988,479	100,000
†St. Mary's University, San Antonio, Tex.	1852	Walter J. Buehler	1,008	1,468	129	300,000	70,000	†Simon Willmetts Col., Montreal, Que., Can.	1890	William E. Kerstetter	564	569	39	1,500,000	42,000
†St. Michael's College, Winooski Park, Vt.	1904	Francis E. Moriarty	722	803	48	80,000	35,000	†Skidmore College, Saratoga Springs, N.Y.	1926	Kenneth E. Norris	798	4,124	152	—	27,903
†St. Norbert College, West De Pere, Wis.	1874	D. M. Burke	1,737	1,745	72	1,185,137	138,000	†Sligo Valley Jr. Col., Mt. Vernon, Ohio	1926	G. A. Hodson, Jr.	256	878	47	—	6,000
†St. Olaf College, Northfield, Minn.	1863	Thomas C. Mulligan	220	226	19	—	28,000	†Smith College, Northampton, Mass.	1911	Henry T. Moore	1,034	1,043	111	1,210,555	77,000
†St. Paul Seminary, St. Paul, Minn.	1895	Rudolph G. Bandas	365	365	26	—	16,000	†South Carolina Univ. of Columbia, S.C.	1888	Benjamin F. Wright	2,235	2,260	225	16,132,913	400,933
†St. Paul's Seminary, St. Paul, Minn.	1888	Earl H. McClemey	433	443	38	600,000	13,000	†South Dakota State College, Brook, S.D.	1935	Virgil B. McCain, Jr.	133	208	17	160,000	8,106
†St. Peter's Polytech. Inst., Lawrenceville, Va.	1927	M. M. Bennett	664	700	44	—	49,000	†South Dakota State College, Brook, S.D.	1881	Leslie B. Whelan	210	227	27	—	12,000
†St. Peter's College, Jersey City, N.J.	1872	James J. Shanahan	1,560	2,046	123	69,000	138,000	†South Dakota State College, Brook, S.D.	1881	Edward McGraw	468	470	48	501,500	83,000
†St. Peter's College, Jersey City, N.J.	1898	W. P. Moody	167	612	44	—	3,869	†South Dakota State College, Brook, S.D.	1881	Donald S. Russell	3,485	4,423	272	—	47,525
†St. Rose College, Albany, N.Y.	1920	Sr. Catherine Francis	522	778	78	—	43,000	†South Dakota State College, Brook, S.D.	1881	B. C. Turner	1,102	1,883	194	—	371,000
†St. Scholastica College, Duluth, Minn.	1912	Mother M. Hughes	350	450	59	—	39,000	†South Dakota State College, Brook, S.D.	1881	F. L. Weeks	1,718	1,718	135	—	150,000
†St. Teresa College, Kansas City, Mo.	1867	Sr. M. B. O'Neill	289	437	48	—	32,000	†South Dakota State College, Brook, S.D.	1881	F. L. Weeks	718	723	67	185,118	22,000
†St. Teresa College, Winona, Minn.	1910	Sr. M. Camille Bowe	599	611	72	535,000	45,052	†South Dakota State College, Brook, S.D.	1881	F. L. Weeks	718	723	67	185,118	22,000
†St. Thomas College, St. Paul, Minn.	1885	Vincent J. Flynn	1,271	1,321	89	338,331	54,604	†South Dakota State College, Brook, S.D.	1881	F. L. Weeks	718	723	67	185,118	22,000
†St. Thomas College, St. Paul, Minn.	1947	V. J. Guinan	256	328	30	340,000	16,308	†South Dakota State College, Brook, S.D.	1881	F. L. Weeks	718	723	67	185,118	22,000
†St. Thomas University of Houston, Tex.	1897	John J. Byrnes	150	150	13	600,000	24,000	†South Dakota State College, Brook, S.D.	1881	F. L. Weeks	718	723	67	185,118	22,000
†St. Vincent College, Latrobe, Pa.	1846	Quentin L. Schaut	850	850	62	—	80,000	†South Dakota State College, Brook, S.D.	1881	F. L. Weeks	718	723	67	185,118	22,000
†St. Xavier College, Chicago, Ill.	1876	Mother Mary Huberta	319	482	61	186,862	42,000	†South Dakota State College, Brook, S.D.	1881	F. L. Weeks	718	723	67	185,118	22,000
†Salem College, Winston-Salem, N.C.	1772	Dale H. Gramley	321	339	43	1,100,000	65,000	†South Dakota State College, Brook, S.D.	1881	F. L. Weeks	718	723	67	185,118	22,000
†San Houston St. Col., Huntsville, Tex.	1928	Harmon Lowman	2,150	2,279	115	—	10,142	†South Dakota State College, Brook, S.D.	1881	F. L. Weeks	718	723	67	185,118	22,000
†San Angelo College (Jr.), Huntsville, Tex.	1879	R. M. Lowman	500	700	37	—	15,000	†South Dakota State College, Brook, S.D.	1881	F. L. Weeks	718	723	67	185,118	22,000
†San Antonio College (Jr.), San Antonio, Tex.	1925	Wayland P. Moody	1,140	4,491	164	—	6,000	†South Dakota State College, Brook, S.D.	1881	F. L. Weeks	718	723	67	185,118	22,000
†San Benito County Jr. Col., Hollister, Calif.	1919	Frank Bauman	40	43	25	—	—	†South Dakota State College, Brook, S.D.	1881	F. L. Weeks	718	723	67	185,118	22,000
†San Bernardino Valley College (Jr.), San Bernardino, Calif.	1926	John L. Lounsbury	1,774	6,076	231	—	32,000	†South Dakota State College, Brook, S.D.	1881	F. L. Weeks	718	723	67	185,118	22,000
†San Diego Col. for Women, San Diego, Calif.	1949	Catherine Parks	168	270	24	—	21,000	†South Dakota State College, Brook, S.D.	1881	F. L. Weeks	718	723	67	185,118	22,000
†San Diego Junior Col., San Diego, Calif.	1914	Walter L. Thatcher	2,359	3,941	334	—	20,000	†South Dakota State College, Brook, S.D.	1881	F. L. Weeks	718	723	67	185,118	22,000
†San Diego State College, San Diego, Calif.	1897	Malcolm A. Love	5,135	6,861	350	—	160,000	†South Dakota State College, Brook, S.D.	1881	F. L. Weeks	718	723	67	185,118	22,000
†San Francisco City College of (Jr.), San Francisco, Calif.	1935	Louis G. Conlan	5,248	6,603	249	—	40,000	†South Dakota State College, Brook, S.D.	1881	F. L. Weeks	718	723	67	185,118	22,000
†San Francisco University of, San Francisco, Calif.	1855	John F. X. Connolly	1,395	3,039	120	508,397	60,000	†South Dakota State College, Brook, S.D.	1881	F. L. Weeks	718	723	67	185,118	22,000
†San Francisco Col. for Women, San Francisco, Calif.	1921	Mother Marion Kent	364	428	44	110,500	112,000	†South Dakota State College, Brook, S.D.	1881	F. L. Weeks	718	723	67	185,118	22,000
†San Francisco St. Col., San Francisco, Calif.	1899	J. Paul Leonard	5,114	8,085	385	—	95,000	†South Dakota State College, Brook, S.D.	1881	F. L. Weeks	718	723	67	185,118	22,000
†San Jose Junior College, San Jose, Calif.	1921	H. R. Butcher	837	2,087	77	—	9,330	†South Dakota State College, Brook, S.D.	1881	F. L. Weeks	718	723	67	185,118	22,000
†San Jose State College, San Jose, Calif.	1857	John T. Wallquist	7,906	9,398	475	—	163,000	†South Dakota State College, Brook, S.D.	1881	F. L. Weeks	718	723	67	185,118	22,000
†San Luis Obispo Jr. Col., San Luis Obispo, Calif.	1936	Frank C. Holt	143	179	27	—	6,000	†South Dakota State College, Brook, S.D.	1881	F. L. Weeks	718	723	67	185,118	22,000
†San Mateo Col. of (Jr.), San Mateo, Calif.	1922	Elon Earl Hildreth	1,984	2,413	114	—	23,000	†South Dakota State College, Brook, S.D.	1881	F. L. Weeks	718	723	67	185,118	22,000
†San Rafael, Dominican Col. of, San Rafael, Calif.	1915	Sr. Mary Patrick	330	353	54	—	44,186	†South Dakota State College, Brook, S.D.	1881	F. L. Weeks	718	723	67	185,118	22,000
†Santa Ana College (Jr.), Santa Ana, Calif.	1915	D. C. McNaughton	376	1,146	50	—	23,249	†South Dakota State College, Brook, S.D.	1881	F. L. Weeks	718	723	67	185,118	22,000
†Santa Barbara Jr. Col., Santa Barbara, Calif.	1946	Leonard L. Bowman	490	614	37	—	85,000	†South Dakota State College, Brook, S.D.	1881	F. L. Weeks	718	723	67	185,118	22,000
†Santa Clara Univ. of, Santa Clara, Calif.	1861	Herman J. Hawk	1,057	1,287	96	1,961,180	20,000	†South Dakota State College, Brook, S.D.	1881	F. L. Weeks	718	723	67	185,118	22,000
†Santa Monica City College (Jr.), Santa Monica, Calif.	1929	Wade F. Thomas	2,954	7,424	201	—	20,000	†South Dakota State College, Brook, S.D.	1881	F. L. Weeks	718	723	67	185,118	22,000
†Santa Rosa Junior Col., Santa Rosa, Calif.	1918	Floyd P. Bailey	1,043	1,199	64	500,000	19,000	†South Dakota State College, Brook, S.D.	1881	F. L. Weeks	718	723	67	185,118	22,000
†Sarah Lawrence College, Bronxville, N.Y.	1926	Harold Taylor	388	391	99	471,600	65,000	†South Dakota State College, Brook, S.D.	1881	F. L. Weeks	718	723	67	185,118	22,000
†Saskatchewan University of, Saskatoon, Sask., Can.	1907	W. P. Thompson	2,989	3,279	337	534,000	144,000	†South Dakota State College, Brook, S.D.	1881	F. L. Weeks	718	723	67	185,118	22,000
†Savannah State College, Savannah, Ga.	1892	William K. Payne	839	901	75	—	21,000	†South Dakota State College, Brook, S.D.	1881	F. L. Weeks	718	723	67	185,118	22,000
†Scott College for Christian Workers, Nashville, Tenn.	1892	Foye G. Gibson	146	146	18	765,000	8,000	†South Dakota State College, Brook, S.D.	1881	F. L. Weeks	718	723	67	185,118	22,000

Institution and Location	Year Founded	Chief Executive	Full Time Students	Part Time Students	Faculty	Endowment	Bound Library Volumes
T Syracuse University, Syracuse, N.Y. . . .	1870	William P. Tolley	9,205	13,928	998	\$ 6,929,817	396,450
Taft College (Jr.), Taft, Calif. . . .	1922	Garlyn A. Basham	275	700	42	—	10,000
Talladega College, Talladega, Ala. . . .	1867	Arthur D. Gray	259	284	29	1,273,669	38,977
Tampa University of Tampa, Fla. . . .	1931	Ellwood C. Nance	1,092	1,372	63	550,000	47,000
Tarkio College, Tarkio, Mo. . . .	1883	Clyde H. Canfield	230	242	23	329,626	21,000
Tarleton St. Col. (Jr.), Stephenville, Tex. . . .	1899	E. J. Howell	834	884	65	187,167	37,000
Taylor University, Upland, Ind. . . .	1846	Evan H. Bergwall	487	506	38	116,829	30,564
Temple University, Philadelphia, Pa. . . .	1884	Robert L. Johnson	8,840	17,654	920	1,896,528	413,000
Tennessee University of Knoxville, Tenn. . . .	1794	Cloide E. Brehm	12,869	12,869	1,339	1,188,797	391,331
Tennessee A. and I. St. Univ., Nashville, Tenn. . . .	1909	Walter S. Davis	2,306	2,418	188	—	55,000
Tennessee Polytech. Inst., Cookeville, Tenn. . . .	1915	Everett Derryberry	2,161	2,366	134	—	61,000
Tennessee Wesleyan Col. (Jr.), Athens, Tenn. . . .	1866	LeRoy A. Martin	357	439	29	411,312	21,387
Texas A. and M. Col. of College Sta., Tex. . . .	1927	Henry W. Stilwell	5,861	807	40	209,000	5,000
Texas A. and M. Col. of College Sta., Tex. . . .	1876	David H. Morgan	5,863	6,088	551	—	239,000
Texas Christian Univ., Fort Worth, Tex. . . .	1881	Loagan Wilson	17,868	18,880	1,448	242,730,048	1,273,000
Texas College, Tyler, Tex. . . .	1873	McGruder E. Sadler	2,928	4,538	264	10,000,000	26,000
Texas Col. of Arts and Ind., Kingsville, Tex. . . .	1894	D. R. Glass	343	402	30	287,000	24,883
Texas Lutheran College, Searcy, Tex. . . .	1925	Ernest H. Pate	1,686	2,517	107	—	65,000
Texas Southern University, Houston, Tex. . . .	1947	Edward A. Seagabel	402	426	34	46,900	32,000
Texas Southern Col. (Jr.), Brownsville, Tex. . . .	1926	Samuel M. Nobrill	1,760	2,994	182	—	23,000
Texas State Col. for Women, Denton, Tex. . . .	1903	C. J. Garland	306	896	63	—	130,431
Texas Technological Col., Lubbock, Tex. . . .	1923	John A. Quinn	2,006	2,204	175	—	300,512
Texas Wesleyan College, Ft. Worth, Tex. . . .	1891	Edward N. Jones	6,236	6,430	373	—	30,000
El Paso, Tex. . . .	1913	Dysart E. Holcomb	2,283	3,703	164	517,000	73,000
Thiel College, Greenville, Pa. . . .	1866	Frederic Irwin	517	527	75	265,783	30,000
Thomson Junior College, Harvey, Ill. . . .	1927	Ernest M. Hanson	440	440	29	806,389	22,618
Tiffin College, Forsyth, Ga. . . .	1849	Carey T. Vinzant	239	5,612	27	71,000	194,192
Toledo, University of Toledo, O. . . .	1872	Asa S. Knowles	2,438	5,612	261	—	609,469
Toronto University of Toronto, Ont., Can. . . .	1827	Sidney E. Smith	9,953	11,610	1,565	1,947,000	27,500
Tougaloo S. Christian Col., Tougaloo, Miss. . . .	1869	S. C. Kinchloe	305	305	47	94,876	44,000
Transylvania College, Lexington, Ky. . . .	1780	Frank Anthony Rose	391	396	33	61,000,000	350,000
Trinity College, Burlington, Vt. . . .	1925	Mother M. Emmanuel	106	173	19	—	15,000
Trinity College, Hartford, Conn. . . .	1823	Albert C. Jacobs	906	—	95	—	350,000
Trinity College, Washington, D.C. . . .	1897	St. Mary Patrick	490	490	61	—	65,000
Trinity Univ. (incl. Jackson Col.), Medford, Mass. . . .	1869	James W. Laurie	907	1,708	103	1,493,313	72,000
Tulane Univ. of Louisiana, New Orleans, La. . . .	1852	Niles Yngve Wessell	3,374	3,989	619	12,088,819	250,000
Tulsa University of Tulsa, Okla. . . .	1834	Rufus C. Harris	3,931	5,751	885	207,500,000	350,600
Tusculum College, Greeneville, Tenn. . . .	1894	R. C. Pontius	2,865	4,926	175	3,920,000	144,600
Tuskegee Inst., Tuskegee Institute, Ala. . . .	1881	Raymond C. Rankin	250	492	23	740,000	25,800
Tyler Junior College, Tyler, Tex. . . .	1926	Luther H. Foster	1,642	1,800	202	10,263,463	110,000
U Union College, Barboursville, Ky. . . .	1879	Conway Boatman	381	664	35	752,976	23,000
Union College, Lincoln, Neb. . . .	1891	Harvey C. Hartman	618	840	44	—	57,000
Union Col. and Univ., Schenectady, N.Y. . . .	1795	Carter Davidson	2,927	2,305	375	15,000,000	150,000
University of Tennessee, Tenn. . . .	1834	W. Warren F. Jones	496	539	37	529,036	33,000
U.S. Coast Guard Acad., New London, Conn. . . .	1876	R. J. Mauerman	540	540	52	—	42,000
U.S. Merchant Marine Acad., Kings Point, N.Y. . . .	1938	Gordon McIntock	650	650	81	—	36,000
U.S. Military Academy, West Point, N.Y. . . .	1802	G. H. Davidson	2,239	2,239	322	—	148,000
U.S. Naval Academy, Annapolis, Md. . . .	1845	W. R. Smedberg III	3,479	3,479	555	—	151,691
U.S. Naval Postgrad. Sch., Monterey, Calif. . . .	1909	Earl E. Stone	952	952	96	—	220,000
Upper Iowa University, Fayette, Ia. . . .	1857	Eugene E. Garbee	300	315	30	318,786	26,000
Upsala College, East Orange, N.J. . . .	1893	E. B. Lawson	1,295	1,337	94	531,895	48,000
Ursinus College, Collegeville, Pa. . . .	1869	Norman E. McClure	676	684	55	1,300,000	47,000
Ursuline College, Louisville, Ky. . . .	1938	Mother M. Columba	198	307	28	28,000	26,000
Ursuline College for Women, Cleveland, O. . . .	1871	Mother Marie	253	253	34	—	320,000
Utah University of Salt Lake City, Utah . . .	1850	A. Ray Olpin	7,102	8,702	553	45,830	194,000
Utah State Agri. College, Logan, Utah . . .	1888	Darryl Chase	3,081	3,404	420	—	34,000
V Valdosta State College, Valdosta, Ga. . . .	1906	J. Ralph Thaxton	383	416	29	—	11,000
Vallejo College (Jr.), Vallejo, Calif. . . .	1945	Harry D. Wiser	548	594	50	—	12,000
Valley Forge Military Jr. Col., Wayne, Pa. . . .	1928	Milton G. Baker	719	719	72	2,000,000	128,000
Valparaiso University, Valparaiso, Ind. . . .	1859	Otto P. Kretzschmar	1,998	2,195	135	548,639	667,000
Vanderbilt University, Nashville, Tenn. . . .	1872	Harvie Brenzmann	3,065	3,097	742	34,448,803	667,000

Institution and Location	Year Founded	Chief Executive	Full Time Students	Part Time Students	Faculty	Endowment	Bound Library Volumes	Institution and Location	Year Founded	Chief Executive	Full Time Students	Part Time Students	Faculty	Endowment	Bound Library Volumes
Westminster Col., Salt Lake City, Utah	1875	J. Richard Palmer	453	467	32	\$ 140,000	22,000	Wisconsin State Col., Oshkosh, Wis.	1871	Forrest R. Polk	1,118	1,141	73	—	54,000
Westminster Theol. Sem., Philadelphia, Pa.	1929	Cornelius Van Til	70	71	9	130,000	25,000	Wisconsin State Col., Eau Claire, Wis.	1866	C. O. Newlin	896	1,138	69	—	39,000
West Texas State College, Canyon, Tex.	1909	James P. Connette	1,472	2,437	108	—	50,123	Wisconsin State Col., River Falls, Wis.	1874	E. H. Klempell	873	876	67	—	38,302
West Virginia Inst. of Tech., Morgantown, W. Va.	1895	William B. Aythell	702	749	53	—	32,000	Wisconsin State Col., Stevens Point, Wis.	1894	W. C. Hansen	1,144	1,154	75	—	55,000
West Virginia Univ., Morgantown, W. Va.	1891	W. J. L. Wallace	1,028	1,479	88	—	47,085	Wisconsin State Col., Superior, Wis.	1893	Jim Don Hill	825	1,103	64	—	64,531
West Virginia Wesleyan Col., Buckhannon, W. Va.	1867	Irin Stewart	5,204	5,900	487	125,700	300,000	Wisconsin State Col., Whitewater, Wis.	1868	P. C. Stoughton	994	1,003	71	—	55,000
Wharton County Junior Col., Wharton, Tex.	1946	W. J. Scarborough	725	800	36	500,000	42,000	Wittenberg College, Springfield, O.	1854	Pendleton Gaines	1,144	3,050	86	5,499,925	101,000
Wheaton College, Norton, Mass.	1834	A. M. Hodge	519	555	41	—	8,000	Wofford College, Woodstock, Md.	1867	Joseph F. Murphy	690	760	44	1,042,437	56,500
Wheaton College, Wheaton, Ill.	1860	V. Raymond Eeman	1,446	1,778	135	4,791,246*	77,000	Wooster College of, Worcester, Mass.	1866	Harold Benley	222	315	36	4,400,000	140,000
Whitlock College, Boston, Mass.	1889	Frances Mayfair	356	426	25	10,000	19,500	Worcester Polytech. Inst., Worcester, Mass.	1938	Arthur B. Bronwell	839	1,302	64	8,857,309	40,000
Whitman College, Walla Walla, Wash.	1859	Charles C. Maxey	718	725	59	3,715,786	92,000	Wyoming, University of, Laramie, Wyo.	1886	G. D. Humphrey	2,483	2,599	445	6,745,740*	190,087*
Whittier College, Whittier, Calif.	1907	Paul S. Smith	999	1,064	73	936,364	57,207	Xavier University, Cincinnati, O.	1831	Paul L. O'Connor	1,504	2,989	164	410,000	111,718
Whitworth College, Spokane, Wash.	1890	Frank F. Warren	745	839	289	92,848	121,813	Xavier University, New Orleans, La.	1925	Sr. M. Josephina	1,003	1,194	111	969,000	75,500
Wichita, Municipal Univ. of, Wichita, Kan.	1895	Harry F. Warren	3,056	4,392	75	641,059	18,000	Yakima Valley Jr. Col., Yakima, Wash.	1928	Harold A. Hoeglund	444	1,107	30	51,908,717	11,000
Wilkes College, Marshall, Tex.	1873	Julius S. Scott	900	1,605	73	1,500,000	40,000	Yale University, New Haven, Conn.	1881	A. Whitney Griswold	6,885	7,353	1,886	4,280,473	4,280,473
Wilkes College, Wilkes-Barre, Pa.	1842	Eugene S. Farley	1,007	1,063	83	2,837,976	56,500	Yankee College, Yonkers, N.Y.	1881	Adrian Rondelleau	235	266	29	875,000	30,000
Williamette University, Salem, Ore.	1930	Lewis W. Webb, Jr.	1,206	2,688	112	—	23,000	Yeshiva University, New York, N.Y.	1897	Samuel Belkin	1,912	2,508	568	1,543,710	125,000
Polytech. Inst. in Norfolk (Jr.), Norfolk, Va.	1893	Alvin Duke Chandler	1,558	1,580	120	2,700,470	245,471*	Young Harris Col. (Jr.), Young Harris, Ga.	1886	Charles R. Clegg	365	365	25	575,708	15,000
William Jewell College, Liberty, Mo.	1849	Walter Pope Binn	1,023	1,726	148	3,063,166	74,000	Yuba College (Jr.), Marysville, Calif.	1927	Howard W. Jones	2,222	4,339	265	1,171,640	75,198
William Jewell College, Williamstown, Mass.	1791	James P. Baxter III	1,023	1,023	147	17,001,909	219,000				677	1,281	44	—	10,000
William Woods College, Fulton, Mo.	1890	T. T. Swearingen	312	312	28	650,000	16,000								
Williamatic Sr. Tch. Col., Williamatic, Conn.	1889	J. Eugene Smith	267	277	50	—	22,000								
Wilmington Col. (Jr.), Wilmington, N.C.	1947	John T. Roggard	207	250	26	—	7,000								
Wilmington College, Wilmington, Pa.	1863	Samuel D. Marble	591	633	33	561,259	29,764								
Wilson College, Chambersburg, Pa.	1869	Paul Swain Havens	391	350	60	1,588,618	65,000								
Wingate Junior College, Wingate, N.C.	1896	Budd E. Smith	383	485	28	103,500	8,000								
Winston-Salem Tch. Col., Winston-Salem, N.C.	1892	Francis L. Atkins	800	800	51	100,000	36,000								
Winthrop College, Rock Hill, S.C.	1866	Henry R. Sims	1,020	1,068	116	—	120,000								

Uranium. All uranium ore mined in the United States is purchased by the U.S. Atomic Energy commission. Statistics on output and consumption of uranium are not available for publication. The Colorado plateau continued during 1956 as the main area of operations.

In 1956, in co-operation with the Union Carbide and Carbon Corp. and with the technical assistance of the A.E.C., the federal bureau of mines produced a motion picture in all-colour film titled *The Petrified River—The Story of Uranium*. The film shows the metal that becomes the fuel for atomic reactors, and its service for other humanitarian purposes. It depicts prospectors with Geiger counters and other instruments trying to locate uranium. It also shows drilling, mining and milling operations; the uranium reactor at Oak Ridge, Tenn.; and the preparation of radioisotopes and their use at hospitals and research centres in diagnosing and treating diseases.

A simplified handbook, *Facts Concerning Uranium and Exploration Production*, was published in Nov. 1956. It describes prospecting on private and public lands and ways of staking claims, and gives data on mining, milling and refining uranium ore.

Belgian Congo.—A new agreement signed in June 1955 covering the shipment of uranium to the United States and Great Britain, replaced the 1944 agreement, which was due to expire in 1956. Under the new agreement, which was to remain in force until July 31, 1965, the Belgian government would take necessary measures to give the Combined Development agency (combined U.S.-British purchasing organization) a purchase option on 90% of Congo production of uranium and thorium ores and concentrates during 1956 and 1957, and on 75% of this production in 1958-60. Negotiations to set the percentage for the remainder of the period of validity of the agreement were scheduled for 1960.

Brazil.—The United States and Brazil agreed on Aug. 3, 1955, to establish a co-operative uranium prospecting program.

Japan.—According to official sources, production of uranium ore in Japan was expected to begin in 1956. Basic surveys of the most important deposits were completed in 1955.

(See ATOMIC ENERGY; METALLURGY.)

(F. E. H.)

Urban Redevelopment: see BUILDING AND CONSTRUCTION INDUSTRY; HOUSING; MUNICIPAL GOVERNMENT; TOWN AND REGIONAL PLANNING; URBAN TRANSPORTATION, U.S.

Urban Transportation, U.S. As of Jan. 1, 1956, the urban transit industry in the United States was composed of 1,483 operating companies. This total included 1,399 companies engaged exclusively in the operation of motorbuses; 52 companies having composite fleets including motorbuses, electric railway cars or trolley coaches or both; 26 companies engaged exclusively in electric railway freight and switching service; and 6 companies using railway facilities exclusively in passenger service. There were 6 rapid transit systems (elevated and subway operations) included in the foregoing.

The transit industry in the United States carried 7,272,000 passengers during the first 8 months of 1956, or 4.98% less than the number carried during the corresponding period of 1955. Operating revenues for the first 8 months of 1956 totalled \$943,700,000, up nearly $\frac{1}{4}$ of 1% from the same period in 1955. Higher fares were wholly responsible for this increase in revenue.

Approximately 154 transit companies in U.S. cities of more than 25,000 population were granted fare increases during the 12-month period ended Dec. 31, 1955. During the first 8 months of 1956, there were 123 additional increases granted.

As of June 1, 1956, more than 20% of all U.S. cities having a



NEW TERMINAL BUILDING for the Staten Island ferry, N.Y., opened in 1956

universal city-wide fare had rates that ranged more than 15 cents and up to 21 cents; 57% were at 15 cents; 2% at 13 cents; 7½% at 12 cents; 13% at 10 cents, and less than ½ of 1% were less than 10 cents. The top rate of 21 cents was found in a few communities in the Chicago (Ill.) suburban area. Only one city of more than 25,000 population had a city-wide transit fare of 5 cents.

The declining trend in traffic levelled off during the year and the slightly improved financial condition of the transit industry

stimulated community leaders and public officials to give their support to transit companies in their efforts to furnish an improved service.

To persuade people to continue using its service, the transit industry endeavoured to improve operations and offer a better, more dependable and faster ride. A faster ride seemed to be the first requirement of the public, and to offer it transit companies had to have community co-operation. Municipalities showed increasing inclination to adopt specific suggestions for giving transit a better opportunity to play its full role in moving people.

Some of these steps were: providing separate streets, or separate

exclusive lanes, for the transit vehicle; routing transit vehicles more directly to cut travel time; allowing for transit lanes in expressway construction; establishing fringe parking lots to ease traffic; restricting on-street parking, stopping, loading and delivery where they interfered with transit, not only downtown, but during rush hours for considerable distances along principal arterial streets.

Many transit operations accomplished important advances in service, economy, public relations, advertising, tax relief and regulatory assistance. One important development during the year was the appointment of an industry committee on new bus design. The committee's general objective was to develop a radically new type of transit bus with sufficient attraction in appearance and perform-

U.S. Urban Transportation Statistics, 1955

Item	Amount	Item	Amount
Miles of line and miles of route operated (Dec. 31)		Vehicle miles operated (calendar year), total	2,447,500,000
Electric railway line	3,404	Electric railway car miles	561,100,000
Surface railway line	3,028	Surface railway car miles	178,300,000
Subway and elevated line	376	Subway and elevated car miles	382,800,000
Trolley coach line	1,800	Trolley coach miles	176,500,000
Motorbus line	46,200	Motorbus miles	1,709,900,000
Total line mileage	51,404	Total passengers carried (calendar year), total	11,529,000,000
Electric railway—miles of single track	6,197	Electric railway	3,077,000,000
Surface railway—miles of single track	4,976	Surface railway	1,207,000,000
Subway and elevated—miles of single track	1,221	Subway and elevated	1,870,000,000
Trolley coach—miles of negative overhead wire	3,428	Trolley coach	1,202,000,000
Motorbus—miles of route round trip	99,800	Motorbus	7,250,000,000
Passenger vehicles owned (Dec. 31), total	73,089	Revenue passengers carried (calendar year), total	9,189,000,000
Electric railway cars	14,532	Electric railway	2,586,000,000
Surface railway cars	5,300	Surface railway	845,000,000
Subway and elevated cars	9,232	Subway and elevated	1,741,000,000
Trolley coaches	6,157	Trolley coach	869,000,000
Motorbuses	52,400	Motorbus	5,734,000,000
Gross investment (Dec. 31), total	\$3,821,000,000	Number of employees (year average), total	198,000
Electric railway	2,902,000,000	Electric railway	66,000
Surface railway	616,000,000	Surface railway	25,000
Subway and elevated	2,286,000,000	Subway and elevated	41,000
Trolley coach	160,000,000	Trolley coach	16,000
Motorbus	759,000,000	Motorbus	116,000
Operating revenue (calendar year), total	\$1,426,400,000	Payroll (calendar year), total	\$864,000,000
Electric railway	439,800,000	Electric railway	285,000,000
Surface railway	175,500,000	Surface railway	108,000,000
Subway and elevated	264,300,000	Subway and elevated	177,000,000
Trolley coach	130,800,000	Trolley coach	70,000,000
Motorbus	855,800,000	Motorbus	509,000,000
Passenger revenue (calendar year), total	\$1,358,900,000	Expenditures for materials (calendar year), total	\$180,400,000
Electric railway	404,100,000	Maintenance materials	89,000,000
Surface railway	146,600,000	Operating materials	91,400,000
Subway and elevated	257,500,000	Coal	13,100,000
Trolley coach	128,500,000	Gasoline	36,300,000
Motorbus	826,300,000	Diesel oil	15,000,000
		Propane	1,900,000
		Lubricants	2,900,000
		Electric power (purchased)	22,200,000
		Electrical energy consumed, kw.hr. (calendar year)	3,460,000,000

ance to make the public want to ride it in preference to using their own automobiles. The specific objectives included more eye appeal, less weight, faster loading and unloading, more comfortable seats, less noise and improved ventilation. The committee was being actively supported by bus manufacturers. There was considerable support of the drive toward air conditioning in transit buses. Air conditioning of the mass transit bus was not completely new. One company had put 50 air-conditioned buses in operation in 1947 and they were still in regular service. During 1956 four more companies had placed air conditioning units in regular or experimental service.

(See also MUNICIPAL GOVERNMENT; RAILROADS.)

(A. W. Br.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Arteries of New York City* (1952); *Development of Transportation* (1931).

Uruguay. A republic in southeastern South America, Uruguay is bounded on the north by Brazil, on the south by the Río de la Plata, on the east by the Atlantic ocean and on the west by Argentina. It is the smallest country in South America, with an area of 68,369 sq.mi. It has a population of 2,800,924 (1954 est.), mostly of European extraction. Montevideo, the capital, has 810,969 inhabitants (1954 est.). Other leading cities (pop., 1954 est.) are Mercedes 44,900; Salto 44,900; Paysandú 44,000; Minas 36,700; Melo 36,000; Florida 34,200; Rocha 34,000. Religion: Christian, mostly Roman Catholic. President of the governing national council in 1956: Alberto F. Zubiria.

History.—Uruguay's nine-member national council of government found itself challenged by severe economic and political problems during 1956. There were a number of cabinet resignations in May, mostly arising out of disagreements over whether an income tax should be imposed and out of the frustration of trying to function under a reputedly indecisive and cumbersome plural executive. Dissatisfaction with the government reached a climax in July when various Colorado party factions as well as the Herrerista sector of the Nationalist party began campaigning for restoration of a single executive.

Critics especially scored the national council's ineffectiveness in handling critical economic and financial problems. The treasury was being heavily overburdened by the large bureaucracy and the many socialized activities of the nation. The price of staples rose rapidly. The export trade in wool, beef and wheat was sluggish, causing foreign exchange earnings to fall drastically and the value of the peso to decline sharply by May to a low of four to the dollar. The currency was stabilized in August when the government decreed various complicated exchange modifications representing a mild devaluation and a relaxation of trade restrictions. Uruguay's failure to find markets for many of its commodities led to some friction with the United States which it accused of violating hemisphere agreements by dumping surplus commodities such as wheat, cotton and corn on the world market.

Economic problems were aggravated in mid-1956 by strikes of railroad and packing workers who sought wage increases and other benefits. Operations were paralyzed in all packing plants, halting exports of frozen meat. Uruguay even found it necessary to import large quantities of beef from Argentina. Because of the delay in shipments, the German Federal Republic decided not to buy Uruguayan meat in the future. There was also a shortage of animals for slaughtering, caused in part by the constant problem of livestock being smuggled into Brazil, which allegedly cost Uruguay about \$30,000,000 in customs charges.

In February the national council invited the presidents of Argentina and Brazil to confer some time in mid-1956 on economic and cultural matters, such as the establishment of mutual trade benefits and deciding on means of raising their standards of living. In September this initiative was diverted by Argentina's proposal that the three nations should meet to discuss set-

ting up a South Atlantic Treaty organization modeled after NATO. Despite opposition in Uruguay to such a defense pact, the national council agreed to participate in discussions. (R. Hn.)

Education.—In 1953 there were 1,827 primary schools with 272,721 pupils and 8,337 teachers and (in 1952) 115 secondary schools with 37,858 students. The University of Montevideo had 11,603 students in 1951.

Finance.—The monetary unit is the peso, valued on Nov. 23, 1956, at 47.62 cents U.S. currency, basic rate; 24.39 cents, free certificate rate; and 25 cents, free rate. Ordinary government expenditure in 1955 (preliminary) was 505,700,000 pesos; revenue, 473,200,000 pesos. The public debt on July 31, 1956, was 1,212,715,000 pesos, of which 98,470,000 pesos represented the external debt. Currency in circulation (June 30, 1956) totalled 508,000,000 pesos; demand deposits, 365,000,000 pesos. The U.S. department of commerce estimated U.S. direct private investments in 1955 at \$74,000,000, of which manufacturing investments accounted for \$36,000,000. The cost-of-living index (Montevideo) stood at 128 in Aug. 1956 (1953=100).

Trade and Communications.—Exports in 1955 totalled \$183,678,000; imports, \$225,958,000. Leading exports were wool (40%), grain (26%), textiles (19%), hides (8%) and meat and products (4%); leading imports, raw materials, including sugar, iron and steel and cotton (32%), fuel and lubricants (12%), construction materials (9%), motor vehicles (8%) and machinery and parts (4%). Leading customers were the Netherlands (23%), Brazil (14%), the U.K. (14%), the U.S. (9%) and France (5%); leading suppliers, the U.S. (19%), Brazil (17%), the U.K. (13%), Germany (8%) and France (6%).

Railways (1954) totalled 1,928 mi.; highways (1955) totalled about 26,000 mi., of which 3,100 mi. were paved national roads. On Jan. 1, 1954, there were 48,012 automobiles, 40,100 trucks and 1,523 buses. According to *Lloyd's Register of Shipping*, the merchant marine had 41 vessels (100 tons and over) aggregating 65,846 gross tons on June 30, 1955. Telephones (Jan. 1, 1955) numbered 109,300, of which 75% were automatic and located in Montevideo.

Agriculture.—Official preliminary production estimates for major crops in the crop year 1955-56 (in metric tons) were as follows: wheat 797,000; linseed 56,019; oats 35,882; barley 11,002; malt barley 29,598; birdseed 2,151; (calendar year 1955) maize 197,049; rice 68,000; sunflower seed 84,314; peanuts 5,104. The 1951 agricultural census showed 23,408,642 sheep, 8,154,109 cattle, 511,547 milk cows, 667,251 horses and 258,980 pigs. Wool exports in the calendar year 1955 amounted to 49,424 metric tons. Meat exports in 1955 included only 3,520 metric tons of frozen beef, 4,994 tons of canned beef and 373 tons of frozen mutton.

Manufactures.—In 1954 there were an estimated 25,000 industrial establishments with invested capital of 1,005,000,000 pesos and production valued at 1,202,000,000 pesos. Industrial workers totalled 180,185 in 1951. Production estimates for 1955 included cement 296,000 metric tons; rolled steel products 22,000 tons; sulphuric acid 8,300 tons; tires 149,000 units, inner tubes 68,000 units. Installed electric energy capacity (Dec. 31, 1955) was 290,000 kw. (J. W. Mw.)

U.S.S.R.: see UNION OF SOVIET SOCIALIST REPUBLICS.

Utah. A Rocky mountain state of the United States, admitted to the union in 1896, Utah is popularly known as the "Beehive state." Area: 84,916 sq.mi. (82,346 sq.mi. land, 2,570 sq.mi. water). Pop.: (1950 census) 688,862; (1956 provisional est.) 812,000; urban pop. 65.3% of total (1950 census), foreign-born 4.3%, nonwhite 1.7%. Capital: Salt Lake City, pop. (1956 est.) 205,000; other principal cities (1956 est.) pop.: Ogden (65,800), Provo (34,100), Logan (18,000).

History.—The major event of the year for Utah was the enactment of public law 485 by the 84th congress of the United States creating the Colorado River Storage project. When Pres. Dwight D. Eisenhower signed the bill into law on April 11, 1956, he brought to fruition about 36 years of work to get this much needed program for Utah. In 1922, the Colorado River compact was negotiated among the seven states served by the Colorado river. This compact provides for division of river water between the Upper and Lower basins, with each basin granted 7,500,000 acre-feet each year. Upper basin states are Colorado, New Mexico, Utah and Wyoming. Lower basin states are Arizona, Nevada and California.

In 1948 the Upper Basin states negotiated a compact dividing the water allocated to them. The pact also created the Upper Colorado River commission made up of representatives from the four states and the federal government. Plans for the Upper Basin Colorado River Storage project were completed in 1950 and after six years of intensive work the United States congress passed the law which President Eisenhower had made part of his legislative program.

Conservation interests in the nation and California opposition led to the elimination of Echo dam from the program, which left the Glen Canyon dam as the project of major significance to Utah. This unit was to be a 580-ft. high dam, 1,400 ft. in length, with a cost estimated at \$379,143,000. It would form a reservoir with a capacity of 26,000,000 acre-feet of water and it would extend 186 mi. up the Colorado river and 71 mi. up the San Juan river. It would have installed capacity to generate 800,000 kw., and an average power output of nearly 4,000,000,000 kw.hr. each year.

With \$13,000,000 appropriated by congress, preliminary construction started late in 1956 on certain phases of the Colorado River Storage project and on Oct. 15, 1956, President Eisenhower signalled the start of the tremendous project by pressing a button which ignited explosions at the Glen Canyon and Flaming Gorge dam sites.

In the presidential election year, Utah interest centred around the primary contests for the governorship. Incumbent Gov. J. Bracken Lee was defeated in a close race for the Republican nomination by George D. Clyde, a leader in the fight for the Colorado River project. L. C. Romney, Salt Lake City commissioner, defeated John S. Boyden for the Democratic nomination. On Oct. 13 Governor Lee injected further interest in this race by announcing his candidacy as an independent candidate.

In the general election of Nov. 6, 1956, Utah voters by a large majority voted for the re-election of Pres. Dwight D. Eisenhower. In the gubernatorial contest, the regular Republican candidate, George D. Clyde, won in a close contest over the Democratic opponent, L. C. Romney, and incumbent J. Bracken Lee who ran as an Independent. Incumbent U.S. Sen. Wallace F. Bennett (Rep.) retained his seat, defeating Alonzo F. Hopkin (Dem.).

In the congressional races, incumbent H. Aldous Dixon (Rep.) defeated Carlyle F. Gronning (Dem.) in the first congressional district. The second district race was won by incumbent William A. Dawson (Rep.) over Oscar W. McConkie (Dem.).

The Republican party made a clean sweep of state offices, returning the following candidates in addition to the governor: Lamont F. Totonto, secretary of state; E. R. Callister, attorney general; Sid Lambourne, auditor; and Sherman J. Preece, treasurer.

As a result of the election, Republicans in Utah had comfortable working margins in both houses of the state legislature.

Education.—For the 1954-55 school year there were 119,476 full-time elementary students enrolled in 380 elementary schools and 71,976 full-time secondary students enrolled in 141 secondary schools. This total of 191,452 was an increase of 8,288 over the 1953-54 figure. With principals and supervisors the total instructional staff for the state reached 6,894, an increase of 689 over the previous year.

Funds available for education totalled \$69,821,249.24. Disbursements \$65,251,571.68. E. Allen Bateman was superintendent of public instruction in Utah during 1956.

Social Insurance and Assistance, Public Welfare and Related Programs.—Total expenditures for public assistance during the fiscal year July 1955 to June 1956 amounted to \$14,889,374.36 (for 25,486 persons), which was a decrease of \$362,557.50 from the 1954-55 figure. The funds were distributed (excluding administrative expense) as follows: old-age assistance \$6,756,867.61 (9,535 persons); aid to dependent children \$3,945,449.51 (10,733 persons); aid to the blind \$187,946.73 (265 persons); aid to the disabled \$1,408,149.39 (1,959 persons); aid to unemployables \$680,541.59 (1,052 persons); aid to employables \$499,699.69 (1,506 persons); foster care \$286,932.72 (436 persons); medical care and sight conservation \$35,325.59 (131 persons); welfare services \$223,087.69. Increased payments over the preceding year were noted in the following categories: administration and services, disabled, foster care, medical care and blind. Decreased payments were made to dependent children, employables, unemployables, and people of old age.

For the year July 1955 to June 1956 the four Utah welfare institutions reported the following expenditures and populations: industrial school at Ogden, \$400,000 and 173 students; mental hospital at Provo, \$1,784,700 (plus \$300,000 for new buildings) with 1,277 patients; training school at American Fork, \$717,800 (plus \$450,000 for new buildings) with 871 students; tuberculosis sanatorium at Ogden, \$211,724.31 with 75 patients.

Communications.—All highways and roads in the state totalled 31,415.6 mi. Of that amount 16,378.9 mi. were surfaced roads. State and federal funds disbursed for highways amounted to \$21,588,119 for the fiscal year ending June 30, 1956. New or rebuilt roads completed during the fiscal year totalled 425 mi. Total registered motor vehicles as of Dec. 31, 1955,

numbered 336,948. All railroads operating in the state numbered nine in 1956, with track mileage (within the state) of 2,924.99 and line mileage of 1,791.96 (as of Dec. 31, 1955); the track mileage included 95.51 mi. owned by three terminal companies in the state. Airports and airfields in 1956 numbered: commercial and municipal, 48; military, 5; private, 12; emergency strips, 38; mining strips, 37; other, 5. Regularly scheduled air lines operating in the state numbered three in 1956. Operating radio stations in 1956 numbered 21 AM stations and 4 FM stations. There were three operating television stations in 1956.

Banking and Finance.—As of June 30, 1956, the 43 state banks had resources totalling \$486,432,924.18 and the 7 national banks \$360,715,537.56 for a combined total of \$847,148,461.74, an increase of \$36,239,656.01 over 1955. Deposits for the 43 state banks reached \$447,740,322.20, while the 7 national banks noted deposits of \$336,599,321.84 for a combined total of \$784,339,644.04. There were 16 state-chartered savings and loan associations with total resources of \$115,838,783.13, an increase of \$24,217,000.50 over the total assets of the 15 such companies as of June 30, 1955.

State receipts for the fiscal year ending June 30, 1956, were \$125,466,713.28; disbursements amounted to \$117,891,178.26. There was no bonded indebtedness for the state as a whole.

Table I.—Principal Agricultural Products of Utah

Crop	Indicated 1956	1955	Average, 1945-54
Barley, bu.	1,472,000	1,505,000	1,947,000
Wheat, bu.	6,084,000	6,723,000	5,929,000
Oats, bu.	7,163,000	6,475,000	8,021,000
Corn, bu.	2,000,000	1,840,000	1,290,000
Potatoes, cwt.	1,534,000	1,598,000	1,652,000
Sugar beets, tons	416,000	437,000	480,000
Hay (all), tons	1,277,000	1,267,000	1,174,000
Peaches, bu.	360,000	480,000	610,000
Apples, bu.	350,000	440,000	416,000
Pears, bu.	330,000	200,000	187,000

Source: U.S. Department of Agriculture.

Agriculture.—For Utah, 1955 cash receipts from livestock and livestock products totalled \$107,194,000, down 3% from 1954 and the lowest since 1949; cash receipts from crops, at \$36,841,000 were down 5%, the lowest since 1944; total cash receipts amounted to \$146,721,000, down 3% from 1954. The total value of livestock on Utah farms as of Jan. 1, 1956, amounted to \$100,120,000.

Manufacturing.—Total wages for 1955 showed an increase of \$68,139,548 over 1954. The average monthly wage was \$303. (B. D. M.)

Table II.—Principal Industries of Utah

Industry	Av. workers per month	Total wages 1955
Mining	14,022	\$ 68,975,398
Contract construction	14,632	63,965,784
Manufacturing	33,352	141,313,312
Transportation, communication and utilities.	12,352	49,387,976
Wholesale and retail trade	52,087	160,288 ,071
Finance, insurance and real estate	8,929	30,995,531
Service	16,787	39,823,204
Miscellaneous	496	1,163,032
Total (all industries)	152,656	555,908,338

Table III.—Mineral Production of Utah

(In short tons, except as noted)

Mineral	Quantity 1953	Value 1953	Quantity 1954†	Value 1954†
Total		\$298,639,000		\$255,234,000‡
Asphalt (gilsonite)	61,000	2,184,000	76,000	2,724,000
Clays	198,000	1,458,000	207,000	1,991,000
Coke	6,544,000	37,689,000	5,008,000	29,761,000
Cool	1,492,000	?	1,056,000	?
Copper	269,000	154,691,000	212,000	124,983,000
Fluorspar	16,000	375,000	4,000	82,000
Gold (oz.)	483,000	16,920,000	403,000	14,119,000
Iron ore	5,171,000	26,497,000	3,405,000	19,277,000
Lead	42,000	10,879,000	45,000	12,322,000
Natural gas (thousand cu. ft.)	7,075,000	807,000	16,024,000	2,259,000
Petroleum (bbl.)	1,807,000	?	1,905,000	4,480,000
Salt	154,000	772,000	167,000	1,020,000
Sand and gravel	4,628,000	3,180,000	5,328,000	3,592,000
Silver (oz.)	6,726,000	6,087,000	6,179,000	5,593,000
Stone	997,000	1,447,000	1,127,000	1,546,000
Zinc	29,000	6,712,000	34,000	7,351,000
Other minerals . . . . .	...	28,941,000	...	24,696,000

*Values for processed materials are not included in the totals.

†Value included with other minerals.

‡Preliminary. §Total has been adjusted to eliminate duplication in the value of clays and stone.

Source: U.S. Bureau of Mines.

Mineral Production.—Table III shows the tonnage and value of those minerals produced in Utah in 1953 and 1954 whose values exceeded \$100,000, except for fluorspar, in 1954. Utah was second in output of copper, gold, molybdenum and silver in 1954, third in lead and selenium output, fifth in crude iron ore and sixth in zinc. It ranked 16th among the states in value of its mineral output, with 1.83% of the U.S. total.

ENCYCLOPEDIA BRITANNICA FILMS.—*Northwestern States*, 2nd ed. (1956); *Utah* (1955).

Utilities, Public: see PUBLIC UTILITIES.

Vacation: see TOURIST TRAVEL.

Vanadium: see MINERAL AND METAL PRODUCTION AND PRICES.

Varnishes: see PAINTS AND VARNISHES.

Vatican City State. This sovereign, independent state was established by the Lateran treaty between the Holy See and the Italian government on Feb. 11, 1929. The treaty was recognized in international law with the reigning pope as sovereign and was made an integral part of the constitution of Italy on March 26, 1947. The pope has full executive, legislative and judicial powers which he delegates to a commission of cardinals. The legal system is based on canon law; in the rare cases where this law does not apply the laws of Italy prevail.

Diplomatic representatives of 45 nations are accredited to the Vatican. The Holy See in its diplomatic relations with other governments is represented by 40 nuncios and internuncios.

The area of Vatican City is 108.7 ac. To this are added the following extraterritorial possessions: the basilicas of St. John Lateran, St. Mary Major and St. Paul, with the buildings attached; the edifice of San Callisto near Santa Maria in Trastevere; the papal palace and domain of Castel Gandolfo, the summer residence of the popes, 14 mi. S.E. of Rome; the property sites on the Janiculan hill of the Congregation for the Propagation of the Faith; the ex-convent buildings annexed to the Basilica of the Twelve Apostles and to the churches of Sant'Andrea della Valle and San Carlo ai Catanari; the palaces of the Dataria, the Cancellaria, the Propagation of the Faith in the Piazza di Spagna, the Holy Office, the Convertendi and the palaces of the Vicariate; about 160 ac. in all.

The normal population of Vatican City is approximately 1,000, most of whom are ecclesiastics. A total of 750 lay persons are enrolled in the pontifical armed corps: 500 Palatine guards of honour, 120 Swiss guards, 80 papal gendarmes and 50 noble guards. On May 6, 1956, the Swiss guards, oldest of the Vatican's four armed services and widely renowned for its brilliant 16th-century uniform of sky blue, orange and yellow, celebrated the 450th anniversary of its foundation.

The Vatican library ranks among the great libraries of the world. Its importance can be measured by the quality of its collection of more than 60,000 manuscripts. The collections were recently enriched by the acquisition of material bearing on biblical sources found near the Dead sea.

The Vatican contains an abundance of works of art that represent in their entirety an irreplaceable treasure. The paintings, sculptures and objects are grouped in specialized museums. These are the Museo Pio-Clementino, the Galleria Chiaramonti, the Braccio Nuovo, the Egyptian museum and the Etruscan museum.

(See also PIUS XII; ROMAN CATHOLIC CHURCH.)

(J. LAF.)

Veal: see MEAT.

Vegetable Oils and Animal Fats. The record soybean crop of 1956 almost alone maintained U.S. food fats and oils at approximately record levels. The more inclusive index of 1956 oilseed production stood at 155 (1947-49=100) as compared with 129 in 1955; included were 457,394,000 bu. of soybeans, 5,495,000 tons of

cottonseed, 1,488,575,000 lb. of peanuts and 51,948,000 bu. of flaxseed.

Prices to producers of oil-bearing crops in Oct. 1956 were 240% of the 1910-14 average, as compared with 227% in Oct. 1955 and an average of 318% for 1947-49. In Oct. 1956 prices to producers were: soybeans, \$2.07 per bushel (\$2.08 per bushel in 1955); cottonseed, \$54.10 per ton (\$43.50 in 1955); flaxseed, \$2.92 per bushel (\$2.76 in 1955); and peanuts, 11.6 cents per pound as compared with 11.8 cents per pound in 1955.

In line with record milk production, butter production was forecast at 1,600,000,000 lb. as compared with 1,566,000,000 lb. in 1955; consumption was 9 lb. per person. Consumption of margarine, largely from refined and hydrogenated soybean and cottonseed oils, of which about 1,350,000,000 lb. were produced in 1956, was 8 lb. per person. In addition an indicated 10 lb. of lard, 11 lb. of shortening and 10.1 lb. of "other edible fats and oils" were consumed.

Production of sesame seed, source of a high grade edible oil, expanded in the south, especially in Texas, to a level well above the 5,000,000 lb. of 1955.

Exports from the U.S. of fats and oils, including the oil equivalent of oilseeds, was a new record of about 2,700,000,000 lb. during 1955-56; the outmovement during 1956-57 was expected to approximate that of the previous year.

Table II.—World Exports of Fats, Oils, and Oilseeds

(In thousands of short tons)

Commodity	1955*	1954†	Average 1945-49	Average 1935-39
Edible vegetable oils	1,935	1,810	850	1,753
Palm oils	2,380	2,365	1,543	2,205
Industrial oils	680	885	479	1,008
Animal fats	1,505	1,445	765	885
Marine oils	700	745	405	710
Total	7,200	7,250	4,042	6,561

*Forecast. †Estimate.

Source: Foreign Agricultural Service, U.S. Department of Agriculture, Foreign Crops and Markets (Aug. 29, 1955).

With most of the major producers reporting new record crops of one or more of the vegetable oils and with most types of livestock at record levels, world production was expected in 1956-57 to rise by about 7,000,000 tons to a new record of 27,300,000 metric tons of which liquid edible oils would be 9,330,000 tons, animal fats 10,380,000 tons and the several palm products, 3,550,000 tons. Exports were forecast to exceed the record 6,830,000 tons of 1955.

World production of flaxseed was estimated at 173,500,000 bu. for 1956, of which the U.S. accounted for 51,948,000 bu. and Canada 37,300,000 bu.

Total world production of olive oil for 1956-57 increased to 986,000,000 tons (from 752,000,000 tons in 1955-56), of which the Spanish crop was estimated at about 390,000,000 tons, that of Italy at 150,000,000 tons and Greece and Tunisia at 100,000,000 tons. World production of whale and sperm oils was forecast at 425,000 and 105,000 tons, somewhat above that of 1955.

(See also COTTON.)

(J. K. R.)

Vegetables. Substantially larger amounts of most types of vegetables were available in the United States in 1956, for use fresh, for processing and, for a few types, for export. Consumption per capita was indicated at 148 lb. of fresh vegetables, 3% above 1955 but only 6% more than prewar. The canned product amounted to 42.1 lb. per capita, 1% more than 1955 and 42% more than prewar. Indicated consumption of frozen vegetables was 7.2 lb., 9% above 1955. The canned and frozen product accounted for about 44% of total consumption.

In the first seven months of 1956, U.S. exports of fresh vegetables, largely cabbage, carrots, celery, lettuce and tomatoes

Table I.—U.S. Production of Principal Fats and Oils

(In millions of pounds)

	1956*	1955†	1954	Average 1937-41
Butter	1,600	1,566	1,541	2,224
Lard	2,600	2,840	2,564	2,091
Edible tallow	275	278	269	225
Edible vegetable oils	6,538	6,112	5,382	2,254
Soap fats and oils	2,870	3,115	2,825	1,303
Drying oils	687	819	739	364
Other oils	225	227	222	228
Total	14,795	14,957	13,542	8,689

*Forecast. †Preliminary.

Table I.—U.S. Vegetable Production for Fresh Market
(In thousands)

Crop	Unit	Indicated 1956	1955	Average, 1949-54
Artichokes	boxes	800	890	787
Asparagus*	crates	3,886	3,380	3,703
Beans, lima	bu.	1,558	1,312	1,610
Beans, snap	bu.	15,927	18,777	18,175
Beets	bu.	1,304	1,333	1,634
Broccoli	crates	5,389	5,303	4,633
Brussels sprouts	tons	33,200	22,000	26,000
Cabbage	tons	1,275	993	1,183
Cantaloupes	crates	14,478	15,604	14,496
Carrots	bu.	30,495	29,080	30,598
Cauliflower	crates	12,597	12,215	12,162
Celery	crates	26,203	25,196	23,326
Corn, sweet	5 doz. ears	25,969	26,279	23,222
Cucumbers	bu.	7,788	8,126	7,321
Eggplant	bu.	1,375	1,541	1,444
Escarole	bu.	2,952	3,116	2,080
Honeydew melons	crates	3,581	3,624	3,156
Kale	bu.	1,011	1,022	1,140
Lettuce	crates	43,899	41,876	38,298
Onions	sacks	48,158	42,715	42,867
Peas, green	bu.	1,099	1,457	2,059
Peppers, green	bu.	10,586	11,808	9,723
Shallots	bbl.	195	230	145
Spinach	bu.	9,530	8,939	10,912
Tomatoes	bu.	40,075	39,605	34,654
Watermelons	melons	120,225	131,390	103,491

*Includes processing.

to Canada, were 553,000,000 lb., 6% more than for the same months of 1955. U.S. fresh vegetable imports, mostly from Cuba and Mexico, and largely tomatoes, cucumbers, peppers and melons, were 321,000,000 lb. in the period January through July 1956, 18% more than in the corresponding period of 1955.

The price index for commercial vegetables in October (not adjusted for season of year) was 203 (1910-14=100), as compared with 208 a year earlier.

Commercial Truck Crops for the Fresh Market.—Season by season, 1956 production exceeded that of 1955 and the 1949-54 average. Total tonnage was indicated at 11,041,700 tons, as compared with 10,682,700 tons in 1955 and 10,095,900 tons average. Higher yields rather than expanded acreage gave the increase; indicated area was 2,215,010 ac., as compared with 2,253,540 ac. the previous year and 2,205,010 ac. for 1949-54.

The U.S. department of agriculture proposed revision of fresh tomato standards. Acreage marketing guides for 1957 covering 18 major winter vegetables recommended a total acreage 5% below 1956. Beginning with the 1957 crops, official yield and production statistics for fresh market vegetables were to be published on a weight basis.

Commercial Truck Crops for Processing.—Early reports on nine of the 11 major processing vegetables, usually representing about 96% of the total tonnage, indicated a crop of 8,080,000 tons, as compared with 5,910,000 tons in 1955 and 5,750,000 tons average for 1945-54. Snap beans, beets for canning, kraut cabbage grown on contract, sweet corn, green peas and tomatoes for processing were highest of record, and most or all the others were near record. The canned pack was at record high levels for snap beans, tomatoes and sweet corn, the latter with carry-over stocks amounting to 45,000,000 cases.

Table II.—U.S. Production of 11 Vegetables for Processing
(In tons)

Crop	Indicated 1956	1955	Average, 1945-54
Asparagus	117,500	129,400	99,800
Beans, lima	108,000	88,600	78,400
Beans, snap	328,700	305,700	250,200
Beets	191,200	144,300	143,100
Cabbage	243,500	160,700	199,100
Corn, sweet*	1,682,700	1,174,800	1,284,300
Cucumbers	329,800	311,700	262,000
Peas, green†	548,700	455,900	439,400
Pimientos	—	22,640	21,510
Spinach	138,700	130,000	119,000‡
Tomatoes	4,570,700	3,278,000	3,089,400

*Husk on.

†Shelled.

‡Average for 1949-54.

Dry Edible Peas and Beans.—The dry edible bean crop of 16,977,000 bags (of 100 lb. each) approximated the 1955 crop and was about 5% above average. Michigan, with nearly one-

third the total crop (5,522,000 bags), was the leading producing state, followed by California (3,744,000 bags) and Idaho (2,052,000 bags). Prices to producers in October averaged \$6.67 per hundredweight against \$7.04 per hundredweight a year earlier and a national average support price of \$6.31 per hundredweight. Carry-over stocks of less than 2,000,000 bags were the smallest in eight years. U.S. exports of beans during the year ending Aug. 31, 1956, were 2,226,000 bags, as compared with 1,739,000 bags in the previous year.

The northwest dry pea harvest of 4,885,000 bags was the largest since 1947, very large as compared with 2,525,000 bags in 1955 and a 10-year average of 3,868,000 bags. Prices to producers declined sharply to \$4.67 per hundredweight, as compared with \$6.41 per hundredweight a year earlier. Exports of dry peas in 1955-56 were only 408,000 bags, the smallest in 15 years and comparable to 1,200,000 bags in the previous year.

Early indications were that the bean crop of Mexico would be as large as the record high production of about 8,000,000 bags in 1954 and 1955. Nevertheless, imports exceeded exports in those years. Chile's harvest in early 1956 provided 590,000 bags for export in addition to large domestic consumption. Dry bean production in France was estimated at 2,700,000 bags, 17% larger than the 1955 crop and the largest since the 2,800,000 bags of 1939.

(See also POTATOES.)

(J. K. R.)

ENCYCLOPEDIA BRITANNICA FILMS.—*Corn Farmer* (1939); *Irrigation Farming*, 2nd ed. (1951); *Story of Potatoes* (1952); *Story of Rice* (1952); *The Truck Farmer*, 2nd ed. (1954).

Venereal Diseases. The outlook for the control of syphilis in the United States was still encouraging in 1956, although a trend downward since 1947 in the number of reported cases was reversed. More cases of primary and secondary syphilis—the most infectious stages of the disease—were reported throughout the United States than in 1955. Of a total 371,224 cases of venereal diseases reported by state and territorial health departments during 1956, the total number of cases of syphilis in all stages numbered 126,700, a significant departure from the established downward trend. In the infectious stages, 6,769 cases of primary and secondary syphilis were reported.

The incidence of syphilis in the United States is about 86,800 cases per year. It was estimated that there were more than 1,921,000 persons in the United States in 1956 requiring treatment for syphilis. These persons must be found and treated to prevent further transmission of the disease and to reduce disability and untimely death.

As of 1956, 38,000 persons were institutionalized for syphilitic insanity, and the cost of maintaining these persons was \$43,376,000 per year. Mortality data indicated that syphilis was exceeded only by the respiratory diseases and tuberculosis as the principal cause of death from infectious diseases in the United States.

The 240,819 cases of gonorrhoea reported in the United States and territories during 1956 was slightly lower than in 1955. However, the first significant increase in the nation's total number of cases reported by state health departments occurred in 1955. It was estimated that at least 1,000,000 cases of gonorrhoea occurred in the United States each year.

Other venereal diseases, chancroid, lymphogranuloma venereum and granuloma inguinale, accounted for 3,705 cases, of which chancroid comprised about two-thirds. The number of cases of these diseases was slightly less than the total of 1955.

The emphasis placed on case finding by state health departments was reflected in the number of diagnostic observations completed in public clinics during the year. Clinic personnel examined approximately 1,750,000 persons suspected of infections, and 16% or 28,000 were found to be infected. An addi-

tional 90,000 were given protective therapy, that is, treatment to halt the disease in the incubation period before the patient showed any signs or symptoms of the disease.

Interviewing patients and investigating their contacts continued as major case-finding activities of public health clinics. A total of 215,300 case-finding investigations were completed by the staffs of these clinics, and as a result 85,000 persons were given treatment. While private physicians provided diagnostic and treatment services, almost all of the interviewing of patients and investigation of their contacts were carried on by the health department clinics.

In addition, more than 2,000 venereal disease clinics in the 48 states and 4 U.S. territories provided diagnostic and treatment services to persons suspected of having a venereal infection.

Selective surveys in areas where the prevalence of syphilis was known to be high had continued; the number of states doing this type of testing had increased from 23 in 1954 to 29 in 1956, and 450,000 blood specimens were taken in 1956.

The migrant worker posed problems of venereal disease control. During 1956, of 65,000 migrant workers who were given blood tests, 7,300 reacted to the tests as being potentially in need of treatment for syphilis.

The Venereal Disease Research laboratory, Chamblee, Ga., and the Venereal Disease Experimental laboratory, Chapel Hill, N.C., provided the research, laboratory, teaching and evaluation services needed to aid the states in detecting and diagnosing venereal diseases. These two institutions helped to maintain uniformly high standards of serologic test performance, to promote use of efficient tests, to train laboratory personnel and to evaluate and interpret serologic test results. A total of 72,027 tests were performed in these laboratories on 15,679 blood and spinal fluid specimens; serologic reagents were sent to 31 state and 24 public health service laboratories. The Venereal Disease Research laboratory served as control or co-control in 21 intrastate serologic evaluation studies and one army regional laboratory study, and also served as a reference laboratory for the World Health organization. (C. A. S.)

Venezuela. The republic of Venezuela, with an area of 352,142 sq.mi., had an estimated population of 5,949,000 in 1956, not including indigenous tribes living outside of cities (which had 56,705 members in 1950). The capital is Caracas, with a population of 611,048 in 1953. The populations of the other principal cities were: (1953 est.) Maracaibo 304,313; Barquisimeto 132,123; Valencia 105,315; Maracay 77,049; San Cristóbal 64,970; Cumaná 56,604; Ciudad Bolívar 36,278; Puerto la Cruz 36,000 and Puerto Cabello 35,000.

History.—General Marcos Pérez Jiménez was president throughout 1956. Relations with other American republics were unchanged during the year. The president attended the meeting of American presidents at Panamá in July, where he proposed that the participating governments contribute to a fund for the aid of countries in economic difficulty a small percentage of their respective budgets, and offered more than \$30,000,000 on behalf of Venezuela for this purpose.

During 1956, new petroleum concessions were granted by the government, resulting in a large increase in revenue. Oil production continued at close to capacity through the year, and exploration was resumed. The production of iron ore, nearly all exported, which exceeded 8,320,000 tons in 1955, was expected to exceed 10,000,000 tons in 1956. The government's petrochemical plants were begun, and were expected to be in operation by 1957. A new pipeline was projected to Puerto Cabello. The preliminary work for the hydroelectric plant on the Caroní river, eventually expected to produce 1,000,000 kw. or more, was under way. The metallurgical plant producing more than

400,000 tons of iron and steel products was begun. In August, the president inaugurated the new water supply of Caracas, bringing to the reservoirs of the capital water from the Tuy river; the total project would cost, when finished, in excess of \$60,000,000. Progress was made on the 109 mi. railroad from Barquisimeto to Puerto Cabello, and on a short line in the east, out of the coal mines of Naricual.

Diversification of industry continued to increase the number of textile mills and other enterprises designed to cultivate the domestic market for manufactured products. Employment continued at a high level, although immigration tended to fall off, and some immigrants of earlier years returned to Europe.

The first ships went through the deepened channel of the Maracaibo bay in May, and it was hoped that the entire task would be completed early in 1957. The oil companies purchased \$13,000,000 of 4.5% bonds of the commission which had the task in hand. Plans for the construction of a bridge over the entrance to Lake Maracaibo were studied and bids invited. The program of active development of the network of roads connecting the southern end of the lake with Colombia and the inland states of Venezuela was carried forward.

The total direct and guaranteed public debt at the end of the fiscal year (June 30) amounted to \$187,000,000; to which must be added floating debt incurred by the several autonomous agencies, with a debt service of approximately \$13,000,000; this floating debt was expected to be funded. There were also foreign dollar obligations arising from the Tuy water project (about \$30,000,000), the metallurgical plant project (\$157,577,573), and housing loans of the Export-Import Bank of Washington, reduced by 1956 to \$4,457,639. These three sets of foreign dollar loans were made to autonomous agencies, but were guaranteed by the Venezuelan government.

(See also FOREIGN INVESTMENTS; ORGANIZATION OF AMERICAN STATES.) (C. E. Mc.)

Education.—At the end of 1954 there were 7,014 primary schools, public and private, with 608,976 pupils and 16,944 teachers, and 197 secondary and special schools with 33,481 students. University education was available at three public and two private universities with total attendance of 7,645 in 1954. Education was allotted 6.4% of the 1956-57 budget. According to the 1950 census, 48.7% of those 10 years of age and over were illiterate.

Finance.—The monetary unit is the bolívar, valued at 29.85 cents U.S. currency during 1956. The 1956-57 budget (July 1-June 30) was balanced initially at Bs. 2,670,000,000. There was no external debt; the total government and government-guaranteed debt was Bs. 496,532,000 on Dec. 31, 1954. Currency in circulation (May 31, 1956) totalled Bs. 942,000,000; demand deposits, Bs. 1,436,000,000. The U.S. department of commerce estimated U.S. direct private investments in 1955 at \$1,424,000,000, of which petroleum investments accounted for \$1,056,000,000. The cost-of-living index (Caracas) stood at 101 in May 1956 (1953=100).

Trade and Communications.—Exports in 1955 totalled Bs. 6,408,674,615; imports, Bs. 2,959,633,695. Chief exports were crude petroleum and petroleum products (94%), iron ore (3%) and coffee (2%); leading imports, machinery, instruments and apparatus (33%), metals and manufactures (18%), foodstuffs and beverages (15%), chemicals and drugs (5%) and textiles (5%). Leading suppliers were the U.S. (about 60%), Germany, the U.K., Canada and France; leading customers, the Netherlands Antilles, the U.S. and Canada.

Public railways (1955) totalled about 544 mi. divided among a number of disconnected lines of varying gauges. In 1953 there were 10,243 mi. of all-weather roads and in Sept. 1955, 120,000 passenger cars and 86,000 commercial vehicles. Airlines carried 661,870 passengers within Venezuela in 1955. According to *Lloyd's Register of Shipping*, the merchant marine had 94 vessels (100 tons and over) aggregating 216,264 gross tons on June 30, 1955. Telephones (Jan. 1, 1955) numbered 97,982.

Agriculture.—Production estimates for the 1955-56 crop year (preliminary figures) included coffee 720,000 bags of 132 lb. each; cacao 39,000,000 lb.; maize (1954-55) 330,000 metric tons. In 1955, 144,046 metric tons of sugar, 26,799 tons of rice (milled), 1,091 tons of cotton and 11,629,000 lb. of tobacco were produced and 628,000 bags of coffee were exported. According to U.S. department of agriculture estimates, there were 6,100,000 cattle in 1955.

Manufactures.—Production estimates for 1955 included cement 1,282,295 metric tons; soap 16,354 tons; cigarettes 3,277,724,000 units; tires 417,204 units; beer 146,935,000 l.; cotton cloth 16,242,836 m. Installed electric energy capacity totalled 500,000 kw. on Dec. 31, 1955; production for public use (1955) was 1,151,000,000 kw.hr.

Minerals.—Production of crude petroleum in 1955 totalled 787,382,000 bbl.; natural gas, 24,308,061,000 cu.m. Crude petroleum exports totalled 590,815,000 bbl.; refinery throughput, 195,900,000 bbl.; exports of refined products, 147,800,000 bbl. At the end of 1955 proven reserves totalled 12,435,000,000 bbl. Production of other minerals in 1955 included iron ore (metal content 65%) 8,439,451 metric tons; gold 61,000 troy

diamonds 141,147 carats; coal 30,476 tons.
See Alfred P. Jankus and Neil M. Malloy, *Venezuela: Land of Opportunity* (New York, 1956).
ENCYCLOPÆDIA BRITANNICA FILMS.—*Colombia and Venezuela* (1945); *Venezuela* (1955).

Vermont. A north Atlantic state of the United States, the only one of the New England states without a seacoast. Vermont is popularly known as the "Green Mountain State"; it was admitted to the union in 1791. Area: 9,609 sq.mi., of which 331 sq.mi. are water. Population (1950) 377,747 (including 240,135 rural, 137,612 urban; 348,435 native white, 443 Negro, 28,753 foreign born). The U.S. bureau of the census estimated the population of the state to be 370,000 as of July 1, 1956. The chief cities are Montpelier (cap., pop., 1950 census) 8,599, Burlington 33,155 and Rutland 17,659.

History.—The general assembly did not meet in 1956. Gov. Joseph B. Johnson in Plainfield, N.J., on July 4, 1956, led the dedication of a memorial marker, financed from funds provided by the Vermont legislature, placed on the grave of Civil War hero and artist, Julian A. Scott, first Vermonter to receive the Congressional Medal of Honor. On Aug. 15, a plaque of Barre granite was placed on Scott's painting of the "Battle of Cedar Creek" in the reception room of the Vermont state house in Montpelier.

A log cabin in Grand Isle, believed to be the oldest in the state, built in 1783 by Jedediah Hyde, a soldier of the Revolution, property of the Vermont Historic Sites commission, was transferred to the Grand Isle Historical society, formally opened as a public shrine, and dedicated on July 17.

The Historic Sites commission also, on July 27, erected a roadside marker in Pittsford Village Green to mark the granting of the first U.S. patent, which was signed by George Washington, and issued in 1790 to Samuel Hopkins, native of Pittsford, then stopping in Philadelphia, Pa., for his "new and improved" method of making potash.

The Strafford Historical society, Aug. 12, co-operating with the Vermont Historic Sites commission, unveiled an official state site marker in Strafford at the birthplace of U.S. Senator Justin Smith Morrill, author of the Morrill (Land-Grant College) act, signed by Abraham Lincoln in 1862.

Chief state officers elected Nov. 6, 1956, to take office in Jan. 1957 were: George D. Aiken, U.S. senator; Winston L. Prouty, U.S. representative to congress; Joseph B. Johnson, governor; Robert T. Stafford, lieutenant governor; George H. Amidon, state treasurer; Howard E. Armstrong, secretary of state; David V. Anderson, auditor of accounts; Frederick M. Reed, attorney general. The Dwight D. Eisenhower-Richard M. Nixon ticket received 72.2% of the presidential vote in Vermont, compared with 71.5% in 1952.

Education.—The number of elementary schools in the state on June 30, 1955, was 614. The elementary school enrolment in 1955-56 was 52,394 and the teaching staff 2,056. There were 81 public high schools in the state in 1954-55. The enrolment in these high schools in 1955-56 was 18,786 and the teaching staff 871. Total current expenditures for education, exclusive of capital outlay, were \$16,676,249.55, of which \$3,505,396.94 (21%) was paid by the state to the local school districts for general state aid. Aid approved by the 1953 and 1955 general assemblies to local school districts for the construction and alteration of buildings, for constructions started since July 1, 1947, by June 30, 1956, had reached a total of \$4,117,855.10. The state superintendent of schools was the commissioner of education, A. John Holden.

Social Insurance and Assistance, Public Welfare and Related Programs.—Relief in general was administered by the overseer of the poor in each town. An average number of 6,823 persons a month received old-age assistance from state funds amounting to \$3,965,349.09 during the year ended June 30, 1956. Aid to dependent children was distributed to an average number of 1,182 recipients monthly, from funds amounting to \$928,052.06. Blind assistance funds amounting to \$87,434 were distributed to about 161 persons a month. Aid to the disabled was paid to about 531 persons a month, and amounted to \$298,597.50.

Unemployment compensation payments made under the Vermont law numbered 87,808 and amounted to \$1,917,148 for the year ended June 30, 1956. The three state correctional institutions during the year ended June 30, 1956, had an average 417 inmates; their total expenses were \$826,555.72.

Communications.—The total mileage of the public highway system (state, state-aid and town highways) as of June 30, 1956, was 13,715 of which

1,914 mi. were in the state system and 2,733 mi. in the state-aid system. Total expenditures during the fiscal year ended June 30, 1956, amounted to \$16,649,449.15. There were 853.3 mi. of railways in the state in the year ended Dec. 31, 1955; telephone subscribers were estimated at 82,500. Airports numbered 20, seaplane landing area 1 and airways 4, with a total mileage of about 300 during the year ended June 30, 1956 (official Civil Aeronautics administration figure of 250 mi., to which was added 50 mi. for the airway established between Montpelier and Newport in 1955).

Banking and Finance.—The number of state and national banks as of June 30, 1956, was 71 of which 37 were state banks with total deposits of \$271,711,394.23. The seven state co-operative building, savings and loan associations had assets of \$6,183,272.88.

Total receipts of the state as of June 30, 1956, were \$51,856,738.07; total disbursements \$55,217,599.91; there was no unappropriated surplus but rather a deficit of \$1,163,828.80; total debt outstanding \$6,626,000.

Agriculture.—Vermont cash receipts from farm marketing for the year 1955, according to the agricultural marketing service of the U.S. department of agriculture, totalled \$108,500,000 compared with \$103,800,000 in 1954.

Cool weather at blossom time in 1956 limited bee activity, affecting the pollination of apples, which blossomed late, according to the U.S. agricultural marketing service. Corn was slow in starting, but indicated production, while below that of 1955, was well above average. Cold weather also limited the growth of the potato crop.

Honey produced in Vermont in 1955 amounted to 410,000 lb., compared with 506,000 lb. in 1954.

There were 469,000 head of cattle on Vermont farms Jan. 1, 1956, of which 326,000 were cows and heifers kept for milk production, compared with 474,000 head in 1955, of which 317,000 were kept for milk production. There were 109,000 turkeys raised on Vermont farms in 1956, compared with 115,000 in 1955.

Table I.—Principal Crops of Vermont

Crop	Indicated 1956	1955	Average, 1945-54
Corn, bu.	2,989,000	3,224,000	2,738,000
Hay, tons	1,133,000	1,197,000	1,310,000
Apples, commercial, bu.	580,000	1,100,000	782,000
Oats, bu.	432,000	490,000	895,000
Potatoes, cwt.	390,000	465,000	596,000
Maple syrup, gal.	623,000	673,000	661,000

Source: U.S. Department of Agriculture.

Manufacturing.—The Vermont unemployment compensation commission reported for the year ended June 30, 1956, an average of 35,062 persons a month in manufacturing industries covered by the state unemployment compensation law (all industries 63,030); wages paid to such workers in manufacturing industries \$126,579,040 (all industries \$214,908,645). (C. E. FE.)

Table II.—Principal Industries of Vermont

Industry	All employees 1954	Salaries and wages 1954 (in 000s)	Value added by manufacture 1954 (in 000s)	Value added by manufacture 1953 (in 000s)
Textile mill products	2,279	\$ 7,297	\$ 7,581	\$ *
Paper and allied products	1,959	8,122	14,363	12,939
Stone, clay and glass products	4,191	14,670	21,804	21,926
Machinery (except electrical)	7,811	34,012	63,727	84,946

*Withheld because the estimate did not meet publication standards, either on the basis of the associated standard error of estimate or on the basis of a consistency review.
Source: U.S. Department of Commerce, 1954 Census of Manufacturers, preliminary report.

Table III.—Mineral Production of Vermont
(In short tons)

Mineral	Quantity 1953	Value 1953	Quantity 1954	Value 1954
Total	4,000	\$20,302,000	4,000	\$20,483,000
Copper	?	2,266,000	?	2,568,000
Lime	?	690,000	1,482,000	1,111,000
Sand and gravel	1,114,000	8,860,000	437,000	8,178,000
Stone	527,000	241,000	66,000	199,000
Talc	80,000	8,245,000	...	8,427,000
Other minerals . . . . .	...	...	...	...

*Value included with other minerals.
Source: U.S. Bureau of Mines.

Mineral Production.—Table III shows the tonnage and value of those mineral commodities produced in Vermont in 1953 and 1954 whose value exceeded \$100,000. In 1954 Vermont was first among the states in the production of asbestos and slate, fourth in talc and fifth in pyrite, and ranked 40th in the value of its mineral output, with 0.15% of the U.S. total.

ENCYCLOPÆDIA BRITANNICA FILMS.—*Northeastern States*, 2nd ed. (1955); *Vermont* (1955).

Veterans Administration (U.S.). Benefits for the nation's 22,510,000 veterans and their families are administered by the Veterans administration, an independent agency of the United States government. Nearly 70% of all veterans, or 15,361,000, served in World War II; 4,853,000 served during the Korean conflict, of whom 872,000 also were World War II veterans; 3,040,000 saw

service during World War I and the other 128,000 were veterans of earlier wars and of peacetime service.

Veterans' Training.—During 1956, one veterans' training program reached its end, while another climbed to what probably was its peak. The World War II G.I. bill ended for virtually all veterans on July 25, 1956. During the 12 years it had been in effect, more than 7,800,000 World War II veterans, or one-half of all who served in World War II, received educational benefits. Of the total, 2,200,000 attended college, 3,500,000 went to schools below the college level, 1,400,000 took on-the-job training and 700,000 enrolled in institutional on-the-farm training. The total cost of the program was \$14,500,000,000, with 80% of the money paid directly to veterans in the form of monthly subsistence allowances. Most of the remainder was paid to schools and colleges for tuition, books and supplies. Only five cents out of every dollar was spent for administration of the program.

At the close of 1956 only a handful of veterans were still eligible for World War II G.I. bill training—those who enlisted under the Armed Forces Voluntary Recruitment act in 1945 and 1946. They had nine years from the end of their enlistment period to complete their G.I. courses.

The Korean G.I. bill, in effect since Aug. 20, 1952, probably reached its peak at the end of 1956, with 750,000 young veterans in training; 60% were enrolled in colleges and universities and the rest were training in schools below the college level, on-the-job and on-the-farm. The Korean G.I. bill program was expected to come to an end about 1965. Cumulatively, more than 1,600,000 Korea veterans, or one out of every three who served during the Korean conflict, had received training during the four years the program had been in effect.

Veterans training under the Korean G.I. bill received a government allowance covering each month of training. Rates for veterans in school full time were \$110 if they had no dependents; \$135 with one dependent; and \$160 with more than one dependent. Rates for part-time training, as well as on-the-job and on-the-farm training, were lower. Veterans might be entitled to one and one-half days of G.I. training for each day of military service during the Korean conflict period, up to a maximum of 36 months at school.

Vocational Training for the Disabled.—Special vocational rehabilitation training is available to service-disabled veterans of the Korean conflict. While in training and for two months afterward, they may receive a subsistence allowance from the government, in addition to their monthly disability compensation payments. By the end of 1956, a total of 42,000 veterans had received rehabilitation training under this program. A Veterans administration study disclosed that 40% had trained for occupations in the professions and managerial field, 33% in the skilled trades, and the rest in a variety of other fields.

Another vocational training program, for disabled World War II veterans, virtually ended on July 25, 1956; only certain "hardship" cases still were permitted to pursue their training. Under this 13-year-old program, 610,000 disabled veterans were given the opportunity to overcome their handicaps through training, so that they might learn to lead self-sufficient, productive lives.

War Orphans Schooling.—A new educational program was authorized by congress in the summer of 1956. This was not for veterans, but for sons and daughters of deceased war veterans who died of service-connected conditions. Young men and women generally must be between the ages of 18 and 23 to receive the 36 months of schooling to which they are entitled by law. While in school, they may receive a monthly allowance of \$110 if enrolled full-time; \$80 if three-quarters time, and \$50 if half-time. As a rule, education must be taken in a college or

university; below-college-level schooling is permitted, however, if it leads to a definite vocational goal. Job training and farm training are prohibited.

About 150,000 young men and women were expected to be eligible for the War Orphans education program.

Medical and Hospital Benefits.—At the close of 1956, VA was operating a network of 173 hospitals for the treatment of ill and disabled veterans. It also was utilizing some beds in civil, state and other federal hospitals on a contract basis. At that time, a total of nearly 114,000 veterans were receiving VA hospital care. More than half were being treated for mental illness.

War veterans, including those with service during the Korean conflict period, are entitled to VA hospitalization under the following priority system authorized by law: first, the service-connected, those suffering from injuries or diseases incurred in or aggravated by wartime military service; and second, those with nonservice-connected ailments who state under oath that they are unable to pay for private treatment. Veterans in the latter group must submit a financial statement listing assets and liabilities, and must wait until beds are available for them.

During 1956, congress authorized a \$10,000,000 appropriation for an intensified VA medical research program. Most of the increased research was to be directed in the areas of mental and nervous diseases, heart and artery diseases, cancer and leukemia, and problems of the aging.

G.I. Loans.—The G.I. loan program was extended another year for World War II veterans, under a law passed by congress in the summer of 1956. The original deadline called for World War II veterans to complete all G.I. loan arrangements by July 25, 1957. The new law allowed them until July 25, 1958, to apply for G.I. loans, and up to a year afterward to close their deals. The G.I. loan deadline for Korea veterans remained unchanged at Jan. 31, 1965.

Another provision of the new law allowed G.I. homeowners to be relieved from liability to the government if they sold their homes and permitted the buyers to assume their G.I. loans. Previously, the veterans themselves continued to be liable for payment of the loan, even though payments were being made by the purchasers of their homes. For a veteran to be relieved of liability, the purchaser must assume full liability on the loan, the VA must approve him from a credit standpoint and the loan must be current. Cumulatively, about 5,000,000 World War II and Korea veterans had obtained G.I. loans for homes, farms and businesses by the end of 1956. The total value of the loans approached \$40,000,000,000, while VA's guaranteed portion exceeded \$20,000,000,000. Ninety per cent of all loans were for the purchase of homes.

Insurance.—During the year, VA was administering three systems of G.I. insurance: U.S. Government Life insurance for World War I veterans; National Service Life insurance for World War II veterans; and the Indemnity and Insurance acts of 1951 for Korea veterans.

When the year drew to a close, more than 5,300,000 World War II veterans were holding National Service Life Insurance policies; 370,000 World War I veterans held U.S. Government Life policies; and 600,000 Korea veterans had obtained Korean G.I. term insurance policies.

Under the Survivor Benefits act, passed by congress during the year, the automatic servicemen's indemnity against death in active service, sometimes called "free insurance," ended Dec. 31, 1956. The indemnity was replaced by liberalized benefits for survivors of those who might die after Jan. 1, 1957, as a result of service.

Also ended on Dec. 31, 1956, was the right of Korea veterans to obtain Korean G.I. term insurance. Disabled Korea veterans, however, still might apply for special policies available to them.

Compensation and Pension.—Veterans with service-connected disabilities resulting either from wartime or peacetime service may qualify for monthly compensation payments from VA. Rates range from \$17 to \$181 for wartime service; peacetime veterans receive 80% of these amounts. Additional statutory awards are payable to veterans with certain severe disabilities such as blindness and amputations.

Pensions are paid to veterans of World War I, World War II or the Korean conflict, who are totally and permanently disabled for reasons not connected with their service and whose annual incomes do not exceed \$1,400 if single or \$2,700 if married or with a minor child. Rates are \$66.15 a month, increased to \$78.75 after ten years or when the veteran reaches age 65. Those who need constant aid and attendance may get \$135.45 a month. At the end of 1956, more than 2,700,000 veterans were receiving disability compensation and pensions. Included were nearly 200,000 veterans disabled since the Korean conflict.

Other benefits.—VA administers a number of other benefits for veterans and their dependents. Among these are programs providing cars for the seriously disabled, "wheelchair housing" grants for other disabled veterans, a guardianship service, a program of death benefits and still others.

(See also BUDGET, NATIONAL.)

(H. V. H.)

Veterans' Organizations, U.S. Total membership in 1956 for major veterans' organizations was reported at 4,500,000, about 300,000 less than the previous year.

American Legion.—The American Legion's 38th annual convention, held in Los Angeles, Calif., elected W. C. "Dan" Daniel of Danville, Va., as national commander, to replace J. Addington Wagner of Battle Creek, Mich. The Legion reported its membership at approximately 2,800,000.

The organization's national headquarters are at Indianapolis, Ind. Its official publication is the *American Legion Monthly*. Although the organization's primary emphasis is on veterans' benefits, it was also concerned during 1956 with its "New Glory for Old Glory" campaign, increased display of the United States flag as the symbol of liberty, and its "back to God" program designed to help reaffirm traditional moral and spiritual values.

Veterans of Foreign Wars.—The V.F.W.'s 57th national encampment was held in Dallas, Tex., in Aug. 1956. Cooper T. Holt of Chattanooga, Tenn., was elected national commander, to succeed Timothy J. Murphy of Boston, Mass. At 32, Commander Holt was the youngest V.F.W. commander in its history. The organization reported an increase of membership to 1,300,000, or about 100,000 more than the previous year. Objectives of the V.F.W. continued to be: to expand Veterans administration hospital and medical programs; to strengthen veteran preference in federal employment; to adopt universal military training; to concern itself with the construction of highways, schools, hospitals and other projects in the public interest; to use vigilance in combating communist infiltration and subversion in all areas of American life.

Disabled American Veterans.—This group is devoted exclusively to the care of the war disabled, whether or not they are members of the D.A.V. In 1956 it reported a life membership of more than 70,000 and a total membership of 210,000. At its 1956 convention, held in San Antonio, Tex., Joseph F. Burke, World War II amputee, was elected national commander. The D.A.V.'s traditional national program is one of "advancing the interests of America's war disabled and their dependents."

American Veterans of World War II and Korea (Amvets).—The 1956 convention of Amvets was held in Milwaukee, Wis., in August. Domenick L. Strada of West New York, N.J., was elected commander, to replace Rudy Pesata of Berwyn, Ill. Mem-

bership was reported at 130,000. Amvets continued its policy, through resolutions passed at the 1956 meeting, of support of the United Nations and of recommendations that court-marital board hearings be liberalized by the addition of qualified psychiatrists and former prisoners of war to help in decisions. Amvets is the largest of veteran groups organized since World War II.

American Veterans Committee.—A.V.C. reported its 1956 membership at about 25,000. Mickey Levine of Yonkers, N.Y., was elected chairman, to replace Bill Mauldin, at the 10th annual convention held in Atlantic City, N.J.

A.V.C.'s slogan is "Citizens First, Veterans Second," and its major themes include active concern for civil liberties and civil rights in the United States and for international co-operation.

Other Organizations.—Among the 30 or more veterans' or veteran-related organizations active in the United States in 1956 were the Catholic War Veterans of the United States with a membership of 217,000 and the Jewish War Veterans of the United States of America with a membership of 100,000. The latter reported that it was now the oldest active veterans' organization in the United States since the death in 1956 of the last member of the G.A.R.

The World Veterans federation increased its membership in 1956 to 19,000,000, representing 136 organizations in 35 countries. The 1956 convention was held in Brussels, Belg., in May. United States groups associated with the World Veterans federation were the Amvets, the American Veterans committee, the Blinded Veterans association, the Disabled American Veterans, the Military Order of the Purple Heart and the Paralyzed Veterans association. The W.V.F.'s 1955 convention was held in Copenhagen, Den. Among major resolutions adopted were those urging the great powers of the world to create a pattern of international co-operation in the use of nuclear energy; urging the four leading powers to abstain from violent means in settling disputes; to include Asian representation in the United Nations Security council; to continue and extend UN technical assistance to underdeveloped countries; to continue the W.V.F.'s unalterable opposition to discrimination on grounds of race, religion or national origin.

(Mo. Pr.)

Veterinary Medicine. During 1956, federal officials succeeded in preventing the entrance into the United States of any important infectious disease of animals. However, to increase the vigilance against all exotic diseases, veterinary officials of the agricultural research service, U.S. department of agriculture, sponsored six regional meetings throughout the nation to discuss means of recognizing and controlling dangerous foreign diseases such as rinderpest, African swine fever and fowl plague, should they appear. More than 1,000 veterinarians, including federal and state officials and practitioners, attended.

Vesicular Stomatitis.—This least known of three similar blister-forming virus diseases of animals affects horses, cattle and hogs. Unlike foot-and-mouth disease (aftosa) and vesicular exanthema of swine, both of which are extremely contagious, vesicular stomatitis seems to be spread only by biting insects. Investigation in Georgia, where it had reappeared each summer in recent years, revealed evidence of infection in a high percentage of raccoons, deer and feral (wild) swine. These, and possibly other animals, may act as reservoirs for the disease.

Leptospirosis.—This widespread disease which affects many species of animals, including man, is caused by a spirochaete, a small spiral organism that thrives in water. There are several species of leptospira, each especially infective for certain species of animals. Affected calves often die in a day or two but the disease usually takes a chronic form in older cattle. Abortion frequently results and this may be the only symptom noticed. In

the state of Washington, 12% of 34,718 cattle tested showed evidence of present or past infection. Ponds and streams used for drinking water and muddy corrals seemed to be important factors in spreading the disease.

Swine seldom show any symptoms except abortion. In most species, including the dog, the kidneys frequently become chronically infected. This explains the difficulty in controlling the disease since animals which appear to be healthy may be spreading organisms in their urine. Satisfactory vaccines were produced for cattle and hogs. Some antibiotics were effective in clearing up chronic infection of the kidneys. Rodents seemed to be the chief source of infection in man.

Erysipelas.—This bacterial disease, which is most destructive in swine and turkeys, also affects man and sheep and has occasionally been diagnosed in cattle, chickens, pheasants and other species. Fish are not susceptible, but acute erysipelas had recently caused the death of four captive porpoises (sea-going mammals) in Marineland, Fla. This may explain why the germ is often found on fish, resulting in frequent local infections (erysipeloid) of the hands of fishermen. Apparently this germ lives in the sea as well as in the soil of many lands.

Hog Cholera.—Steps were recently taken which it was hoped might eventually lead to the eradication of this highly contagious, fatal disease of swine. Except for contact with affected swine, the only known sources of infection were the virulent virus which had long been used with immune serum in vaccination, and the virus which may persist in uncooked garbage. Most states require that all garbage fed to swine be sterilized by cooking. Furthermore, since the early 1950s modified and killed virus vaccines, neither of which could cause cholera, had replaced virulent virus in 80% of pig vaccinations. Several southeastern states had banned the use of virulent virus, and recently a national movement was inaugurated to ban its use in all states. Therefore, unless the virus could live in some wild species or some lower forms of animals, the eventual eradication of this costly swine disease seemed possible.

The Mucosal Disease Complex.—In recent years several new diseases of cattle had appeared, each affecting chiefly the mucous membranes of some organs. Two diseases, upper respiratory disease of California and necrotic rhinotracheitis of Colorado, were found to be caused by a single virus. The name infectious bovine rhinotracheitis was proposed for this disease.

The other diseases in this group affect mainly the digestive tract. They are transmissible, but the causative agents had not been isolated. One form, mucosal disease (Iowa variety), usually affects only a few animals in a herd, but 90% of these may die. Virus diarrhoea (New York or Indiana variety) is quite contagious, but most affected animals survive. These diseases had been reported from about half of the states, from Canada and recently from Great Britain.

Poisonings.—Ergot poisoning, once common in man and animals, had rarely been reported in recent years. The chronic form results in drying and sloughing of the extremities. A similar condition in cattle, called fescue lameness, was reported in Colorado and Kentucky after about 1952. Tests revealed that ergot alkaloids, in an unusual form, were present on the incriminated mature fescue grass.

Cornstalks poisoning, believed by some to be due to excessive nitrites or nitrates in the dried plants, killed many cattle in Missouri, Wisconsin and other drought-stricken states in the fall of 1955. Other cattle in Missouri were reported to have been poisoned by eating smut, the black fungus on corn.

Other reported poisonings were caused by: bracken fern (cattle); coal tar and clay pigeons (pigs); lead paint (calves); lead absorbed from a swallowed drapery weight (a dog); benzene hexachloride (a horse); arsenic solution which leaked from a con-

tainer onto the feed (milk cows); and sedative pills carelessly exposed (a pup).

Chlorpromazine.—This tranquilizing agent was reported to have been effective in correcting nervousness and aggressiveness in dogs and horses, as a preanaesthetic sedative and in preventing restlessness during recovery from anaesthesia. It also seemed to relieve vomiting in dogs. A horse with tetanus was given chlorpromazine injections daily for seven days, producing sufficient relaxation to allow it to eat and drink and to prevent fatal exhaustion from involuntary tenseness.

Distemper Immunity.—Many methods had been used for vaccinating dogs for distemper, but none seemed fully satisfactory. It was demonstrated that regardless of the method used the immunity was seldom permanent unless periodically boosted by exposure or by revaccination.

(See also AGRICULTURAL RESEARCH SERVICE; BACTERIOLOGY.)
(W. A. A.)

Vietnam. A country forming the easternmost part of the Indo-chinese peninsula. Until World War II it was divided into two French colonies and the French protectorate of Annam. After an eight-year war, civil, local and international at the same time, on July 21, 1954, Vietnam was *de facto* divided into two independent republics. Areas and populations are:

	Area (sq. mi.) 1955 (est.)	Population 1955 (est.)
Republic of Vietnam (south)	65,726	11,500,000
Democratic Republic of Vietnam (north)	63,360	12,500,000

Three-quarters of the total population live on coastal plains, i.e., on 10% of the total territory, the Makong delta (south Vietnam) and the Red river delta (north Vietnam) being among the world's most densely populated areas. Religion: mainly Confucian, with three sects (Cao-Dai, Hoa-Hao and Binh-Xuyen) and a Roman Catholic minority.

Republic of Vietnam.—This comprises the former French colony of Cochinchina and the southern part of the empire of Annam with its old capital Hué. It is bounded on the north by the Democratic Republic of Vietnam (along the 17th parallel), on the west by Laos, Cambodia and the Gulf of Siam, and on the southeast and east by the South China sea. Chief towns (pop. 1953 est.): Saigon (cap.), including the port of Cholon, 1,614,200; Hué 96,388; Tourane 57,395. President of the republic and premier in 1956, Ngo Dinh Diem.

Democratic Republic of Vietnam.—This comprises the former



VIETNAMESE CHILDREN opening gift boxes collected by the Junior American Red Cross in 1956

French colony of Tongking and the northern part of the empire of Annam. It is bounded on the north by China, on the west by Laos, on the south by the Republic of Vietnam and on the east by the South China sea. Chief towns (pop. 1953 est.): Hanoi (cap.) 297,900, Haiphong (chief port) 188,600. President of the republic in 1956 and first secretary of the Lao Dong (Communist) party, Ho Chi Minh; chairman of the council of ministers, Pham Van Dong.

History.—*Republic of Vietnam.*—President Diem withdrew his country's representatives from the assembly of the French Union. On July 21, 1956, the post of French high commissioner was abolished and Jean Payart was accredited French ambassador to Vietnam.

In the elections held on March 4, Diem's party, the National Revolution movement, won 66 out of 123 seats, with 99% of the electorate voting. The constituent assembly adopted on July 7 the new constitution. The president of the republic, elected by direct popular vote for a six-year term, was to be the head of government; the parliamentary control was to be exercised by the legislative assembly, whose deputies were to be elected for four-year terms.

The forces of the rebelling sects were defeated and Gen. Le Quang Vinh, who fought the government for 18 months under the name of Bacut, leader of the Hoa-Hao, was captured and executed (July 12). In central Vietnam strong measures were taken against communist agitation. Trade with Cambodia was suspended. On Aug. 27 a naval unit hoisted the Vietnamese flag in the Spratly Islands, to which both China and the Philippine Republic laid claim.

The economic situation was marked by a considerable fall in exports. The instability of the currency and the atmosphere of political uncertainty discouraged the export of rice, the country's principal product; and the fall in the price of rubber was another cause of despondency. Imports from France were also reduced (from 68% of the total to 27%), though France remained the leading supplier, followed by the United States, Japan and Germany. France was by far the leading customer country (71%).

An agreement signed on May 8 between the United Kingdom and the U.S.S.R., the co-chairmen of the 1954 Geneva conference on Indochina, authorized the postponement of the general elections that were to reunify the two Vietnams; and, consequently, the maintenance in being of the armistice commission composed of the representatives of Canada, India and Poland. It was, of course, idle to imagine joint elections while the northern regime was communist and the southern staunchly anticommunist. In April more than 100,000 French troops under Gen. Pierre Jacquot left Saigon. The national Vietnamese army had been cut by 50,000 to about 200,000 men. (Hu. DE.)

Democratic Republic of Vietnam.—On April 2 the first vice-chairman of the Soviet council of ministers, A. I. Mikoyan, arrived at Hanoi. The following day, addressing a meeting of 150,000 people, he insisted on the necessity of a peaceful reunification of Vietnam and expressed the hope that none of the states of the former Indochina would join the "aggressive" Southeast Asia Treaty organization.

It was believed that between July 1954 and June 1956 the army of the Democratic republic had grown from 7 to 20 divisions totalling about 350,000 men. On June 21, however, the north Vietnamese government announced the reduction of the size of its army by 80,000 men. (X.)

Foreign Trade.—*Republic of Vietnam:* Monetary unit: 1 Vietnamese piastre = 10 metropolitan French francs, U.S. \$1 = 350 metropolitan francs. Note circulation 11,000,000 piastres. Imports 92,000,000 fr., including 46,000,000 fr. from France. Exports 24,000,000 fr., including 7,600,000 fr. to France, 5,600,000 fr. to the U.S. Principal exports: rubber 14,000,000 fr., rice 3,000,000 fr.



HORSE-DRAWN CAISSON carrying the body of Sen. Harley M. Kilgore of West Virginia through Arlington, Va., for burial in the national cemetery. Kilgore died Feb. 28, 1956; as a veteran of World War I and a member of the West Virginia national guard, he was given full military honours

Virginia. One of the 13 original states of the United States, Virginia was admitted to the union June 26, 1788. It is known as the "Old Dominion" and the "Mother of Presidents." Its development dates from 1607, when the first permanent English settlement in the new world was established at Jamestown. The event was to be commemorated in 1957 by state and federal commissions planning a year-long 350th anniversary celebration centred at restored sections of Jamestown, at Williamsburg, the second capital, and at Yorktown.

Southernmost among the middle Atlantic states, Virginia has an area of 40,815 sq.mi., including 922 sq.mi. of water. Pop. (July 1, 1956, est.) was 3,651,000; 1950 census 3,318,680. Principal urban areas include Richmond, pop. (1950) 230,310; Norfolk, 213,513; Arlington county, 135,449; Roanoke, 91,921, and Portsmouth, 80,039. Farm population dropped from 983,746 or 36.7% in 1940 to 732,000 or 22.2% in 1950. Since that time, the trend from a rural, agricultural economy to an urban, industrialized one has continued at a steady pace.

History.—During 1956 a regular and a special session of the general assembly, as well as a constitutional convention, were held in Richmond as the state struggled to devise some lawful means to continue public education on a racially segregated basis. The regular session of the legislature appropriated \$62,000,000 as the initial phase of a projected \$109,000,000 building program to meet the deferred capital needs of state agencies and institutions. It also amended the state's tax laws to move payment deadlines forward and thus collect taxes for two calendar years in fiscal 1957. This move was calculated to provide a one-time "windfall" of about \$40,000,000 to help get the capital expansion program under way.

Both the constitutional convention and the special legislative session were called to deal with the school segregation issue. The convention changed the state's basic law to permit the payment of public funds as private school tuition grants to parents unwilling to send their children to mixed public schools. The legislature passed about 30 school laws, including measures to withhold state funds from localities that integrate their schools, laws to permit the governor to operate schools at his own discretion on an emergency basis, provisions for assigning pupils to classes through a central assignment board and acts to authorize public grants for private tuition where schools cease to function. Appeals from lawsuits already adjudicated in favour of Negro plaintiffs seeking desegregation injunctions promised to put the new laws to an early test.

In the November general elections, Virginia's 12 electoral votes were won by Pres. Dwight D. Eisenhower, who carried nine of the state's ten congressional districts. All incumbent congressmen, eight Democrats and two Republicans, were returned to the house of representatives. Principal state officials, all of whose terms were to expire in Jan. 1958, were governor, Thomas Bahn-

son Stanley; lieutenant governor, A. E. S. Stephens; and attorney general, J. Lindsay Almond, Jr.

Education.—In 1955-56 elementary school enrolment was 553,319, including 411,698 whites and 141,621 Negroes. Secondary enrolment was 199,756, made up of 153,120 whites and 46,636 Negroes. The elementary school teaching staff included 16,341 positions, the secondary and vocational staff 9,163 positions. In addition, there were 2,404 principals, head teachers and supervisors. Dowell J. Howard was state superintendent of public instruction.

Social Insurance and Assistance, Public Welfare and Related Programs.—For the year ended June 30, 1956, general relief payments went to 9,560 persons and totalled \$1,020,963; old-age assistance payments amounting to \$6,245,380 went to 20,047 persons; 13,001 families with 39,248 dependent children received \$7,067,263; the foster care program provided \$1,805,371 for 7,252 children; 6,412 totally and permanently disabled persons were paid \$2,267,089; and 1,499 blind persons got \$583,133. For the first 10 months of 1956 unemployment compensation payments totalling \$7,561,560 were disbursed in 411,789 weekly payments. Average daily population of six penal institutions for adults was 5,924 and of four industrial schools for juveniles 798 at the close of the fiscal year June 30, 1956.

Communications.—As of June 30, 1956, Virginia had 7,938.75 mi. of primary highways and 40,980.26 mi. of secondary roads. During the June 30, 1956, fiscal year, the state spent \$102,348,568 for construction, maintenance and operation of its highway systems, compared with \$90,216,792 for this purpose in the preceding 12-month period. Total railway mileage in the state on Jan. 1, 1956, was 4,108.09. The 1,000,000th telephone to be put into commercial use in Virginia was installed Nov. 14, 1956.

Banking and Finance.—On June 30, 1956, Virginia had 183 state banks with deposits of \$1,107,129,531 and assets of \$1,219,369,852. As of the same date, 131 national banks in the state had deposits of \$1,482,962,515 and assets of 1,625,896,242. Resources on Dec. 31, 1955, of 20 industrial loan associations were \$35,879,383; of 42 building and loan associations, \$118,502,622, and of 79 credit unions, \$7,264,571.

For the fiscal year ended June 30, 1956, the state treasurer received revenues of \$444,444,422, compared with \$415,285,633 for the year before. Expenditures of the treasurer were \$435,578,615. The gross debt on June 30, 1956, was \$10,411,335; a sinking fund of \$4,708,997 left a net debt of \$5,702,338. The fiscal year ended with cash in the general fund amounting to \$46,405,605, along with investments valued at \$1,754,800.

Table I.—Principal Crops of Virginia

Crop	Indicated 1956	1955	Average, 1945-54
Corn, bu.	38,208,000	32,870,000	37,575,000
Wheat, bu.	7,236,000	6,630,000	7,676,000
Oats, bu.	5,092,000	5,548,000	3,997,000
Rye, bu.	352,000	396,000	321,000
Hay, all, tons	1,717,000	1,812,000	1,627,000
Peanuts, lb.	213,500,000	180,960,000	206,466,000
Soybeans, bu.	5,214,000	4,020,000	2,250,000
Irish potatoes, cwt.	3,724,000	4,048,000	3,958,000
Sweet potatoes, cwt.	1,384,000	1,558,000	1,242,000
Cotton, bales	13,000	11,400	16,400
Tobacco, lb.	161,607,000	162,049,000	160,720,000
Apples, bu.	10,500,000	5,500,000	8,965,000
Peaches, bu.	1,500,000	470,000	1,459,000
Barley, bu.	4,602,000	4,130,000	2,751,000

Source: U.S. Department of Agriculture.

Table II.—Principal Industries of Virginia

	All em- ployees 1955 (in 000's)	Salaries and wages 1955 (in 000's)	Value added by manu- facture 1955 (in 000's)	Value add- ed by manu- facture 1954 (in 000's)
All manufacturing	249.0	\$843,041	\$1,714,258	\$1,657,429
Food and kindred products	26.0	75,584	151,017	129,816
Tobacco products	15.1	47,397	209,559	186,674
Textile mill products	37.9	117,839	176,086	154,416
Apparel and related products	20.0	43,370	55,722	49,846
Lumber and related products (except furniture)	27.1	60,303	98,515	87,062
Furniture and fixtures	15.1	48,782	87,350	98,731
Paper and allied products	10.6	44,442	88,351	78,982
Chemicals and allied products	36.2	162,717	448,415	491,564
Leather and leather products	5.6	13,907	18,505	16,427
Stone, clay, and glass products	7.2	23,428	55,384	44,931
Primary metal industries	4.0	16,428	25,122	19,440
Fabricated metal products	8.8	36,712	71,764	57,562
All other manufacturing industries*	4.9	15,598	24,948	174,259

*Includes rubber products, products of petroleum and coal and miscellaneous manufacturing industries.

Source: Virginia Department of Labor and Industry; data obtained in preliminary annual survey of Virginia manufacturers for 1955 and final survey for 1954.

Table III.—Mineral Production of Virginia

Mineral	Quantity 1953	Value 1953	Quantity 1954†	Value 1954†
Total		\$152,979,000		\$129,603,000‡
Clays	952,000	928,000	705,000	723,000
Coal	19,119,000	102,022,000	16,387,000	72,901,000
Coke*	188,000	2,551,000	72,000	1,032,000
Lead	3,000	730,000	4,000	1,184,000
Lime	477,000	4,947,000	445,000	4,611,000
Manganese ore	8,000	636,000	23,000	1,781,000
Natural gas (000 cu.ft.)	3,697,000	954,000	1,401,000	380,000
Sand and gravel	5,276,000	5,161,000	7,115,000	8,658,000
Stone	9,092,000	16,259,000	10,894,000	18,138,000
Zinc	17,000	3,835,000	17,000	3,615,000
Other minerals . . . . .	...	14,956,000	...	19,894,000

*Values for processed materials are not included in the totals.

†Preliminary. ‡Total has been adjusted to eliminate duplication in the value of clays and stone.

Source: U.S. Bureau of Mines.

Agriculture.—The state department of agriculture reported in 1956 that the number of farms had dropped nearly 10% in five years to a total of 136,416. The amount of land under cultivation had declined steadily in the past 20 years, reaching a low of 14,686,000 ac. During this period, the department reported a marked change in the use to which the land was being put, with more and more acreage shifting from cultivated crops to hay and pasture. These changes were accompanied by rapid growth of commercial broiler and turkey production, as well as by increased output of beef, pork, eggs and milk. The department reported 1955 production of milk at 1,990,000,000 lb., eggs at 72,667,000 doz., broilers at 171,055,000 lb., turkeys at 66,216,000 lb., cattle and calves at 317,760,000 lb., hogs at 204,561,000 lb. and sheep and lambs at 21,705,000 lb. Production of other farm crops is summarized in Table I.

Manufacturing.—The value of products manufactured in Virginia in 1955 totalled \$4,599,388,000, according to a preliminary survey of the state department of labour and industry. Its study covered 1,900 of the state's 4,400 manufacturing establishments, a group accounting for 80% of the total manufacturing employment in Virginia. The final tally of the preceding year showed the value of manufactured products in 1954 to be \$4,370,866,000. The number of persons engaged in manufacturing in 1955 totalled 249,000; their salaries and wages totalled \$843,041,000. Within these totals, 214,000 persons were classed as production workers, who were paid \$647,046,000 in wages. (W. B. F.)

Mineral Production.—Table III shows the tonnage and value of those mineral commodities produced in Virginia in 1953 and 1954 whose value exceeded \$100,000. In 1954 Virginia was first among the states in ilmenite output and one of two states that produced kyanite (a refractory material), was second in output of pyrite and third in manganese. It ranked 23rd in value of its mineral output, with 0.93% of the U.S. total.

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The Virgin Islands have the status of an organized but unincorporated territory of the United States, located 1,400 mi. S.E. of New York city and 40 mi. E. of Puerto Rico. The three largest islands, with a total area of 133 sq.mi., are St. Croix (pop. 12,103, census of 1950), St. Thomas (13,813) and St. John (749). The chief cities are Charlotte Amalie, the capital (11,469), on St. Thomas, and Christiansted (4,112) and Frederiksted (1,961) on St. Croix. On July 1, 1955, the U.S. census bureau estimated the total population at 24,000.

History.—Appointed by Pres. Dwight D. Eisenhower on Aug. 19, 1955, Walter A. Gordon of Berkeley, Calif., was inaugurated as governor of the Virgin Islands on Oct. 17, 1955. Other officials in 1956 were: government secretary, Charles K. Claunch of Chicago, Ill.; U.S. attorney, Leon P. Miller; and judge of the district court, Herman E. Moore.

Since the enactment of the Revised Organic Act of the Virgin Islands on July 22, 1954, legislative power has been vested in a unicameral legislature composed of 11 senators elected for two years, 5 representing three electoral districts and 6 elected at large. The islands are under the jurisdiction of the U.S. department of the interior. The government is composed of nine executive departments, each headed by a commissioner appointed by the governor and confirmed by the legislature.

Education.—Education is compulsory for all children between the ages of 5½ and 15. In the three islands there were 28 public schools in 1956, consisting of 5 kindergartens, 13 rural schools, 7 city elementary schools, 1 junior high school and 2 junior-senior high schools. Total enrolment in public schools was 5,886 at a per capita cost (exclusive of school lunches, adult education and community services) of \$141. The department of education budget for the fiscal year was \$1,050,642.30.

Banking and Finance.—Total revenue for the fiscal year ending June 30, 1956, from real property taxes, income taxes, matching funds and grant-in-aid funds, and miscellaneous federal contributions amounted to \$6,658,925.43. There are two banks in the Virgin Islands. The Virgin Islands National bank had assets of \$10,385,445.71 as of June 30, 1956, and on the same date the West Indies Bank and Trust company had assets of \$6,941,817.46.

Trade and Communications.—For the fiscal year ending June 30, 1956, the value of exports was \$5,431,329; imports were \$12,506,509. Income from tourists was estimated at \$14,000,000. In 1956 there were in St. Thomas and St. John: highways, 90 mi.; motor vehicles, 2,044; airports, 1; air lines, 3; telephones, 1,700. In St. Croix there were: highways, 150 mi.; motor vehicles, 2,551; airports, 1; air lines, 2; telephones, 688. There were four newspapers and two radio stations in the Virgin Islands. There were daily air mail and passenger service between St. Thomas and St. Croix; daily boat mail and passenger service between St. Thomas and St. John; and cable offices in St. Thomas and St. Croix.

Social Services.—Total public assistance payments for the fiscal year 1955-56 amounted to \$305,170.37. This included old-age assistance \$154,686.09; aid to dependent children \$91,612.58; aid to the blind \$7,540.76; aid to the disabled \$23,791.96; general assistance \$26,570.98; trust funds (monthly grants) \$968. The average monthly payments per recipient were: for old-age assistance \$18.54; aid to dependent children \$9.60 per person, in families with children; aid to the blind \$19.35; aid to the disabled

\$19.47; general assistance \$18.72.

Three homes were maintained for the aged and indigent, and there was one training school for boys.

The principal industries in the Virgin Islands are: tourism; sugar-cane cultivation; manufacture of rum and bay rum; meat packing; manufacture of concrete blocks; bunkering and other servicing of ships; transshipment of bauxite; passenger transportation; cattle and hog raising; truck gardening; poultry raising; construction; deep-sea and commercial fishing; manufacture of plastic buttons and wearing apparel; assembling of jewelry and ball-point pens; banking, insurance and real estate.

During the fiscal year 1955-56 a total of 96,442 tons of sugar cane and 10,220 tons of sugar were produced.

(C. K. C.)

Virgin Islands, British: see LEEWARD ISLANDS.

Viruses: see MEDICINE; POLIOMYELITIS; RESPIRATORY DISEASES.

Visual Education: see MOTION PICTURES.

Vital Statistics: see BIRTH STATISTICS; CENSUS DATA, U.S.; DEATH STATISTICS; INFANT MORTALITY; MARRIAGE AND DIVORCE; SUICIDE STATISTICS.

Vitamins and Nutrition. **Vitamin Deficiencies and Heart Action.**—Degenerative changes in the heart may be induced by a diet deficient in the B-complex vitamins. Many studies have implicated thiamine, one of the B-complex vitamins, as the basic deficiency involved in beriberi, a disease characterized by heart symptoms.

The effect of a deficiency of thiamine and another B-complex vitamin, pantothenic acid, on heart action, was studied by A. Beznák and G. van Alphen. A deficiency of these vitamins decreases a certain metabolic process (choline acetylation). These researchers proposed that the cardiac symptoms resulting from vitamin deficiencies was the result of decreased choline acetylation. These workers, therefore, observed the results of vitamin-deficient diets on three groups of rats. For six months the animals were maintained on diets that were adequate in all respects but lacking in thiamine for group I, pantothenic acid for group II and both thiamine and pantothenic acid for group III.

Electrocardiograms were taken when symptoms of vitamin deficiency became apparent and the animals were sacrificed for enzyme studies. The deficiency symptoms exhibited by the thiamine-deficient animals were apathy, curved back and avoidance of movement. The pantothenic acid-deficient animals, however, showed no deficiency symptoms and grew almost normally. Thiamine-deficiency symptoms were delayed and lessened in animals deficient in both thiamine and pantothenic acid. This group of animals and the animals deficient in thiamine became bradycardic (abnormal slowness of the heart beat) and exhibited other cardiac changes found in rats on a multideficient diet. The heart symptoms developed in 20 days in the thiamine-deficient animals and in 50 days in the animals deficient in both thiamine and pantothenic acid. In contrast, in addition to exhibiting no gross deficiency symptoms, the animals deficient in pantothenic acid only, had normal heart action. Furthermore, choline acetylation was apparently normal in all three groups of animals.

The original hypothesis that heart symptoms ascribed to these vitamin deficiencies were caused directly by decreased choline acetylation was not supported by the results of this experiment. However, the unexpected result that a pantothenic acid deficiency would lessen and retard cardiac symptoms associated with a thiamine deficiency was a worthwhile and interesting observation.

Disease Resistance and High Vitamin Intakes.—Most of the research conducted on the effect of vitamins on resistance to disease was concerned with a deficiency of vitamins. Little attention was given to the possibility that high levels of certain vitamins in the diet might actually decrease resistance to infectious organisms.

C. H. Hill and H. W. Garren tested the effect of all the known required vitamins on the resistance of newly hatched chicks to fowl typhoid. The experimental period was divided into two

parts, a preinoculation period of four weeks and a postinoculation period of approximately three weeks. The birds were inoculated with a culture of chick typhoid at four weeks of age. The typhoid disease was allowed to run its natural course.

The first experiment was designed to determine the effect of high levels of all the known vitamins (ten times the minimum daily requirement) on the resistance of chicks to fowl typhoid. This high-vitamin diet not only increased the average survival time, but also increased the number of animals who survived, from 10% to 40%.

Studies were then undertaken to decide whether the enhanced resistance resulting from high-vitamin levels was the result of a single vitamin or of a group of vitamins. The vitamins were divided into three groups, the fat-soluble group (A,D,E and K), the water-soluble B-vitamin group and ascorbic acid. Chicks were fed diets high in one of the three groups of vitamins. No beneficial effects were observed in any of these groups; in fact, high levels of the fat-soluble vitamins actually decreased both the total and average survival time.

To determine which of the vitamins were necessary, unnecessary or harmful, these investigators conducted studies using the high-vitamin supplement of all vitamins except the one under test. The vitamin being tested was present at the same level as in the basal diet. The absence of high levels of thiamine, biotin, folacin or pantothenic acid apparently increased the resistance of the chicks while high levels of ascorbic acid, vitamin B₁₂, pyridoxine and all of the fat-soluble vitamins were needed in the vitamin mixture.

A study was made to test the possibility that the level of vitamin supplement used in previous studies was too high for maximum resistance. Chicks were given 2½, 5, 7½ and 10 times the level of all vitamins present in the basal diet. It was found that a vitamin supplement five times greater than that of the basal diet resulted in maximum survival and greatest average survival time.

The results of these studies demonstrated that high levels of certain vitamins increase the resistance of chicks to fowl typhoid. To what extent the increased resistance resulted from the effects of vitamin supplement on the chicks and how much from effects on the typhoid organism awaited further study.

Vitamin B₆ (Pyridoxine) in Heated Milk.—Vitamin B₆ deficiency had been observed in man. In addition, it was known that convulsive seizures in infants could be alleviated by pyridoxine administration. It was of interest, therefore, when it was shown that heat processing of canned liquid milk resulted in some destruction of pyridoxine.

R. M. Tomarelli and coworkers studied the growth response of rats fed a purified basal diet (formulated to simulate milk) deficient in vitamin B₆ which was supplemented by canned evaporated milk or spray-dried fresh milk. The activity of the vitamin in the milks was also determined by growth of microorganisms.

The growth of the rats fed canned milk indicated that the milk had only about one-half the pyridoxine content indicated by growth of microorganisms. For example, 22 grams of heated milk solids supplied 60 micrograms of microbiologically active pyridoxine, but had a biologic activity of only 30 micrograms for the rat.

Spray-dried fresh milk, however, gave the same activity for the rat as for microorganisms. It was of interest that the pyridoxine-deficiency syndrome had not been observed in infants fed formulas marketed as a spray-dried powder. The researchers did not have an explanation for the decrease in biologic activity of pyridoxine for rats as a result of heat sterilization of milk. The vitamin may be converted to a form still usable by microorganisms but limited for the rat, or the pyridoxine requirement might be increased in an indirect manner by changes in other milk components. The results of these studies indicated that micro-

biologic assay is not adequate for the proper assessment of the available pyridoxine in infant formulas.

Dietary Fat and Thiamine Requirement.—It had been generally accepted that the need for thiamine is related primarily to the nonfat calories in the diet. Dietary fat has a sparing action on thiamine and experiments had established a biochemical role for this vitamin as a component in intermediary carbohydrate metabolism. The factors involved in the thiamine-sparing action of dietary fat were not entirely known, but some possibilities were suggested. For example, the organism may use less thiamine in its metabolism when fat is fed than when carbohydrate is fed. On the other hand, a high fat diet may operate in an unknown manner to delay thiamine-deficiency symptoms. Still another possibility may be that deficiency symptoms may be induced by a toxic substance formed and not removed when an animal is fed a high carbohydrate diet deficient in thiamine.

Evidence concerning this problem was presented by L. E. Holt and S. E. Snyderman. They reported two studies designed to determine the thiamine requirement of infants. Two infants were fed purified formulas consisting of vitamin-free casein, hydrogenated cottonseed oil, vitamin-free dextrimaltose, salts and a vitamin supplement. The formulas varied in their content of fat and carbohydrate. The infants were first placed on a formula containing high fat and low carbohydrate content. Their thiamine intake was then adjusted until thiamine excretion in the urine reached a constant value (control level). The formula was then altered by increasing the carbohydrate and decreasing the fat. The effect on the amount of thiamine excreted in the urine was observed and the dietary intake of thiamine was again altered to bring the urinary excretion of thiamine back to the control level.

In one study a normal infant of eight months was fed a formula providing 15% of the calories as protein, 35% as fat and 50% as carbohydrate. To maintain the urinary output of thiamine at the control level, 0.20 mg. of dietary thiamine per day was required. The formula was then changed so that protein supplied 10% of the total calories, fat 10% and carbohydrate intake was increased to supply 80% of the total calories. The increase in carbohydrate decreased the urinary thiamine. Dietary thiamine had to be increased 40% (0.28 mg.) to return the urinary thiamine to its control level.

A second child 18 months old was studied in a similar manner. When he was given a diet composed of 40% protein, 30% carbohydrate and 30% fat, he needed 0.24 mg. of thiamine to maintain his urinary thiamine output at a control level. When fat was omitted from his formula and the carbohydrate was raised to supply 60% of the total calories, his thiamine excretion fell. An increase to 0.28 mg. thiamine per day was required to restore thiamine excretion to the control level. Dietary fat was then raised and excess thiamine appeared in the urine. Thiamine intake was lowered to 0.20 mg. per day to return thiamine excretion to the control level.

The researchers concluded on the basis of these experiments, that more thiamine is required in the metabolism of dietary carbohydrate than in the metabolism of dietary fat. This phenomenon, they felt, accounted for the thiamine-sparing action of dietary fat.

(See also NUTRITION, EXPERIMENTAL.)

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Wages and Hours.

Real wages in the U.S. for the first eight months of 1956 were from 1.0% to 12.1% above those for the corresponding months of 1955, with the exception of July, which showed a decline of 1.9% from the previous year (see Table I).

Table I.—U.S. Real Wage Indexes

(1947—1949=100)

Months	Consumers' price index		Index of average weekly manufacturing wages		Index of real wages	
	1956	1955	1956	1955	1956	1955
Jan.	114.6	114.3	159.1	141.5	138.8	123.8
Feb.	114.6	114.3	157.7	144.4	137.6	126.3
March.	114.7	114.3	157.9	146.6	137.7	128.3
April	114.9	114.2	158.2	146.7	137.7	128.5
May	115.4	114.2	157.3	150.1	136.3	131.4
June	116.2	114.4	158.2	152.1	136.1	133.0
July	117.0	114.7	151.1	150.9	129.1	131.6
Aug.	118.0	114.5	160.9	154.6	136.4	135.0
Sept.	—	114.9	—	158.6	—	138.0
Oct.	—	114.9	—	161.1	—	140.2
Nov.	—	115.0	—	163.8	—	142.4
Dec.	—	114.7	—	163.7	—	142.7

Source: Survey of Current Business, United States Department of Commerce.

The level of business operations remained stable as compared with 1955, as indicated by a drop of 1.1% in manufacturing employment, accompanied by an increase of .01% in manufacturing payrolls (July figures). During the same period, however, total civilian employment increased 2.6%. Total wage and salary payments in July 1956 were 5.0% above those for July 1955.

Average weekly earnings for all manufacturing industries increased 3.2%, while the cost-of-living (consumers' price index) moved from a 1955 high of 115.0 to a 1956 high of 118.0, representing a rise of 2.6%. The only industries showing declines in average weekly earnings were iron and steel (5.4%), automobiles (6.3%) and transportation equipment (less than .1%).

Table II.—Average U.S. Weekly Earnings, Average Weekly Hours, and Average Earnings Per Hour in Major Industries

Industry	Average weekly earnings July		Average weekly hours July		Average hourly earnings July	
	1956	1955	1956	1955	1956	1955
ALL MANUFACTURING	\$78.80	\$76.36	40.0	40.4	\$1.97	\$1.89
Durable goods	84.04	82.21	40.6	40.9	2.07	2.01
Nondurable goods	71.53	68.06	39.3	39.8	1.82	1.71
Iron and steel	93.37	98.65	37.8	40.1	2.47	2.46
Electrical machinery	79.20	74.82	40.0	39.8	1.98	1.88
Nonelectrical machinery	91.96	86.32	41.8	41.5	2.20	2.08
Transportation equipment	92.97	92.99	40.6	41.7	2.29	2.23
Automobiles	91.64	97.75	39.5	42.5	2.32	2.30
Nonferrous metals	92.51	85.05	41.3	40.5	2.24	2.10
Lumber and wood products	71.82	69.66	39.9	40.5	1.80	1.72
Furniture and fixtures	67.13	64.96	40.2	40.6	1.67	1.60
Stone, clay and glass	80.36	77.23	41.0	41.3	1.96	1.87
Textile mill products	55.73	54.25	38.7	39.6	1.44	1.37
Apparel, etc.	51.91	48.24	35.8	36.0	1.45	1.34
Leather and leather products	56.47	52.40	37.9	37.7	1.49	1.39
Food and food products	76.26	72.07	41.0	41.9	1.86	1.72
Tobacco manufactures	57.90	53.62	38.6	38.3	1.50	1.40
Paper and allied products	84.08	79.74	42.9	43.1	1.96	1.85
Printing and publishing	93.41	90.95	38.6	38.7	2.42	2.35
Chemicals and allied products	87.54	83.22	41.1	41.2	2.13	2.02
Products of coal and petroleum	106.50	99.53	41.6	41.3	2.56	2.41
Rubber products	86.37	86.32	39.8	41.3	2.17	2.09
Miscellaneous manufacturing	68.73	66.51	39.5	39.7	1.74	1.65
NONMANUFACTURING						
Coal mining	92.62	86.27	35.9	35.5	2.58	2.43
Anthracite	101.03	95.50	35.7	38.2	2.83	2.50
Bituminous	96.22	91.46	42.2	41.2	2.28	2.22
Metallic mineral mining	85.30	81.22	43.3	43.2	1.97	1.88
Street railways and buses	74.03	72.00	39.8	40.0	1.86	1.80
Telephone	85.24	79.34	42.2	42.2	2.02	1.88
Telegraph	92.32	86.94	41.4	41.4	2.23	2.10
Gas and electric utilities	82.62	78.12	40.7	40.9	2.03	1.91
Wholesale trade	44.98	43.08	35.7	35.9	1.26	1.20
General merchandise stores	42.13	40.89	40.9	41.3	1.03	.99
Hotels	102.95	98.95	34.9	37.2	2.79	2.66
Building construction						

Source: Survey of Current Business, United States Department of Commerce.

The greatest increase in weekly take-home pay was in production of nonferrous metals, where the average went up by 8.8% over 1955. The next highest increase, 8.0% was in tobacco manufacturing, followed by a 7.8% increase in leather and leather products. Smallest increases in average weekly earnings were in rubber products (less than .1%) and textile mill products and printing and publishing (each with 2.7%).

Reversing the previous year's trend, earnings in nondurable goods manufacturing rose by 5.1%, while those in durable goods manufacturing increased only 2.2%.

For the first time, earnings exceeded \$100 per week. This occurred in three industries: products of coal and petroleum, bituminous coal mining and building construction. This was true for 8 out of the preceding 12 months in bituminous coal mining, as compared with 6 out of 12 months in products of coal and petroleum, and 4 out of 12 months for building construction. In addition, average weekly earnings exceeded \$100 in iron and steel for five out of the preceding 12 months, although the figure as of July 1956 was \$93.37.

Earnings exceeded \$90 per week in 12 industries in 1956, compared with 8 in 1955. Nineteen industries paid average weekly earnings exceeding \$80 (against fourteen the prior year), and 6 industries less than \$60, in 1956.

The length of the average work week dropped in 20 industries, was increased in 9 industries and remained unchanged in 2. In 19 cases, however, the net change was less than 1%. The greatest change was a decline of 7% in the length of the work week, in the automobile industry. The longest work week in 1956 was in street railways and buses, followed closely by paper and allied products. Workers in 16 industries worked more than 40 hours per week, compared with 19 industries for 1955.

Bituminous coal mining and general merchandise stores had the shortest work week (35.7 hours), followed by the apparel industry (35.8) and anthracite coal mining (35.9).

Highest average hourly earnings were paid in bituminous coal mining (\$2.83), followed by \$2.79 in building construction and \$2.58 in anthracite coal mining. Sixteen industries paid average hourly rates in excess of \$2.00 compared with 14 in 1955.

Hourly rates of pay increased in all industries reported in 1956. The greatest proportionate gains in hourly rates were in bituminous coal mining (13.2%), apparel (8.2%), and food and food products (8.1%). The lowest monetary rate was \$1.03 in hotels (not including tips, board, room or uniforms), but this was four cents higher than in 1955. For manufacturing as a whole, the increase in hourly rates was 4.2%, compared with 5.0% in 1955 and 1.7% in 1954.

Table III shows a five-year climb of 23.4% in hourly earnings for all manufacturing industries. The greatest improvement over the five-year span was one of 31.6% in iron and steel. The industry showing the weakest increase over the five-year period was textile products (9.8%), followed by anthracite coal mining, which increased 16.0% from 1951 to 1956.

Table III.—*Rise in Hourly U.S. Earnings Rates*

Industry	July figures†			Index, 1956			(1947-49 =100)
	1951*	1952*	1953*	1954	1955	1956	
ALL MANUFACTURING	\$1.60	\$1.66	\$1.77	\$1.80	\$1.89	\$1.97	149.2
Durable goods	1.68	1.76	1.88	1.91	2.01	2.07	147.9
Nondurable goods	1.48	1.54	1.61	1.66	1.71	1.82	146.8
Iron and steel	1.88	1.95	2.20	2.20	2.46	2.47	158.3
Machinery (nonelectrical)	1.76	1.85	1.96	2.01	2.08	2.20	150.7
Automobiles	1.94	1.97	2.16	2.16	2.30	2.32	143.2
Lumber and allied products	1.47	1.56	1.65	1.56	1.72	1.80	155.2
Textile products	1.31	1.35	1.36	1.36	1.37	1.44	128.6
Food and food processing	1.46	1.54	1.60	1.68	1.72	1.86	153.7
Tobacco products	1.14	1.17	1.28	1.37	1.40	1.50	150.0
Rubber products	1.70	1.85	1.95	1.95	2.09	2.17	146.6
NONMANUFACTURING							
Coal mining							
Anthracite	2.23	2.22	2.46	2.51	2.43	2.58	149.1
Bituminous	2.22	2.26	2.47	2.49	2.50	2.83	152.2
Wholesale trade	1.58	1.67	1.78	1.83	1.91	2.03	150.4
Building construction	2.21	2.28	2.47	2.58	2.66	2.79	153.3

*August figures.

Source: *Survey of Current Business*, United States Department of Commerce.

Common labour in July 1956 received an average hourly rate of \$2.187, compared with \$2.073 in 1955. This represents an increase of 5.5%. Farm wages were up three cents per hour to 91 cents, which was 3.4% higher than for the preceding year. Reported farm wages do not include a monetary evaluation of room

and board, which normally are furnished in addition to cash payment.

In summary, wage payments in 1956 reflected the stability experienced in general business activity. This also was true in sustained high-level employment as well as in average hourly and weekly earnings.

(See also AGRICULTURE; BUILDING AND CONSTRUCTION INDUSTRY; BUSINESS REVIEW; LABOUR UNIONS; PRICES.)

(D. J. H.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Productivity: Key to Plenty* (1949); *Working Together* (1952).

Wales: see GREAT BRITAIN & NORTHERN IRELAND, UNITED KINGDOM OF.

Walnuts: see NUTS.

War, Law of: see INTERNATIONAL LAW.

Warsaw Pact: see ARMIES OF THE WORLD.

Washington. A state in the extreme northwestern United States, popularly known as the "Evergreen state," Washington was admitted to the union Nov. 11, 1889. Total area: 68,192 sq.mi., of which 66,786 sq.mi. is land. Pop. (1950) 2,378,963; native white 2,125,495, foreign-born white 191,001, Negro 30,691 and other races 31,776. According to the state bureau of the census estimate, the state's total population on July 1, 1956, was 2,600,000. In 1950 the urban population was 1,503,166 or 63.2% of the total population. The population of the five largest cities, according to April 1, 1956, estimates (1950 figures in parentheses) were respectively: Seattle 561,000 (467,591); Spokane 185,000 (161,721); Tacoma 156,200 (143,673); Yakima 44,200 (38,486); Vancouver 42,300 (41,664). State capital, Olympia 17,300 (15,819).

History.—Because of the narrow division between the two parties in the United States senate, both major parties featured at their national conventions in 1956 the candidates contesting for the seat from Washington. At the Democratic convention at Chicago, Ill., Warren G. Magnuson, Democratic senator from Washington seeking re-election, was given a favourite-son nomination for president. His Republican opponent, incumbent Gov. Arthur B. Langlie, keynoted the convention of his party at San Francisco, Calif. In the primary election both men were unopposed in their parties. Magnuson received 422,761 votes and Langlie 289,302.

In the Nov. 6 election, Pres. Dwight D. Eisenhower carried the state by a smaller vote than in 1952. Warren Magnuson's margin over Langlie was larger than in the primary. Don Magnuson, no relative to the above, and incumbent congressman at large, defeated Philip Evans, Republican. Of the six Republican incumbent congressmen, five were renominated and elected by substantial votes compared with those of their Democratic opponents. However, Hal Holmes, Republican, seeking his eighth term in the 4th district, held only a slight edge over the combined votes for the two Democratic aspirants in the primary, and in the final election, he trailed Frank Le Roux, Democrat, by more than 1,200 votes before the absentee ballots were counted, but finally won the election by a small margin.

With respect to the eight state partisan elective executive offices, the Democrats made a complete sweep by substantial majorities. For the nonpartisan office of superintendent of public instruction, incumbent Pearl A. Wanamaker received only a plurality in the primary and lost to second place Lloyd J. Andrews in the final election.

The Democrats would control both houses of the state legislature during its 35th session, the senate by a 31-15 count and the house of representatives by a 56-43 margin.

Two initiative measures and five constitutional amendments

were on the 1956 ballot. A right to work initiative, which met favour with only one gubernatorial aspirant in the primary, was defeated by a ratio of 2 to 1. Another initiative, sponsored by the state League of Women Voters, was designed to reorganize the state's legislative districts. This had not been done since 1930 despite the state constitution's mandate that there be redistricting after each federal census. The measure was challenged in the courts, but the state supreme court by unanimous decision ordered it placed on the ballot and held that its constitutionality could be determined only if it were enacted into law. The voters approved this initiative. An amendment to permit the increase of pensions of public officers during their term of office was defeated as was an amendment to permit the state, upon filing an eminent domain action proceeding, to take possession of the property after payment into court, before trial, of such amount as provided by law. Its purpose had been announced to be the facilitating of the state's highway construction program. By safe margins three amendments were accepted. One increased the number of signatures required on initiative and referendum petitions to 8% and 4% respectively of the number of registered voters who voted for governor at the last election. Another removed the prohibition of election of the state treasurer for more than one successive term. A third required the filling of vacancies in the state legislature by persons of the same party as the legislators whose offices had been vacated.

On April 26, 1956, the state supreme court declared unconstitutional the so-called Ryder act, enacted by the 1955 state legislature and designed to bring the assessed valuation of real property within school districts into conformity with state constitutional requirements.

The chief officers of the state for 1957 were: governor, Albert D. Rosellini; lieutenant governor, John A. Cherberg; secretary of state, Victor A. Meyers; treasurer, Tom Martin; state auditor, Cliff Yelle; attorney general, John O'Connell; state superintendent of public instruction, Lloyd J. Andrews (elected on nonpartisan basis); commissioner of public lands, Bert Cole; state insurance commissioner, William A. Sullivan; and chief justice of state supreme court, Matthew W. Hill.

Education.—On Oct. 1, 1955, the enrolment in the public elementary schools was 320,547, in secondary schools 103,028 and junior high schools 68,897, and the average daily attendance during the school year 1954-55 in these schools was 299,711, 86,815 and 68,033 respectively. The total number of teachers was 21,672 and the average salaries of all certified personnel was \$4,603.29. Total current expenditures were \$149,603,511.99 and the cost per pupil in attendance was \$309.

Full-time student enrolment during the fall term of 1955 was 13,967 at the University of Washington and 5,864 at the State College of Washington. During that term three teachers' colleges had a total enrolment of 4,462, nine junior colleges integrated with the secondary school program but operated with state funds had a total of 4,908 students and 13 privately endowed universities and colleges in the state had 10,719 students.

Social Insurance and Assistance, Public Welfare and Related Programs.—During the period Sept. 1, 1955, to Aug. 31, 1956, inclusive, public assistance in the state, including federal expenditures and state aid, cost \$78,073,568.38. An average of 120,659 persons received assistance to the amount of \$70,484,760.08. An average of 21,209 persons received a total of \$8,464,519.73 in general assistance. An average of 59,091 old persons received a total of \$42,962,278.26. An average of 30,601 dependent children received a total of \$11,335,980.76. A total of \$2,194,294.64 was provided for the foster care of an average of 3,546 children. An average of 837 blind persons received a total of \$740,457.13. A total of \$4,785,537 in disability payments was paid to an average of 5,759 persons. A total amount of \$872,658.88 was provided for public assistance service, of which \$147,937.47 was extended to the blind and \$730,721.41 was provided for burials. Administration of the entire program cost \$6,710,169.74.

On June 30, 1955, ten state charitable institutions had a total population of 11,362 and eight correctional institutions had a total of 2,822. The total appropriations for both programs for the fiscal biennium July 1, 1955, to June 30, 1957, amounted to \$38,571,557 and total expenditures for the fiscal year ending June 30, 1956, were \$17,610,579.15.

Communications.—Railroads in the state during 1955 carried freight to a total of 8,589,406.689 ton-miles and passengers to a total of 316,954,860 passenger-miles. There were 5,939 mi. of track.

On Jan. 1, 1956, the total mileage of highways in Washington was 45,888 of which 12,377 mi. were federal-aid highways. Total state expenditures for state highways during the period Feb. 1, 1955, to Jan. 31, 1956, were \$55,719,228. There were 915,007 telephone instruments in service Dec. 31, 1955.

In 1956 the state was served by nine air lines; there was a total of 117 airports and 15 seaplane bases, and 84 privately owned but restricted-use airports.

Banking and Finance.—In 1955 the state board of equalization placed the value of real and personal property at \$7,199,220,326 and equalized it for the purposes of taxation at \$3,559,610,163. The bonded indebtedness was \$49,506,000 and outstanding warrants amounted to \$58,219,351.22. For the year ending June 30, 1956, receipts, including cash and warrant transfers, were \$863,918,925.23 and disbursements, including cash and warrants redeemed, were \$869,718,415.68. The treasurer's cash balance was \$68,423,919.51 on June 30, 1956.

On that day there were 98 banks, including four mutual savings banks, reporting a total capital of \$56,803,000; capital surpluses, undivided profits and reserves of \$210,558,000; deposits of \$2,603,342,000 and total assets of \$2,848,087,000.

Agriculture.—In 1956 the total value of farmland and buildings in the state was placed at \$2,079,000,000 and the average value per acre at \$117.82. Cropland harvested in 1954 was reported as 4,343,000 ac. In 1955 the total value of farm production was \$585,634,000, of which \$218,348,000 represented field crops, \$194,280,000 livestock and products, \$121,510,000 fruit, nut and berry crops, \$31,785,000 specialty crops and \$19,711,000 vegetable crops. Cash receipts from farming totalled \$534,489,000, of which total farm marketings amounted to \$530,707,000, from livestock and products \$181,280,000, and from crops \$349,427,000. Government payments were \$3,782,000.

Table I.—Principal Crops of Washington

Crop	Estimated 1956	1955	Average, 1945-54
Wheat, bu.	59,963,000	55,832,000	72,626,000
Apples, bu.	17,300,000	26,100,000	27,523,000
Hay, all, tons	1,691,000	1,606,000	1,541,000
Barley, bu.	20,872,000	18,450,000	6,036,000
Pears, bu.	4,410,000	6,450,000	6,346,000
Hops, lb.	21,646,000	20,800,000	22,661,000
Potatoes, cwt.	10,256,000	9,633,000	6,788,000
Sugar beets, short tons	690,000	553,000	434,000
Peas, dry, 100-lb. bags	2,430,000	1,149,000	1,986,000
Green peas, tons	120,240	62,130	64,720

Source: U.S. Department of Agriculture.

Manufacturing and Trade.—In 1954 the value added by manufacture was \$1,589,159,000, the total number of employees in manufacturing throughout the year was 194,758 and the total payroll amounted to \$852,049,000. The average annual labour force during 1955 was 1,007,500, of which an average of 957,200 were employed. Domestic workers numbered 17,300; agricultural workers 85,400 and nonagricultural workers 871,800. Manufacturing establishments employed 201,400, the wholesale and retail trade 172,000 and service industries 84,100, the transportation companies and utilities 62,700 and government 147,000.

The output of lumber in 1955 was 3,666,000,000 bd.ft. (estimated); pulp production 2,579,000 tons; and plywood production for the Pacific northwest was 4,911,000,000 sq.ft.

The salmon pack for the Puget sound and the Columbia river districts was 803,000 cases in 1955 compared with 935,000 cases in 1954.

For the year 1955 the Washington customs district reported total exports of \$306,396,258 and total imports of \$291,780,971 (H. J. DE.)

Table II.—Principal Industries of Washington

	All employees 1954	Salaries and wages 1954 (in 000s)	Value added by manufacture 1954 (in 000s)	Value added by manufacture 1953 (in 000s)
Lumber and products (except furniture)	47,745	\$191,768	\$320,207	\$394,691
Transportation equipment	42,994	204,434	290,437	252,815
Paper and allied products	16,528	76,924	226,204	200,718
Food and kindred products	27,523	105,832	217,268	172,441
Primary metals industries	13,041	61,596	165,494	148,210
Chemicals and products	11,087	61,506	118,212	100,418
Printing and publishing	7,457	33,705	56,776	*
Fabricated metal products	5,744	26,230	44,875	41,956
Machinery (except electrical)	5,655	26,898	40,392	*
Miscellaneous manufactures	4,144	17,162	28,740	*

*Withheld because the estimate did not meet publication standards, either on the basis of the associated standard error of estimate or on the basis of a consistency review. Source: U.S. Department of Commerce, 1954 Census of Manufactures, preliminary report.

Table III.—Mineral Production of Washington

(In short tons, except as noted)

Mineral	Quantity 1953	Value 1953	Quantity 1954	Value 1954
Total		\$54,577,000		\$53,300,000†
Aluminum*	399,000	158,507,000	?	?
Clays	259,000	312,000	261,000	319,000
Coal	690,000	5,048,000	619,000	4,478,000
Copper	4,000	2,147,000	4,000	2,145,000
Gold (oz.)	63,000	2,190,000	67,000	2,336,000
Lead	11,000	2,899,000	10,000	2,723,000
Peat	32,000	104,000	43,000	153,000
Sand and gravel	11,182,000	9,318,000	16,045,000	13,595,000
Silver (oz.)	321,000	291,000	314,000	284,000
Stone	4,438,000	5,891,000	5,367,000	9,527,000
Zinc	33,000	7,541,000	22,000	4,818,000
Other minerals . . . . .	...	18,836,000	...	16,989,000

*Values for processed materials are not included in the totals.

†Total has been adjusted to eliminate duplication in the value of clays and stone.

Source: U.S. Bureau of Mines.

Mineral Production.—Table III shows the tonnage and value of those mineral commodities produced in Washington in 1953 and 1954 whose value exceeded \$100,000. In 1954 Washington was the leading aluminum-producing state and was first in peat output, fourth in diatomite and fifth in chromite; it ranked 33rd in the value of mineral output, with 0.38% of the U.S. total.

ENCYCLOPÆDIA BRITANNICA FILMS.—*Far Western States*, 2nd ed. (1956); *Mt. Rainier* (1955); *Washington* (1955).

Washington, DISTRICT OF COLUMBIA, the capital of the United States, was estimated by the bureau of the census on Jan. 1, 1956, to have 859,000 inhabitants within the fixed boundaries of the District of Columbia, and 1,884,000 people in the surrounding metropolitan areas in Maryland and Virginia.

Within the District of Columbia, the General Services administration of the federal government began in 1956 the demolition of many temporary buildings erected during and after World War I. This was a part of a ten-year program for new federal buildings, to be located in or near Washington. It was generally reported that the Old Patent Office, designed by Robert Mills, would be sold by the federal government and replaced with downtown garages. Protests by the Commission of Fine Arts, the Committee of 100 on the Federal City and others brought a statement from the General Services administration that the building would be preserved, probably as a national portrait gallery.

On Oct. 9 Rock Creek Park day was again celebrated through the co-operation of official and citizen organizations in the district and nearby Maryland. The public interest in Rock Creek park would seem to make it unlikely that any arterial expressway would be permitted to invade its borders.

The Washington chapter of the American Institute of Architects protested the congressionally authorized changes in the Capitol building, which would push out the east wall and provide additional space in the building.

In February the American Planning and Civic association presented a federal city program, with accounts of 30 years of planning by Charles W. Eliot and John Nolen, Jr., successively planners for the Planning commission, and a forecast of the future by John T. Howard, then president of the American Institute of Planners, and consultant to the Planning commission. The association's Committee of 100 on the Federal City presented in November a comprehensive revised program of principles and objectives to guide the future of the federal city.

(H. Js.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Washington—the Capitol City* (1955).

Water Supply and Conservation: *see* DAMS; GEOLOGICAL SURVEY, U.S.; GEOLOGY; IRRIGATION; PUBLIC HEALTH ENGINEERING; SOIL CONSERVATION; TUNNELS; UTAH.

Wealth and Income, Distribution of. The 1956 *Survey of Consumer Finances* in the United States, published by the board of governors of the federal reserve system, supplied information on the distribution of income for 1955 and liquid assets in early 1956. Previous surveys had made information available for the period 1945–54. The surveys were based on small field canvasses of consumer spending units, defined as all persons living in the same dwelling and related by blood, marriage or adoption who pooled their incomes for their major items of expense.

Survey data on the percentage distribution of spending units according to size of holdings of liquid assets—U.S. government securities, deposits in savings and checking accounts at banks and shares in savings and loan associations—are provided in Table I. In early 1956, 72% of spending units owned liquid assets, as compared with the high of 76% reached in 1946. The median holding of all spending units rose from \$250 in 1955 to \$300 in 1956, while the median holding of those that held some liquid assets increased from \$760 to \$800 over the same interval.

Table I.—Distribution of Spending Units by Size of Liquid Asset Holdings

Amounts of liquid assets held*	1946	1950	1954	1955	1956
None	24%	31%	26%	29%	28%
\$1–\$199	15	16	15	17	15
\$200–\$499	14	11	13	12	12
\$500–\$999	14	10	13	10	12
\$1,000–\$1,999	14	10	11	10	11
\$2,000–\$4,999	13	13	13	12	12
\$5,000–\$9,999	4	6	5	6	6
\$10,000 and over	3	3	4	4	4
All units	100%	100%	100%	100%	100%
Median holdings of all units	\$400	\$250	\$350	\$250	\$300
Median holdings of those with assets	\$750	\$810	\$770	\$760	\$800

*Includes all types of U.S. government bonds, checking accounts and savings accounts in banks, postal savings and shares in savings and loan associations and credit unions. Excludes currency holdings.

Source: Board of Governors of the Federal Reserve System.

Table II.—Distribution of Spending Units and Money Income Received, by Income Groups

Annual income (money income before taxes)	1946		1950		1954		1955	
	Spending units	Total money income	Spending units	Total money income	Spending units	Total money income	Spending units	Total money income
Under \$1,000 . . .	17%	3%	13%	2%	10%	1%	11%	1%
\$1,000-\$1,999 . .	23	12	17	7	13	5	12	4
\$2,000-\$2,999 . .	25	21	19	13	14	8	13	7
\$3,000-\$3,999 . .	17	20	19	18	17	13	14	10
\$4,000-\$4,999 . .	8	13	12	16	14	14	14	13
\$5,000-\$7,499 . .	6	11	14	23	21	28	22	28
\$7,500 and over .	4	20	6	21	11	31	14	37
All units	100%	100%	100%	100%	100%	100%	100%	100%

Source: Board of Governors of the Federal Reserve System.

Table II summarizes data provided by the surveys on the distribution of spending units and total money income (before taxes) according to size of income. From 1954 to 1955, as in most previous years of the post-World War II period, there was an upward movement in the distribution of income. The expansion of total money income in the postwar years resulted in a shifting of many consumers to higher income levels. This shifting pervaded the income distribution. When the nation's spending units were ranked into tenths by size of income, it was found that the proportionate shares of total money income received by all but the highest tenth in 1955 were quite similar to those in 1946. The share accounted for by the highest tenth declined from 32% to 29% over the period.

A longer-term comparison of changes in the distribution of income is afforded by Table III. This shows for selected years of the period from 1935–36 to 1954 the percentage of all income going to each fifth of the total number of consumer units (families and unattached individuals), ranging from those with the lowest incomes to those with the highest.

Table III.—Percentage of Family Personal Income Received by Each Fifth of Consumer Units*

Consumer units ranked from lowest to highest income	1935–36	1941	1944	1950	1954
Lowest fifth	4.1%	4.1%	4.9%	4.8%	4.9%
Second fifth	9.2	9.5	10.9	10.9	11.4
Third fifth	14.1	15.3	16.2	16.1	16.6
Fourth fifth	20.9	22.3	22.2	22.1	22.4
Highest fifth	51.7	48.8	45.8	46.1	44.7
All groups	100.0%	100.0%	100.0%	100.0%	100.0%
Top 5%	26.5%	24.0%	20.7%	21.4%	20.5%

*Family personal income represents the current income (before income taxes) received by the civilian noninstitutional population. It includes income in kind as well as money income. Source: Data for 1935–36 and 1941: Selma Goldsmith, George Jaszi, Hyman Kaitz and Maurice Liebenberg, "Size Distribution of Income Since the Mid-thirties," *The Review of Economics and Statistics* (Feb. 1954); data for later years: *Survey of Current Business* Office of Business Economics, U.S. Department of Commerce (March 1955 and June 1956).

The data indicate a distinct reduction in relative income differences. From 1935–36 to 1954 the share of total income received by the highest income bracket declined from 52% to 45%, whereas all four of the other brackets improved their relative positions. The loss of the highest quintile affected mainly the top 5% and was heaviest for the top 1%.

State Distribution of Income.—New highs in personal income were established in every region and in 43 states and the District of Columbia in 1955, the latest year for which department of commerce estimates were available in 1956. For the continental United States as a whole, personal income totalled

\$303,000,000,000—about \$19,000,000,000 or 7% more than in 1954.

Income gains from 1954 to 1955 were relatively highest—8%—in the southeast and far west. They amounted to 6% in the New England, middle east, southwest and central regions. In the northwest the rise in aggregate income was limited to 3%, chiefly because drought conditions caused farm income in Kansas, Nebraska and South Dakota to fall sharply.

On a nation-wide basis, per capita personal income (total personal income divided by total population) was \$1,847 in 1955. Among states, per capita incomes ranged from \$946 in Mississippi to \$2,513 in Delaware. Others in the top rank, all with per capita incomes of more than \$2,250 in 1955, were Connecticut, Nevada, District of Columbia, New Jersey, California, New York and Illinois.

Table IV reveals clearly the relatively high income levels of the northern and far western parts of the country. Despite the

Table IV.—U.S. Personal Income, by States and Regions*

State and region	Total personal income				Per cent change		Per capita personal income, 1955	
	Amount		1955	1954	1954 to 1955	1955 to 1955	Amount nation- (dol.-al aver- sars)	Per cent of aver- age
	1929	(In millions of dollars) 1950 1954						
Continental United States . . .	85,661	225,473 284,747	303,391		7	254	1,847	100
New England . . .	7,125	15,180 18,860	20,075		6	182	2,087	113
Connecticut . . .	1,641	3,860 5,156	5,497		7	235	2,499	135
Maine . . .	479	1,087 1,304	1,443		11	201	1,593	86
Massachusetts . . .	3,862	7,799 9,448	10,010		6	159	2,097	114
New Hampshire . . .	322	699 894	958		7	198	1,732	94
Rhode Island . . .	596	1,287 1,522	1,599		5	168	1,957	106
Vermont . . .	225	448 536	568		6	152	1,535	83
Middle East . . .	28,259	61,651 75,700	80,273		6	184	2,100	114
Delaware . . .	240	689 891	980		10	308	2,513	136
District of Columbia . . .	615	1,774 1,871	1,992		6	224	2,324	126
Maryland . . .	1,260	3,755 5,079	5,463		8	334	1,991	108
New Jersey . . .	3,714	8,699 11,619	12,304		6	231	2,311	125
New York . . .	14,105	28,054 34,175	36,255		6	157	2,263	123
Pennsylvania . . .	7,531	16,477 19,646	20,724		5	175	1,902	103
West Virginia . . .	794	2,203 2,419	2,555		6	222	1,288	70
Southeast . . .	9,196	31,990 40,508	43,758		8	376	1,292	70
Alabama . . .	856	2,659 3,239	3,674		13	329	1,181	64
Arkansas . . .	564	1,539 1,781	1,913		7	239	1,062	57
Florida . . .	753	3,632 5,342	5,923		11	687	1,654	90
Georgia . . .	1,015	3,510 4,418	4,882		11	381	1,333	72
Kentucky . . .	1,020	2,834 3,594	3,728		4	265	1,238	67
Louisiana . . .	866	2,937 3,742	3,910		4	352	1,333	72
Mississippi . . .	570	1,590 1,811	2,018		11	254	946	51
North Carolina . . .	1,046	4,108 4,959	5,371		8	413	1,236	67
South Carolina . . .	470	1,869 2,391	2,557		7	444	1,108	60
Tennessee . . .	982	3,288 4,038	4,288		6	337	1,256	68
Virginia . . .	1,054	4,024 5,193	5,494		6	421	1,535	83
Southwest . . .	4,254	14,666 19,022	20,166		6	374	1,581	86
Arizona . . .	254	979 1,486	1,588		7	525	1,577	85
New Mexico . . .	171	798 1,077	1,134		5	563	1,430	77
Oklahoma . . .	1,077	2,514 3,159	3,328		5	209	1,506	82
Texas . . .	2,752	10,375 13,300	14,116		6	413	1,614	87
Central . . .	25,468	64,432 81,694	86,999		6	242	1,992	108
Illinois . . .	7,280	15,984 19,786	20,988		6	188	2,257	122
Indiana . . .	1,973	6,006 7,619	8,201		8	316	1,894	103
Iowa . . .	1,419	3,799 4,449	4,213		—	197	1,577	85
Michigan . . .	3,803	10,803 14,172	15,632		10	311	2,134	116
Minnesota . . .	1,539	4,184 5,169	5,394		4	250	1,691	92
Missouri . . .	2,275	5,705 7,066	7,560		7	232	1,800	97
Ohio . . .	5,178	12,891 17,221	18,442		7	256	2,062	112
Wisconsin . . .	2,001	5,060 6,212	6,569		6	228	1,774	96
Northwest . . .	3,965	11,176 13,443	13,841		3	249	1,595	86
Colorado . . .	642	1,930 2,519	2,729		8	325	1,764	96
Idaho . . .	225	757 861	895		4	298	1,462	79
Kansas . . .	999	2,643 3,410	3,393		0	240	1,647	89
Montana . . .	312	957 1,074	1,160		8	272	1,844	100
Nebraska . . .	811	1,949 2,236	2,147		—	165	1,540	83
North Dakota . . .	253	781 760	882		16	249	1,372	74
South Dakota . . .	288	793 901	850		—	195	1,245	67
Utah . . .	284	892 1,146	1,238		8	336	1,553	84
Wyoming . . .	151	474 536	547		2	262	1,753	95
Far West . . .	7,394	26,378 35,520	38,279		8	418	2,189	119
California . . .	5,502	19,627 27,148	29,438		8	435	2,271	123
Nevada . . .	79	314 506	572		13	624	2,434	132
Oregon . . .	647	2,451 2,903	3,090		6	378	1,834	99
Washington . . .	1,166	3,986 4,963	5,179		4	344	1,987	108
Territory of Hawaii . . .	—	689 886	946		7	...	1,720	93

*The estimates of "state personal income" shown in this table differ in definition in one respect from the personal income data presented in Table IV of the article, Income and Product, U.S. This pertains to the exclusion from the state estimates of income disbursed by the federal government to its civilian and military personnel stationed outside the continental United States.

Source: United States Department of Commerce, Office of Business Economics.

Table V.—Distribution of Personal Income in the United Kingdom, 1955*

Range of income (in £)	Number of Incomes (in thousands)	Amount of income before tax (in million £)	Amount of income after income tax and surtax (in million £)
Under 250	8,000	1,450	1,447
250—500	7,900	2,990	2,880
500—750	6,500	3,980	3,750
750—1,000	2,350	1,990	1,820
1,000—1,500	875	1,050	895
1,500—2,000	240	410	323
2,000—5,000	274	800	537
5,000—10,000	48	320	154
Over 10,000	13	215	59
Total	26,200	13,205	11,865

*No account is taken of £2,558,000,000 accruing to persons which, for lack of information, could not be allocated to particular ranges of income.

†A married couple is for this purpose counted as a single income recipient.

Source: Central Statistical Office, National Income and Expenditure 1956 (H.M.S.O., London, 1956).

substantial progress they had made over the past quarter of a century, the 11 southeastern states in 1955 had a composite per capita income 35% below the average for all other states.

From 1929 to 1955, a period of tremendous economic growth, there was a pronounced relative shift of total income from the New England and middle east regions to the south and far west. As shown in Table IV, the rates of income expansion in the far west, southeast and southwest substantially exceeded the nationwide rise of 254%, whereas the gains in New England and the middle east fell far short of it. The combined proportionate share of the nation's total income received by the south and far west increased 38% from 1929 to 1955, while that of the northeastern area (New England and middle east) declined 20%. However, aggregate income in the populous, high average-income northeast in 1955 still accounted for one-third of the national total.

(See also BUDGET, NATIONAL; INCOME AND PRODUCT, U.S.)
(C. F. Sz.)

Weapons: see MUNITIONS.

Weather: see METEOROLOGY.

Weeks, Sinclair (1893—), U.S. cabinet member, was born at West Newton, Mass., on June 15. His father was John W. Weeks, secretary of war under Pres. Warren G. Harding. After graduating from Harvard university, Cambridge, Mass., in 1914, he worked for the First National bank of Boston, Mass., until 1923, except for a period during World War I when he served overseas as a captain with the 101st field artillery. He later became a successful manufacturer, was president of Reed and Barton, silversmith company of Taunton, Mass., and director of a number of large corporations.

Long active in Republican politics, he became a national committeeman for Massachusetts in 1940. He was treasurer of the Republican national committee from 1941 to 1944, and in the latter year served some months in the U.S. senate, on appointment to fill a vacancy.

In 1949 Weeks was chosen national finance committee chairman of the Republican party. On Jan. 21, 1953, he was sworn into office as secretary of commerce in Pres. Dwight D. Eisenhower's cabinet.

Weeks was involved in a dispute with the U.S. house of representatives' judiciary subcommittee in the summer of 1955 over his refusal to divulge records of the department of commerce's business advisory council. On April 26, 1956, he freed about 700 nonstrategic U.S. products for export to the U.S.S.R. and the "iron curtain" nations.

Weight Lifting. Paul Anderson, of Toccoa, Ga., representing the Whitfield Health club, broke three universal weight-lifting records as he retained his national Amateur Athletic union heavyweight title in 1956. Competing in the championships at the University of Pennsylvania's Palestra in Philadelphia, June 1-2, he also was awarded the title as Best

National Senior A.A.U. Championships

Class	Winners	Pounds lifted
123 lb.	Charles Vinci, York, Pa.	690
132 lb.	Isaac Berger, York	720
148 lb.	Joe Pitman, York	785
165 lb.	Clement Warner, Bethpage, N.Y.	835
181 lb.	Jim George, Akron, O.	875
198 lb.	Clyde Emrich, York	955
Heavyweight	Paul Anderson, Toccoa, Ga.	1,175

Lifter of the tournament. He hoisted 335 lb. snatching and 440 lb. in the clean and jerk test, each a world mark. These weights combined with a 400-lb. press gave him a total of 1,175 lb., a new world record. Anderson held the previous records of 1,145 lb. (total) and the 435-lb. clean and jerk set in the 1955 nationals.

Joe Pitman of Vero Beach, Fla., won the light-heavyweight title for the 10th time in succession, lifting 785 lb. Clement Warner of Bethpage, N.Y., won the 165-lb. crown. The team championship was captured by the York (Pa.) Barbell club for the 24th consecutive time.

Tommy Kono of Sacramento, Calif., and Hawaii, broke two light-heavyweight marks on March 9 in Honolulu while competing in the Hawaiian A.A.U. title meet. He pressed 317½ lb. to better the mark of 315¼ lb. set by the Russian, Gregory Novak, in 1949, then lifted a total of 977½ lb., bettering his own standard of 958¾ lb. Kono broke a world record for 181-lb. weight lifters on Oct. 12 in Honolulu with a clean and jerk lift of 382½ lb. Russians were reported to have set a number of new world standards during the year. E. Minayev, featherweight, hoisted 251.33 lb. in the two-hand press, bettering the 250.23 lb. made by Victor Korzh, also of the U.S.S.R. R. Vihabutdimor bettered his own lightweight standard by about a pound when he pressed 271.83 lb. V. Stogob, a flyweight, scored at 236.5 lb. in the press to beat his own mark by ½ kg. Kono's world mark of 902 lb. for middleweights was eclipsed in April when Fedor Bogdanovsky lifted a total of 913 lb. In June, Bogdanovsky had 293 lb. in the two-hand press for middleweights, to surpass a record held by Kono, and Nikolaj Kostilev bettered his own standard of 271 lb. for the lightweights' snatch when he lifted 275½ lb. Kono regained an international record in August when he pressed 295 lb. for a middleweight mark.

In Olympic trials at San Jose, Calif., in October the following were picked for the U.S. squad: Charles T. Vinci and Isaac Berger of York, Pa.; Pete and Jim George of Akron, O.; Tommy Kono; Dave Sheppard, Van Nuys, Calif., and Paul Anderson. (See also OLYMPIC GAMES.)

Ohio State won the team championship in the national collegiate tourney at Columbus, O., in April. The George brothers starred for the victors, Pete winning middleweight honours and Jim taking the light-heavyweight title. Ralph Brehm gave Ohio its third division prize by winning the featherweight championship. (T. V. H.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Weight Events* (1938).

Western European Union: see EUROPEAN UNION.

Western Samoa: see NEW ZEALAND; TRUST TERRITORIES.

West Indies, British: see BAHAMA ISLANDS; BARBADOS; BRITISH WEST INDIES; JAMAICA; LEEWARD ISLANDS; TRINIDAD AND TOBAGO; WINDWARD ISLANDS.

West Virginia. West Virginia was admitted to conditional statehood on Dec. 31, 1862, and proclaimed a state on April 20, 1863. It has an area of 24,282.45 sq.mi., including about 150 sq.mi. water surface. Pop. (July 1, 1956, provisional est.) 1,983,000; (1950 census) 2,005,552. In 1950 the urban population was 34.8% of the total. There were 113,735 Negroes and 33,640 foreign-born whites. Charleston, the capital city, had a population of 73,501. Other cities with 10,000 or more inhabitants in 1950 were: Huntington, 86,353; Wheel-

ing 58,891; Clarksburg, 32,014; Parkersburg, 29,684; Fairmont, 29,346; Morgantown, 25,525; Weirton, 24,005; Bluefield, 21,506; Beckley, 19,397; South Charleston, 16,686; Martinsburg, 15,621; and Moundsville, 14,772. Unincorporated South Parkersburg had a population of 10,808.

History.—In the face of a 250,000 majority of registered Democratic voters, Pres. Dwight D. Eisenhower, Republican, received about a 65,000 majority for re-election in West Virginia in 1956, and by slightly lesser majorities Chapman Revercomb (Rep.) was elected to the U.S. senate to complete the unexpired term of Harley M. Kilgore (deceased), and Cecil H. Underwood (Rep.) was elected governor. At the same time the Republicans took two of the state's six representatives in congress, but the state legislature remained with the Democrats—the senate 21 to 11 and the house of delegates 58 to 42. Other members of the board of public works elected in 1956 were: secretary of state, D. Pitt O'Brien; auditor, Edgar B. Sims; treasurer, Orel J. Skeen; attorney general, W. W. Barron; commissioner of agriculture, John T. Johnson, all Democrats; and state superintendent of free schools, R. Virgil Rohrbough (Rep.).

In the first budget session (Jan. 11–Feb. 10, 1956) under a new constitutional amendment, the 52nd legislature did much to make amends for its session of 1955. To provide overdue salaries to teachers on all levels and other state employees, the 1956–57 budget was increased about \$5,000,000, raising the total to about \$99,000,000. Revenue bills for these purposes included one to increase the tax on corporations and insurance agencies. By an act, later declared constitutional, the university was authorized to sell self-liquidating bonds in the sum of \$10,000,000 to be used for the construction of agricultural and mechanical engineering buildings, and Marshall college was authorized to sell \$950,000 worth of such bonds for the construction of a gymnasium. The legislature also appropriated \$60,000 to be used to make a study of proposed turnpike extensions. The study was made, but, awaiting the allocation of federal funds under the \$33,000,000-000 act of congress of 1956, no action was taken in the one-day extra session (Aug. 10) of the state legislature. The session did, however, approve an emergency appropriation for the purchase of equipment to replace part of that destroyed by fire in the mechanical engineering building at the university, and it authorized the National Science foundation to use a site near Green Bank, Pocahontas county, for the erection of telescopes for a proposed new "Window to the Universe." Except in the oil and timber industries, the state experienced an expanding economy. There was comparatively little industrial unrest; the opening of a forestry camp in Tucker county for youthful offenders was a new approach in dealing with juvenile delinquents. The public school desegregation program moved forward with little friction, except in two or three of the heavily Negro populated counties.

Education.—The total enrolment in the 3,090 elementary schools in 1955–56 was 295,905. In the 380 secondary schools (junior and senior) it was 162,003. Total receipts for the public school program were \$82,910,051.21, of which \$49,668,327 were regular state aid; \$1,672,214.60 were federal aid; \$29,952,683.61 were local collection; and \$457,959.57 were miscellaneous receipts.

There were nine state-supported institutions of higher learning under control of a state board of education, which, as of Sept. 30, 1956, had a total full-time enrolment of 9,274 and a total part-time enrolment of 2,842. The state also supported the board of governors-controlled university at Morgantown and Potomac State college at Keyser with respective total enrolments of 5,454 and 537 full-time and 635 and 44 part-time students. There were also nine senior and junior private and denominational colleges with a total full-time enrolment of 3,751 and a total part-time enrolment of 1,923.

Social Insurance and Assistance, Public Welfare and Related Programs.—In the year ending June 30, 1956, the state department of health supervised the expenditure of \$2,052,741, of which \$526,621 were federal grants; \$626,663 were state funds; \$871,509 were local funds; and \$27,948 came from private agencies. Public assistance departmental expenditures for the year totalled \$32,394,474.54 or \$2,064,360 less than for the year 1954–55. Items for 1955–56 were: aid to dependent children, \$15,615,798.88; old-age assistance, \$7,743,108.25; aid to permanently or totally disabled, \$3,154,326.00; personal service, \$1,413,960.56; general medical and hospitalization, \$1,278,924.71; boarding care, \$902,109.80; general assistance,

\$884,955.25; aid to crippled children, \$455,207.29; aid to the blind, \$445,161.00; current expenses, \$355,172.77; child welfare, \$92,231.61; prevention of blindness, \$37,188.70; and equipment, \$16,329.70.

Transportation and Communication.—As of Jan. 1, 1956, there were about 31,000 mi. of state road, of which about 5,000 mi. were primary and about 26,000 mi. were secondary. Including those in national forests, 1,682 mi. rural, and 2,400 mi. city streets, there were about 4,600 mi. not in the state system. There were 429,260 passenger motor vehicles and 111,290 trucks of various kinds registered in the year ending June 30, 1956. There were 35 radio stations and 4 functioning television stations.

Banking and Finance.—The total state receipts, including a gross cash balance of \$44,440,522.71 as of June 30, 1955, for the fiscal year ending June 30, 1956, was \$405,639,548.18, and the total disbursements were \$356,833,759.24, leaving a cash balance of \$48,805,788.94. The net cash balance was, however, only \$5,755,703.13, of which \$3,531,565.03 were encumbered. The chief sources of state income were: gross sales tax, \$42,870,770; federal aid, \$34,024,652; consumers sales tax, \$28,185,207; gasoline tax, \$26,587,226; and auto licence tax \$15,156,787. The largest state expenditures were: \$69,352,065, or 36.13%, for schools; \$48,122,283, or 25.07%, for highways; and \$42,000,516, or 21.89%, for health and welfare. As of June 30, 1956, the total bonded indebtedness of the state was \$135,212,000, of which \$79,052,000 was for roads and \$56,160,000 was for veterans.

As of June 30, 1956, the total resources of 76 national banks were \$602,109,000 and of 105 state banks and trust companies, \$579,509,019.24. The respective resources of 22 federal and savings loan companies, 15 state banking and loan associations, and 31 industrial savings and loan companies were: \$105,542,961, \$25,428,715.38, and \$23,010,991.99. There were 180 small loan companies with total resources of \$37,698,934.58 and 24 state chartered credit unions with total resources of \$2,123,614.61.

Agriculture.—The total cash farm income for 1955 was \$112,303,000, or \$6,929,000 less than for 1954. Of the total cash income for 1955, \$1,704,000 was government payments; \$86,600,000 was for livestock and livestock products; and \$23,999,000 was for crops. The value of products consumed on the farms where produced was \$39,442,000, making a total gross farm income of \$151,745,000, or \$9,681,000 less than for 1954.

The estimated number of cattle on farms, 593,000, as of January 1, 1956, was about the same as for the corresponding date for 1955. The 170,000 hogs were about 30,000 more; the 314,000 sheep were about the same;

Table I.—Principal Agricultural Products of West Virginia

Crop	Indicated 1956	1955	Average, 1945-54
Apples, commercial, bu.	4,050,000	4,346,000	3,832,000
Barley, bu.	562,000	462,000	358,000
Corn, bu.	7,990,000	7,293,000	9,889,000
Hay, all, tons	988,000	986,000	994,000
Oats, bu.	1,332,000	1,520,000	1,511,000
Peaches, bu.	650,000	800,000	578,000
Potatoes, cwt.	780,000	1,053,000	952,000
Tobacco, lb.	3,938,000	4,000,000	4,070,000
Wheat, bu.	888,000	851,000	1,333,000

Source: W. Va. Department of Agriculture, General Crop Report, Oct. 1, 1956.

working stock, horses and mules, continued its downward trend, 62,000 to 58,000; and the 2,823,000 chickens were 3% less; but the number of turkeys, 71,000, was 3,000 more than on Jan. 1, 1955. The farm value of the livestock was \$42,636,000; chickens \$3,246,000 and turkeys, \$370,000.

Manufacturing.—1955 was the peak year in the total value of manufactured products, \$2,106,000,000, or \$231,000,000 more than for 1951, the previous peak year. The average monthly employment for 1955, 128,700, was however 9,700 less than for 1951, indicating that the 1955 total was due to increased production per worker and to higher prices rather than to manufacturing expansion. The average monthly employment for 1951 was

Table II.—Principal Industries of West Virginia

	All em- ployees 1954	Salaries and wages 1954 (in 000s)	Value added by manu- facture 1954 (in 000s)	Value added by manu- facture 1953 (in 000s)
Textile mill products	3,056	\$ 8,664	\$ 11,371	\$ 15,016
Paper and allied products	1,589	5,276	9,143	8,561
Chemicals and allied products	21,741	111,459	320,419	352,696
Petroleum and coal products	2,462	11,575	29,009	28,275
Stone, clay and glass products	23,690	87,098	138,018	147,144
Primary metal industries	20,010	97,892	185,988	251,220
Fabricated metal products	8,449	31,247	53,517	56,826
Electrical machinery	4,320	15,305	38,925	54,679

*Withheld because the estimate did not meet publication standards, either on the basis of the associated standard error of estimate or on the basis of a consistency review.

Source: U.S. Department of Commerce, 1954 Census of Manufactures, preliminary report.

138,400. The 37,875 employees (1956) in chemical and related industries were 1,259 more than in 1955 and their total annual wage, \$168,074,274, was \$14,723,937 more, but chief interest centred in a rehabilitation of the coal industry. By improved organization and mechanization the total production for 1955 was increased 20% to 142,000,000 tons which was 34,000,000 less than for 1947, the record production year, when the average monthly employment was 38,000 more. The estimated average monthly employees for 1956 was 76,130 and the total estimated annual payroll was \$374,173,813, or only about \$4,000,000 less than in 1947. Average monthly employees and total annual payroll in other industries were: iron and steel, 41,145 and \$204,646,847; glass, pottery, brick and tile, 27,051 and \$103,901,405; oil and gas, 12,027 and \$42,620,577; and lumber, 9,858 and \$21,846,824. (C. H. A.)

Mineral Production.—Table III shows the tonnage and value of those minerals produced in West Virginia in 1953 and 1954 whose value was \$100,000 or more. In 1954, West Virginia led all the states in coal production, had a large output of natural gas, and ranked sixth in the value of its mineral output, with 4.56% of the U.S. total.

Table III.—Mineral Production of West Virginia

(In short tons, except as noted)

Mineral	Quantity	Value	Quantity	Value
	1953	1954	1954*	1954*
Total		\$790,110,000		\$636,311,000†
Clays	969,000	2,489,000	578,000	1,451,000
Coal	134,105,000	693,594,000	115,996,000	541,370,000
Coke‡	4,477,000	53,487,000	3,747,000	45,601,000
Natural gas (000 cu.ft.)	186,477,000	44,009,000	191,601,000	45,601,000
Natural gasoline (000 gal.)	44,000	3,245,000	41,000	2,593,000
Petroleum (bbl.)	3,038,000	11,570,000	2,902,000	8,500,000
Petroleum gases (000 gal.)	153,000	6,743,000	143,000	5,035,000
Salt	420,000	1,491,000	472,000	2,886,000
Sand and gravel	3,163,000	6,071,000	4,074,000	8,351,000
Stone	5,501,000	8,924,000	7,315,000	11,743,000
Other minerals . . . . .	...	11,974,000	000	10,504,000

*Preliminary.

†Total has been adjusted to eliminate duplication in the value of clays and stone.

‡Values for processed materials are not included in the totals.

Source: U.S. Bureau of Mines.

ENCYCLOPÆDIA BRITANNICA FILMS.—*Northeastern States*, 2nd ed. (1955).

Wheat. Once again the enduring U.S. wheat crop surmounted a diversity of unfavourable situations, some local, some widespread, to mature an abundant harvest of 975,517,000 bu. in 1956, 4% larger than in 1955, but 15% less than the 1945-54 average. Total harvested acreage was 50,466,000 ac., nearly 7% more than in 1955, but far less than the 67,192,000-ac. average for 1945-54. Yields averaged 19.3 bu. per acre, as compared with 19.8 bu. in 1955 and the 17.1 bu. per acre average for the previous decade.

The fall sown winter wheat crop was seeded on 45,203,000 ac., 2% more than a year earlier, but about 20% less than the ten-year average. Early estimates were for about 735,438,000 bu. for harvest in 1956. By June the official forecast was for only about 670,000,000 bu. However, timely rains at filling time resulted in unexpectedly good yields, and the semifinal estimate of the 1956 winter wheat crop was 721,946,000 bu., as compared with 703,047,000 bu. in 1955 and the 873,690,000-bu. average for 1945-54.

An excellent harvest of durum wheat did much to restore depleted supplies of this macaroni grain. The U.S. crop of 39,114,000 bu. was nearly double the 20,070,000 bu. of 1955 and one-fourth larger than average. North Dakota was the leading producer with 20,848,000 bu., but Montana, with 16,071,000 bu., had the biggest increase as compared with 1955.

An increase in hard red winter wheat to 436,298,000 bu. from 418,603,000 bu. in 1955 practically equalized a decline in hard red spring wheat to 169,463,000 bu. from 187,112,000 bu. in 1955. Soft wheats increased, soft red to 177,342,000 bu. (168,400,000 bu. in 1955) and white to 153,292,000 bu. from 142,565,000 bu. in 1955.

The U.S. supply of wheat for the 1956-57 marketing year was indicated at 2,015,000,000 bu. a new all-time record. Included were 1,030,000,000 bu. of carry-over stocks (mostly held by the Commodity Credit corporation), four times as large as in 1952 and made up predominantly of hard red winter wheat desirable for breadmaking. Domestic disappearance was ex-

Table I.—U.S. Wheat Production by Leading States

(In 000 bu.)

State	Indicated 1956	1955	Average, 1945-54
Kansas	144,600	128,395	202,873
North Dakota	117,600	112,942	122,990
Montana	74,749	109,350	80,798
Oklahoma	64,272	24,160	77,872
Nebraska	60,211	78,255	80,211
Washington	59,963	55,832	72,626
Illinois	58,108	52,008	36,561
Missouri	49,320	48,081	27,976
Ohio	39,286	43,384	52,243
Idaho	38,980	38,165	38,985
Indiana	35,220	34,394	35,555
Michigan	30,474	27,966	32,105
Texas	28,275	14,326	50,722
Oregon	25,828	21,899	26,804
South Dakota	17,986	27,461	42,288
Colorado	17,119	17,257	42,984
Minnesota	16,599	12,186	18,579
Pennsylvania	15,903	15,964	19,832

pected to continue at about 600,000,000 bu., including 483,000,000 bu. used for food, 55,000,000 bu. for seed and 60,000,000 bu. for feed. Exports were forecast at 415,000,000 bu., as compared with 345,000,000 bu. in the year ending July 1, 1956. Thus, it appeared that carry-over supplies on July 1, 1957, might be moderately reduced, after increasing since 1952.

As regards the 1956 wheat acreage participation in the acreage reserve of the soil bank, wheat farmers signed 162,574 agreements covering 5,654,507 ac. for possible payments of more than \$44,000,000. Marketing quotas were again favoured, for the third year, by 87.4% of the farmers voting in July in all commercial wheat states. The acreage allotment for 1957 was again based on 55,000,000 ac. and the average support price set at \$2 per bushel.

In October, producers of wheat received \$1.98 per bushel, slightly above the \$1.94 per bushel of Oct. 1955, but slightly less than the average support price of \$2 per bushel (84% of parity), changed from \$1.81 per bushel or 76% of parity as first announced. In November it appeared that perhaps not more than 250,000,000 bu. of the 1956 crop wheat would seek shelter under the support program, as compared with 321,000,000 bu. from the 1955 crop.

U.S. exports of wheat and flour in 1955-56 amounted to 341,000,000 bu., valued at \$573,089,000, as compared with 274,000,000 bu. valued at \$492,195,000 in 1954-55. Much of that total moved under the International Wheat agreement or under other subsidy programs. A large deal with India involved about 3,500,000 tons of wheat, one-fifth to be shipped in 1956-57.

Table II.—World Production of Wheat for Selected Areas

Country	(in 000,000 of bu.)				
	Est. 1956	1955	1954	Average, 1945-49	Average, 1935-39
United States	976	937	985	1,202	759
Canada	535	494	309	363	312
Mexico	40	32	31	16	14
Free Europe	1,195	1,384	1,327	947	1,136
Other Europe	380	426	378	318	464
United Kingdom	107	97	104	78	62
Union of South Africa	32	29	22	15	16
Asia	1,860	1,885	1,860	1,600	1,575
India	312	328	295	212	262
Turkey	220	261	180	125	136
Pakistan	127	118	138	129	117
Argentina	220	193	283	194	222
Australia	130	196	169	178	170
U.S.S.R.				885	1,240
World total	7,545	7,405	7,010	5,911	6,102

The world wheat crop of 1956-57 was preliminarily forecast at 7,510,000,000 bu., a new record high, comparable with 7,380,000,000 bu. in 1955-56, a 1945-49 average of 5,910,000,000 bu., and a pre-World War II average crop of 6,100,000,000 bu. The important Canadian export crop was 535,000,000 bu.—a good outturn, but far below the record. The western European crop, hard hit by a winter freeze and plagued with a wet harvest period, was nearly 200,000,000 bu. short of the 1955 level as well as lower in quality. Increased imports were indicated. The situation in eastern Europe and the U.S.S.R. was not fully known, but the crop was announced as a record one with 56,000,000 tons delivered to the state by early October. Instead of the substantial purchases made by the Soviet bloc countries early in 1956, wheat deals were announced by the U.S.S.R. with Egypt and Poland.

World wheat trade in 1955-56 was about 1,020,000,000 bu., 6% above 1954-55, 11% more than the average for the previous decade, and only 4% below the record of 1,066,000,000 bu. in 1951-52. Larger exports were anticipated in 1956-57, partly because of pressure of stocks and partly because of the reduced 1956 crop in western Europe.

The Third International Wheat agreement after prolonged discussion became effective on Aug. 1, 1956, to extend through July 31, 1959. It followed the same general pattern as the two

earlier agreements. Argentina and Sweden joined as exporters, bringing the number to six, with the following export quotas: United States, 132,100,000 bu. (as compared with 196,500,000 bu. under the previous agreement); Australia, 30,300,000 bu. (45,000,000 bu. previously); Canada, 102,900,000 bu. (153,100,000 bu.); France, 16,500,000 bu. (344,000 bu.); Sweden, 6,400,000 bu.; and Argentina, 14,700,000 bu.

Thus, countries which supply about 90% of the wheat moving in world trade contracted for about one-third of the total anticipated trade.

The United Kingdom again refrained from joining, but 34 importing countries signed and 32 ratified promptly. The minimum price, at which importing countries are obliged to take up their quota, was lowered to \$1.50 per bushel from \$1.55 under the preceding contract. The maximum price, at which exporters are obligated to sell their annual quotas, was also reduced by 5 cents, to \$2 per bushel.

Flour.—U.S. consumption of wheat flour, including white, whole wheat and semolina, was 119 lb. per capita, about 2% less than in 1955 and only about three-fourths as much as prewar. Use of rye flour declined to 1.3 lb. per person, 59% of the 1935-39 average. Breakfast cereals required an additional 2.8 lb. per capita of processed wheaten substance, but even that was 15% below prewar.

Flour exports in 1955-56 were 21,564,000 cwt. wheat equivalent, valued at \$91,466,000, as compared with 19,884,000 cwt., valued at \$86,990,000 in the previous year.

A study of costs of marketing breads found consumers paying 70% more than ten years before, with charges for processing and distributing up 87%, and returns to farmers for wheat and other bread ingredients up 20%.

The ending of the U.K. bread subsidy in September was followed by severe price wars with respect to bread and flour.

(J. K. R.)

ENCYCLOPEDIA BRITANNICA FILMS.—*The Wheat Farmer*, 2nd ed. (1956).

Wildlife Conservation. Interest in wildlife in the United States in 1956 was especially in evidence in efforts to provide better protection for refuge areas, to rescue from threatened extinction the rare whooping crane, to establish a sound federal governmental organization and to relate wildlife conservation to the farm programs encouraged in congressional legislation.

Writing on soil bank legislation in *The Living Wilderness*, Charles Callison, conservation director of the National Wildlife federation, pointed out that "for the first time in general farm legislation the inseparable relationship of wildlife to land use, and the importance of wildlife resources, were recognized." "Congress," Callison explained, "took a plan designed to whittle down problem crop surpluses by paying farmers for taking croplands out of production and wrote a law that spelled out comprehensive objectives in 'soil, water, forest, and wildlife conservation,' " authorizing the use of "practices to enhance wildlife and forest resources, along with soil and water conservation practices on the 'conservation reserve' lands."

At the same time special attention was being paid to the organization of the executive department agencies that deal with the federal wildlife program. Under public law 1024, which became effective on Nov. 6, 1956, two bureaus—one for commercial fisheries and the other a bureau of sport fisheries and wildlife—were established within a reorganized fish and wildlife service. The service was to be administered by a commissioner of fish and wildlife. Within the department of the interior, where these agencies are administered, there was established a new position of assistant secretary for fish and wildlife.



HERDING BY HELICOPTER, members of the Washington state game department directing elk over snowy hills to feeding grounds in Jan. 1956

On Dec. 16 Secretary of the Interior Fred A. Seaton announced that the reorganized fish and wildlife service had been asked to "develop a blueprint for a greatly broadened conservation program," on which a special task force was shortly to begin work. Two goals emphasized by the secretary in his announcement were "to solve problems of destructive drainage threatening marshes and wetlands for migratory waterfowl, and to initiate a planned program of land acquisition to meet federal and state needs in wildlife management."

Bills to provide for the acquisition of waterfowl areas by using for the purpose 40% of the receipts from the sale of the federal migratory bird hunting stamps—the so-called "duck stamps" required of all wildfowl hunters over 16 years of age—had been introduced in the 84th congress and discussed at hearings. In the face of opposition by the executive agencies, however, these bills had not been enacted and in reintroduced forms were looked upon by conservation leaders as among the important considerations for the 85th congress.

Threats to the federal refuges from demands for commercial use were increasingly alarming as permits for oil and gas leases were issued under a severely criticized policy of the department of the interior. Refuge threats from the encroachments of the expanding military organization were also exposed and opposed by conservation organizations. Notable was a plan to take part of the Wichita Mountains Wildlife refuge as an addition to Fort Sill near Lawton, Okla., a plan that had successfully gone through the 1955 session of congress in a military public works bill but was frustrated by Secretary of the Interior Douglas McKay, who refused to transfer custody of the wildlife lands to the army. A 1956 bill that would have forced the secretary to make the transfer failed after hearings had been held by the house of representatives.

Approximately 20 of the national wildlife refuges and ranges containing extensive areas of wilderness were included in a proposed national wilderness preservation system advocated by Sen. Hubert Humphrey and Rep. John P. Saylor and other legislators and conservation leaders. Proposed legislation to create the wilderness system—which would comprise in all about 163 areas, including also units within the national park system and the national forests—was introduced in June in both senate and house of representatives and was widely circulated and discussed as a major concern for the 85th congress.

Determination to prevent the extinction of any more of the continent's wildlife species was demonstrated in efforts to preserve the whooping crane, a magnificent white bird that by about 1940 had dwindled to a total of only 15 known individuals on the continent. The principal remaining wintering ground of these birds on the Aransas (Gulf coast) peninsula in Texas was established as a federal refuge in 1937, and special efforts through

the years had been made to protect the birds during their migration between wintering grounds and their nesting areas in the remote Canadian wilderness. An increase to 34 birds by 1950 had been followed by decreases and fluctuations, between totals of 21 and 28. By mid-Dec. 1956 only about two dozen of the birds had returned south, but fish and wildlife service officials were confident that others would still be noted. Canadian and U.S. officials and conservation leaders and biologists met at a special conference in Washington, D.C., on Oct. 29, 1956, to consider the whooping crane restoration program.

A fish and wildlife service national survey carried out by Crossley, S-D Surveys, Inc., of New York concluded that approximately 11,784,000 persons in the United States had hunted in 1955 for a total calculated at 169,423,000 man-days, travelling 6,072,296,000 mi. and spending about \$936,687,000.

Other estimates indicated that hunters annually take about 12,500,000 ducks, 900,000 geese, 900,000 coots and nearly 1,400,000 big-game animals, in addition to millions of rabbits, squirrels, pheasants, quails, doves and grouse.

(See also NATIONAL PARKS AND MONUMENTS.) (H. Z.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Conservation of Natural Resources* (1937); *Deer Live With Danger* (1954).

Wilson, Charles Erwin (1890–), U.S. business executive and government official, was born on July 18 at Minerva, O. After graduating from the Carnegie Institute of Technology, Pittsburgh, Pa., in 1909, he went to work as an electrical engineer for the Westinghouse Electric and Manufacturing company, where he designed the first automobile self-starting motor produced by that company. He joined General Motors corporation in 1919 as an executive of one of the subsidiary companies; in 1929 he became a vice-president of the corporation and in 1941 president. Both during and after the war period he continuously pointed to the need for a permanent U.S. defense program that could be diverted speedily to war or peace production with a minimum of economic dislocation.

Wilson (sometimes confused with Charles Edward Wilson, president of General Electric company and director of defense mobilization from 1950 to 1952) was chosen for the post of secretary of defense by Pres. Dwight D. Eisenhower and was confirmed in that office by the U.S. senate in Jan. 1953 after he had agreed to sell his stock in General Motors Corp.

His major concern during 1953–56 was to attain economy in defense expenditures without materially impairing the national security; a related problem was to keep the relative strengths of the three armed services in balance. The political and economic delicacy of both problems, plus Wilson's famed inclination to forthright, colourful and often blunt comment, led him into several public controversies. Thus, on June 21, 1956, he de-

scribed as "phony" the efforts of some senators to appropriate more money for the air force than had been requested by President Eisenhower for the fiscal year 1957. This comment (like his famous "bird dog" and "kennel-fed dog" contrast between types of unemployed workers in 1954) brought denunciation from a number of Democratic and some Republican leaders, but Wilson was consistently backed up by President Eisenhower.

Windward Islands. The British colonies of Grenada, St. Vincent, St. Lucia and Dominica, forming the southern part of the Lesser Antilles in the Caribbean, constitute the British Windward Islands. The colonies have in common governor and (with Leewards) supreme court, but separate legislatures. Pop. (1955 est.) 308,000; 95% Negro and

Colony	Area (sq.mi.)	Population (1946 census)	Population (1954 est.)	Capital (with pop., 1954 est.)
Grenada	133*	72,387	85,300	St. George's† 5,774 ‡
St. Vincent	150*	61,647	75,190	Kingstown 5,791
St. Lucia	233	70,113	86,219	Castries 8,576
Dominica	305	47,624	59,000	Roseau 9,752‡
Total	821	251,771	305,709	

*Including the Grenadines attached in part to Grenada and in part to St. Vincent.
†Seat of governor. ‡1946 census.

mixed, some Caribs on St. Vincent and Dominica. Language: English; on Dominica and St. Lucia also French patois. Religion: Christian. Governor in 1956: C. M. Devereil. Administrators: (Grenada) W. Macmillan; (St. Vincent) A. F. Giles; (St. Lucia) J. K. R. Thorp; (Dominica) H. L. Lindo.

History.—With the introduction of a ministerial system of government in March 1956, another milestone in the constitutional advancement of the islands was reached. The inaugural meeting of the newly formed Federal Labour party, under Norman Manley of Jamaica, was held in St. Lucia and was attended by James Griffith of the United Kingdom Labour party.

Dominica continued to make good progress not only in the banana and citrus industries but also in the development of roads and buildings. The newly built Princess Margaret hospital satisfied a long-felt and pressing need. The Grenada rehabilitation program, especially in the field of agriculture, also made good progress, and regular shipments of bananas were again being made. Everywhere there were signs of recovery from the effects of the hurricane of 1955.

Colony	Budget (1956 est.)	External Trade (1955)
	Revenue* Expenditure*	Imports Exports
Grenada	B.W.I. \$4,367,641 B.W.I. \$4,085,879	B.W.I. \$10,339,920 B.W.I. \$8,746,845
St. Vincent	2,186,423 2,467,258	6,309,073 3,744,500
St. Lucia	2,785,154 2,850,469	6,375,050 3,908,499
Dominica	1,815,351 2,068,995	5,700,000 4,653,869

*Excluding grants-in-aid and grants and expenditure from the Colonial Development and Welfare fund.

(L. C.-LA.)

Education.—Schools (1955) *Grenada*: primary 53, pupils 18,445; secondary 6. *St. Vincent*: primary 41, pupils 16,249; secondary 2, pupils 478. *St. Lucia*: primary 49, pupils 15,290; secondary 2, pupils 623. *Dominica*: primary 58, pupils 11,732; secondary 4. One teacher training school.

Finance and Trade.—Monetary unit: British West Indian dollar: (B.W.I. \$4.80=£1 sterling. B.W.I. \$1.7=£1 U.S.).

Main exports: arrowroot, bananas, citrus products, cocoa, copra, sea island cotton, mace and nutmeg, sugar, vanilla.

ENCYCLOPÆDIA BRITANNICA FILMS.—*Caribbean* (1955).

Wines. Total world wine production during 1956 amounted to 5,864,800,000 gal. according to official reports and estimates, compared with 6,077,200,000 gal. during 1955 (a more accurate figure), an approximate 3½% decrease. Some figures, notably those from Soviet-influenced countries, were pure estimates.

During the winter of 1955-56 persistent and extreme cold which spread over western Europe, extending as far south as the Mediterranean, severely damaged the vines and curtailed production. As a result, for the first time in many years, France's wine production was second to that of Italy. Austria, Germany

World Production of Wine

(Millions of gallons)

Country	1956	1955	1951-1955 Average	1956 quality
Algeria	475.0	380.0	412.0	Inferior to 1955
Argentina	354.3	466.5	333.7	Average
Australia	27.5	32.3	36.2	Very high
Austria	9.2	30.7	28.1	Good
Brazil	39.6	21.6		
Bulgaria	18.0	11.3		
Canada	6.0	6.1	5.3	Normal
Chile	118.8	102.9	86.1	Normal
Colombia	0.2*	0.2*		
Cyprus	3.3*	3.3*		
Czechoslovakia	8.0	10.8*		
Egypt	0.8*	0.8*		
France	1,400.0	1,585.8	1,473.0	Passable
Germany	22.4	63.6	71.5	Superior to 1955
Greece	122.0	117.0	109.2	
Hungary	92.0	118.7*		
Iran	0.1	0.1		
Israel	2.5	2.1	1.6	Above average
Italy	1,580.0	1,546.5	1,299.5	Inferior to 1955
Japan	1.7*	1.7*		
Lebanon	0.8*	0.8*		
Luxembourg	2.7*	2.7*		
Malta	1.3*	1.3*		
Mexico	0.3*	0.3*		
Morocco	50.5*	50.5*	38.6	
Netherlands	0.1*	0.1*		
New Zealand	0.6*	0.6*		
Peru	3.2*	3.2		
Portugal	266.0	302.4	270.0	Poor
Rumania	103.0	105.5*		
South Africa	85.6	75.9	67.5	
Spain	488.4	440.0	477.3	
Switzerland	12.5	21.1	20.1	Fair
Syria	0.1	0.1		
Tunisia	26.0	27.8*	21.6	No variation
Turkey	6.2	6.6	5.5	
U.S.A.	143.0	159.1	141.3	No variation
Uruguay	25.6*	25.6*		
U.S.S.R.	237.5	211.0		
Yugoslavia	130.0	140.6		
Total	5,864.8	6,077.2	5,497.9	

Countries such as the United States, marked "No variation" in the above table, produce uniform wines from year to year because of stable climatic conditions and methods of production used.

*Provisional figure, same as previous year.

and Switzerland also suffered greatly.

In addition, the summer months were cool and damp so that in general the quality of the vintage was inferior to that of 1955.

Bordeaux produced a total of 143,000,000 gal. in 1955, of which 48,300,000 gal. white and 33,900,000 gal. red were famous growths (*appellation contrôlée*). The forecast for 1956 was a total of 100,000,000 gal. of fair quality. Many vines were frozen to the extent that they had to be uprooted so that future production was expected to suffer for at least five years. In 1955 Burgundy produced 56,800,000 gal. of which 5,600,000 gal. white and 23,900,000 gal. red were famous growths. The 1956 estimate was for approximately 20,000,000 gal. of good quality. Although frost curtailed production the vines were basically undamaged. Alsace produced 21,200,000 gal. of which 15,100,000 gal. were fine growths in 1955. The 1956 estimate was for only 11,500,000 gal. of medium quality. Champagne was down from the 20-year high of 15,400,000 gal. in 1955 to 7,500,000 gal. of fair quality in 1956. As a result of the extremely small yield of these world-famous areas, prices doubled.

Italy produced somewhat more wine than in 1955 but of mediocre quality. In Spain the Jerez district produced 13,200,000 gal. of excellent quality sherry, 25% more than 1955. Production of port wine, controlled to world demand in Portugal, was held to 6,900,000 gal. of fine wines as against 5,700,000 gal. in 1955, and Madeira produced 2,200,000 gal. of satisfactory quality compared with 3,100,000 gal. the previous year.

Germany also suffered from the prolonged freezing weather, experiencing a 45% decline in production. However, the quality greatly surpassed expectations. United States production was down 10% from 1955, but was still higher than the five-year average.

(J. WE.)

Wisconsin. One of the north central states of the United States, Wisconsin, popularly called the "Badger state," entered the union as the 30th state in 1848. Area: 56,154 sq.mi., of which 1,449 sq.mi. is water. Pop.: (1950 census) 3,434,575; (July 1, 1956, provisional est.) 3,764,000; of the 1950

population, 57.8% was defined as urban. Capital, Madison (1950 census), 96,056. Milwaukee, 637,392, is the largest city. Other large cities are Racine, 71,193; Kenosha, 54,368; Green Bay, 52,735; and La Crosse, 47,535.

History.—Many important measures approved by the 1955 legislature took effect during 1956. The new criminal code, representing the first complete revision of the substantive criminal law of Wisconsin since it became a state, became effective July 1, 1956. Louisiana was the only other state which had revised its code; Wisconsin was the only state to make such a change in recent years. Two other significant events also took place on July 1, 1956. The completely revised and modernized children's code became effective—the first revision since 1931—and the former Wisconsin State college and the University of Wisconsin extension division in Milwaukee were merged and became a full-fledged university branch with a new name, the University of Wisconsin—Milwaukee. Day enrolment for its first semester of operation in the fall of 1956 totalled 4,481.

Wisconsin had a lively political year. After the Republican convention refused to endorse Sen. Alexander Wiley for reelection, and Robert C. Zimmerman for secretary of state, a hotly contested primary battle developed with Rep. Glenn Davis failing to unseat Senator Wiley and the incumbent, Mrs. Glenn A. Wise, failing to win the nomination from Zimmerman. On the Democratic side, Robert LaFollette Sucher, grandson of old "Fightin' Bob" LaFollette, won the nomination for attorney general over party regular Frank Nikolay. Shortly before the deadline for filing candidacies for the general election, William Proxmire, Democratic candidate for governor, denounced Sucher and gathered enough signatures on petitions to place Nikolay on the November ballot as an Independent.

Despite the splits within both parties, the Republicans swept all state offices in the November election: Atty. Gen. Vernon Thomson won the gubernatorial race, Lieut. Gov. Warren P. Knowles and Treas. Warren R. Smith were re-elected. Stewart Honeck was elected attorney general and Robert C. Zimmerman, like his father before him, led the state ticket in number of votes as he won the office of secretary of state. Senator Wiley, six Republican and three Democratic representatives were re-elected. Donald Tewes, a Republican, won Congressman Glenn Davis' seat in the house. The Democrats gained two seats in the state senate; the Republicans gained three seats in the assembly, leaving both houses with approximately a two-thirds Republican majority. In the voting for president, more than 900,000 Wisconsin voters cast their ballots for Pres. Dwight D. Eisenhower, while Adlai E. Stevenson polled somewhat more than 550,000 votes.

Education.—In the school year 1954-55, there were 5,131 elementary schools, 448 secondary schools, and 23 county teachers colleges. Enrolment in the elementary schools totalled 431,546; secondary schools, 169,676; county teachers' colleges, 1,255. Elementary schools employed 16,347 teachers; secondary schools, 7,592; county teachers' colleges, 111. State aids to education for 1954-55 were \$28,514,627. Expenditures in elementary and secondary schools amounted to \$201,695,259. The 11 state colleges employed 790 faculty members to teach 12,252 college and 2,327 training school students.

Social Insurance and Assistance, Public Welfare and Related Programs.—Cases receiving public assistance as of June 30, 1956, with expenditures for the fiscal year ending on that date in parentheses, were as follows: general relief, 7,467 (\$8,277,731); old-age assistance, 41,400 (\$33,352,789); aid to the blind, 1,112 (\$954,459); totally and permanently disabled, 1,210 (\$1,379,795); dependent children in their own or a relative's home, 8,097 (\$13,856,832); dependent children in foster homes, 1,645 (\$1,091,031); a total of 60,931 households (\$58,912,637). Civilian unemployment benefits for the fiscal year 1955-56 were \$21,365,152; contributions collected totalled \$24,254,450.

The cost of operating Wisconsin's 12 charitable, correctional and mental institutions for the year ending June 30, 1956, was \$15,267,213 appropriated from the general fund, plus \$5,560,627 for postwar construction and development. The average daily population for June 1956 was 6,272.

Communications and Transportation.—Public highways as of Jan. 1, 1956, totalled 95,754 mi. divided as follows: 85,784 (towns), 2,725 (villages), 7,245 (cities). Expenditures by the highway commission during the fiscal year 1955-56 amounted to \$118,365,224. Railway mileage (steam and electric) as of Dec. 31, 1955, was 6,402.83 with 69.02 mi. of trolley



MOVING AN ISLAND, power boats push and pull a three-acre land mass which broke away from the shore of Moraine lake near Fond du Lac, Wis., in May 1956. The unwanted island was blocking the beach of a resort until the extraordinary effort was made to move it to another spot on the lake

(trackless) route in Milwaukee. On Jan. 1, 1956, there were 1,218,268 telephones; on Oct. 1, 1956, there were 64 publicly owned airports and seven seaplane bases. Total marine tonnage for 1955 amounted to 92,929,760 short tons.

Banking and Finance.—As of June 30, 1956, the 95 national banks had deposits of \$1,649,289,000 and assets of \$1,786,000,000. At the end of the calendar year 1955, 462 state banks (one less than in the previous year) reported deposits of \$2,022,109,458. Assets amounted to \$2,184,249,509. Credit unions increased from 680 in 1954 to 696 in 1955. Assets amounted to \$120,562,491 which was an increase of 17.5%. The 114 savings and loan associations listed assets of \$666,777,759.

State receipts for the fiscal year 1955-56 were \$308,851,039; disbursements \$295,890,961. Taxes collected and returned to local subdivisions totalled \$91,598,469; agency collections returned to localities were \$3,095,549; state aids totalled \$85,717,927; moneys transferred from the general fund to other funds amounted to \$17,187,123.

Agriculture.—The total acreage harvested in 1955 was 10,124,000. Cash receipts amounted to \$974,276,000, consisting of \$855,444,000 from livestock and livestock products and \$118,832,000 from crops. Total acreage harvested dropped slightly below that for 1954. Crop values declined because of lower farm prices. Wisconsin's commercial onion crop had the highest per acre value of any crop in the state; rye had the lowest value per acre.

Table 1.—Principal Crops of Wisconsin

Crop	Indicated 1956	1955	Average, 1945-54
Corn (bu.)	160,486,000	137,000,000	126,847,000
Oats (bu.)	129,122,000	138,915,000	130,537,000
Tobacco (lb.)	27,748,000	32,221,000	46,722,000
Potatoes (cw.)	7,105,000	6,552,000	7,548,000
Barley (bu.)	2,482,000	2,590,000	5,447,000
Wheat (bu.)	1,350,000	1,419,000	2,164,000
Flaxseed (bu.)	69,000	62,000	145,000
Soybeans (bu.)	1,302,000	975,000	558,000
All hay (tons)	8,036,000	8,401,000	7,197,000
All clover and timothy (tons)	2,327,000	2,718,000	3,479,000
Alfalfa (tons)	5,528,000	5,499,000	3,389,000
Cherries (tons)	14,000	21,700	14,120
Cranberries (bbl.)	280,000	315,000	199,200
Apples (bu.)	1,230,000	1,380,000	1,072,000

Source: U.S. Department of Agriculture.

Manufacturing.—The total value of manufactured products in Wisconsin dropped from \$3,635,768,000 in 1953 to \$3,314,109,000 in 1954. In 1955 the estimated average number of wage earners in Wisconsin manufacturing establishments was 450,000 as compared with 432,900 in 1954 and 472,500 in 1953. The average weekly gross earnings per capita were \$80.61 in

Table II.—Principal Industries of Wisconsin

	All employees 1954	Salaries and wages 1954 (in 000s)	Value added by manu- facture 1954 (in 000s)	Value added by manu- facture 1953 (in 000s)
Food and kindred products	60,709	\$228,005	\$482,358	\$519,249
Textile mill products	7,562	24,404	39,101	39,379
Apparel and related products	8,147	22,578	36,055	40,435
Lumber and products (except furniture)	17,759	55,423	84,617	105,220
Furniture and fixtures	10,643	41,410	64,076	65,314
Paper and allied products	33,304	145,435	320,515	301,273
Printing and publishing industries	20,032	88,520	136,216	136,120
Chemicals and allied products	8,985	40,684	97,554	*
Leather and leather products	17,510	58,821	91,040	94,599
Primary metal industries	25,380	119,235	194,765	205,454
Fabricated metal products	32,429	141,130	253,495	285,463
Machinery (except electrical)	84,608	407,546	711,758	764,869
Electrical machinery	35,445	157,292	280,531	309,387
Transportation equipment	29,433	132,645	260,137	317,084
Instruments and related products	7,690	33,630	56,437	41,042
Miscellaneous manufactures	15,385	60,570	114,409	215,417

*Withheld because the estimate did not meet publication standards, either on the basis of the associated standard error of estimate or on the basis of a consistency review.
Source: U.S. Department of Commerce, 1954 Census of Manufactures, preliminary report.

Table III.—Mineral Production of Wisconsin

Mineral	1953		1954*	
	Quantity (In short tons)	Value	Quantity	Value
Total		\$55,212,000		\$54,286,000†
Clays	175,000	175,000	180,000	174,000
Iron ore	1,854,000	†	1,600,000	†
Lead	2,000	549,000	1,000	346,000
Lime	124,000	1,566,000	115,000	1,558,000
Sand and gravel	23,664,000	16,253,000	23,979,000	17,396,000
Stone	7,450,000	15,980,000	8,289,000	16,188,000
Zinc	17,000	3,871,000	16,000	3,355,000
Other minerals . . . . .	...	16,818,000	...	15,850,000

*Preliminary. †Total has been adjusted to eliminate duplication in the value of clays and stone. ‡Value included with other minerals.
Source: U.S. Bureau of Mines.

1955 as against \$74.79 in 1954. Wisconsin's second largest industry, the tourist business, brought more than \$15,000,000 into the state as thousands of tourists visited its 8,676 lakes. (C. L. L.)

Mineral Production.—Table III shows the tonnage and value of those mineral commodities produced in Wisconsin in 1953 and 1954 whose value exceeded \$100,000. In 1954, Wisconsin was seventh among the states in sand and gravel output and ranked 33rd in the value of its mineral output with 0.39% of the U.S. total.

ENCYCLOPÆDIA BRITANNICA FILMS.—*Middle States*, 2nd ed. (1955).

Woman's Christian Temperance Union, National: see SOCIETIES AND ASSOCIATIONS, U.S.

Women's Clubs, General Federation of: see SOCIETIES AND ASSOCIATIONS, U.S.

Women's Fashions. The year 1956 was characterized by what might be termed a "romantic revival" in women's fashions in the United States. Both in dress and in home decoration there was a shift away from stark simplicity to a more elaborate, intricate and individualized mood.

Although there were important changes in the silhouette, the most significant differences lay in greater formality; sweet feminine colourings, mingled with candy-box abandon; the stress on softly clinging or floating fabrics such as thin silk, satin and chiffon; and a strong return of delicate feminine froufrou: ribbons, roses, feathers, jabot frills and fur trimming.

Of major influence on U.S. designers was the Broadway play *My Fair Lady*, a musical version of George Bernard Shaw's *Pygmalion*, with décor and costumes of the late Edwardian era 1906-12 designed by Cecil Beaton. Beaton's visualization of the opulent, perfumed period just preceding World War I influenced women's fashions, men's wear, children's clothes, millinery, shoes, coiffures and cosmetics. The peaches-and-cream complexion and the upswept hairdo with a pompadour or chignon became the beauty ideal, balancing the stately effect of large hats, longer and narrower skirts and wrapped coats.

Counterpointing soft, patrician prettiness, was the chic of the alluring "lady spy" costume of slinky dead black, long-sleeved and low-necked dress with an alluring big plumed hat or jeweled turban.

In the realm of style "catchwords," designers retired two venerable and worn-out terms: "look" and "sheath." As Adele

Simpson explained it, "the fashion-minded woman replaced a 'look' with a presentation of her own good looks, counting her personality, her posture, grace and loveliness as vital means of self-expression in dress."

In the construction of clothes, there was a change from "cut" to "drape" as a basis of the silhouette. The taut Empire sheath and the boned bodice were banished in favour of softness of line achieved through long shallow drapery. The long-legged figure line was emphasized by a retention of the high waistline, kept "small" by wide sashes, under-bosom belts or drapery caught by bows or bouquets of roses. Full skirts remained in fashion, but lost their solid underpinnings of interfacing and petticoats in favour of deep pleats, side folds or multiple airy layers of sheer fabric.

The bloused back and low-backed bodice gave a new graceful "slouch" to the profile. Wrapped-and-tied effects were important in both construction and in trimming. Most coats stressed the luxurious effect of large collar, deep armholes and a deeply wrapped front.

The oriental splendour which pervaded 1955 fashion was heightened in 1956. Harem hemlines on satin and chiffon evening dresses, coloured jewel embroidery on opulent metal brocades, evening turbans of tulle, brocade and satin, exotic colour combinations such as emerald green and sapphire blue, flame with orange, and red and yellow were part of this oriental renaissance.

A trend toward capes, first noted in the U.S. collections of such designers as Norman Norell and Ben Zuckerman and later strongly sponsored by Parisian couturiers Balenciaga and Christian Dior, brought quick acceptance. Short capes, barrel capes and full length capes were shown in place of jackets for daytime and cocktails, and evening capes came into prominence. While the coat silhouette was amplified, the suit silhouette contracted with a much shorter, more fitted jacket coming into vogue.

The softening influence throughout fashion had its effect on daytime and sports clothes. Slender suit skirts had double tunic hemlines, wrap-around drapery or "Dutch boy" pegtop hielines (the latter introduced by Christian Dior) for ease and grace. The ultra-feminine overblouse of silk crepe, thin satin or silk chiffon was seen with daytime suits. The delicate blouse appeared in every phase of fashion from sport clothes to ball gowns. The "little boy" aspect in sports clothes changed to a girlishly decorative effect, which combined freedom and ease with great prettiness.

The year 1956 was a vintage year in fabrics. There were velvety-surfaced woollens, tweeds reduced to featherweight and woven in elegant small patterns, suitings of pure cashmere or vicuna and supple chiffon broadcloth. Afternoon and evening fabrics saw the return of charmeuse satin, silk georgette, flat crepe, double and triple chiffon, crepe mystère, shadow lace, metal thread lace, French lamé, gold tissue, point d'esprit and silk tulle, with oriental brocades, panne and Florentine velvets and Edwardian cut velvets. The return to favour of the silk crepe daytime dress and the revival of chiffon as an evening fabric were milestones of the year.

The "clinging" theme brought a new interest in knits, from ribbed cardigan bands and knit sleeves on wool dresses to fine-textured knit cocktail dresses. The bulky knit coat-sweater and knitted full-length coat became popular daytime and sports fashion.

Fur was a recurring note in fashion's new luxury mood. Mink collars appeared on tailored suits and street dresses and on evening costumes. Black or white fox and natural lynx made great "glamour girl" collars on tweed day clothes and evening clothes, the latter often with hems of fur. The sable-collared cloth coat or dinner suit struck an important note of elegance. American broadtail was handled like fabric to make daytime jackets, lined



Above: Chiffon dress for evening wear from the 1956 Dior collection

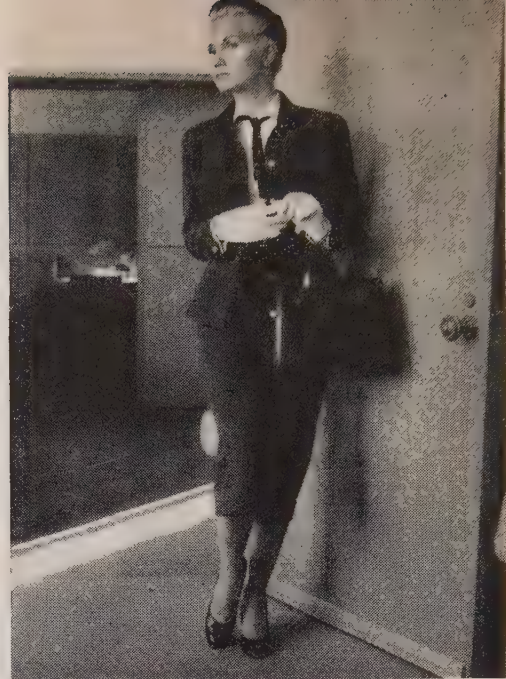
WOMEN'S FASHIONS

Top, right: Gray flannel suit designed by Edith Head of Hollywood (actress Eva Marie Saint shown modelling)

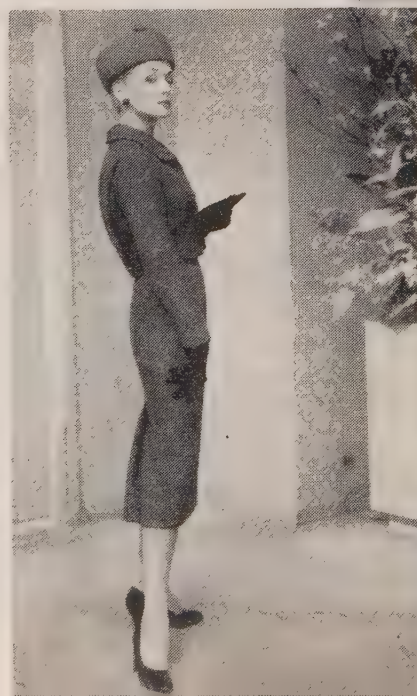
Right: Coffee-coloured silk satin and lace dress embroidered in gold thread. From the fall 1956 collection of Ceil Chapman

Below, left: Three-piece wool suit, featuring a wing-back bolero jacket, red blouse and swallow-tail skirt. Adele Simpson collection, 1956

Below, right: Silk satin sheath dress with mink-collared wrap. Adele Simpson



Above: The "vintage look" in hats, inspired by the 1912 costumes for the musical comedy *My Fair Lady*; a black net pillbox with ostrich feathers. Designed by Lilly Daché



with the material of the dress beneath. (See also SHOE INDUSTRY.) (Ae. S.)

Wood: see FORESTS; LUMBER.

Wool. World production totals for 1955 were substantially higher than had been anticipated, primarily because of revised figures for production in the Soviet Union and the satellite countries, as new data from these countries became available during 1956. Other countries with notable increases were the Union of South Africa, where production increased about 3% more than anticipated, and the United States, where a correction was made because of previous error in converting pulled production to greasy shorn basis. Latest estimates of world production for 1956 indicated a further increase of about 4% over 1955. The largest single wool producer, Australia, continued to show the greatest increase, with an 8% gain over 1955 production, while smaller gains were shown by New Zealand and South Africa. Argentina, Uruguay, the United States and the combined

October prices had levelled and appeared to have reached a trading plateau which was expected to hold for the balance of 1956. The United States, despite increased consumption and greatly reduced stocks, was unable to compete in world markets for purchase of wool, relying on its government-owned wools. The world price for apparel wool in September was about \$1.50 per clean pound as compared with \$1.40 per clean pound a year previously and \$1.60 per clean pound in 1954.

(See also LIVESTOCK; TEXTILE INDUSTRY.) (H. D. W.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Wool* (1947).

Words and Meanings, New. English adds many new words to its vocabulary every year, some destined to live long, others to die soon. The words listed below, pertaining largely to 1955–56, are but a small residue of those collected by the committee preparing this article.

Attention may be called to several groups of the coinages below. As usual, scientific and technological advances were well represented among the new words and meanings: witness “ACLS,” “aerocycle,” “bubble chamber,” “missilry,” “optical amplifier,” “pantobase,” “scatter transmission.” New terms such as “anti-missile missile,” “brinkmanship,” “destalinization,” “enosis,” “open sky,” “Poujadism,” and “redefection” reflected the international scene. The U.S. scene was represented by a number of interesting coinages in a variety of fields: for example, “Americade,” “archesum,” “automatic,” “bait switch,” “exurbanite,” “motelery,” “postdebutante,” “soil bank,” and “squirrel.”

The words listed below became prominent or were seemingly used for the first time during 1955 and 1956. Dates within the parentheses following a word or definition indicate the first recorded use of the new word or meaning in the files of the committee.

A hyphen preceding the date means that the word or meaning is suspected of being older than the date given. If no date is given, the first record on file is 1956.

- accommodation sale.** The sale of a commodity to another dealer for resale.
- ACLS, Automatic Carrier Landing System,** a device designed to bring an aeroplane down automatically. (1955)
- actual, n.** A motion picture, radio or television program based on a story of something that actually happened. (1955)
- aerocycle, n.** A small helicopter under test by the U.S. army for use by combat infantrymen. (1955)
- aerothermochemistry, n.** The study of the behaviour of burning fuels in gas streams moving at high speed. (1955)
- afterburner, n.** A device for burning gas that passes through to the exhaust pipe of an automobile.
- agribusiness, n.** The various enterprises concerned with farming as a business. (1955)
- air curtain.** A partition of air formed by blowers, which can serve as a door. (1955)
- Air Traffic Control Transponder.** A radar device for spotting and identifying aeroplanes. (1955)
- Americade, n.** An exhibition on wheels which shows the economic future of America. (1955)
- analog correlator.** A computing machine that works with brain waves. (1955)
- anti-missile missile.** A proposed weapon for intercepting guided missiles. (1955)
- anti-proton, n.** The recently discovered negative proton, whose existence long had been suspected. (1951)
- archesum, n.** Term coined by Solomon R. Guggenheim and Frank Lloyd Wright for “a building in which to see the highest.”
- automatic, n.** Football. A sudden change in signals after a line-up. (1955)
- awardee, v.t. Humorous.** To give (one) an award.
- bait switch. Commercial.** The attempt to sell a more expensive product than the one advertised. **bait ad.** (1954)
- barganza, n.** A bargain sale; a group of bargains.
- bounce block stutter.** The repetition of the initial syllable of a word to promote intelligibility (as in aeroplane communication). (1955)
- brainstorming, n.** The co-operative contributing of ideas on a special problem. **brainstorm, v. brainstorm, adj.** (1953)
- brain-washee, n.** One who has been brainwashed. (1955)
- BRANE, Bombing Radar Navigation Equipment,** an electronic device to direct an aeroplane to its target with great accuracy.
- brinkmanship, n.** (By analogy with **gamesmanship**). A policy in international affairs of allowing differences to go to the brink of war before they are resolved.
- brushpicker, n. Commercial.** One who searches in forests for the kind of greenery used by florists in wreaths, sprays and the like. (1955)
- bubble chamber.** A device for detecting and studying high-speed particles;

Estimated World Wool Production

(In greasy shorn pounds)		
Country	1956	1955
Australia	1,399,000,000	1,283,000,000
New Zealand	462,000,000	455,000,000
Argentina	363,000,000	364,000,000
Uruguay	200,000,000	198,000,000
South Africa	313,000,000	306,000,000
United States	302,000,000	304,000,000
Total	3,039,000,000	2,910,000,000
Others	1,761,000,000	1,701,000,000
Grand total	4,800,000,000	4,611,000,000*

*Revised.

Source: Computed by the New York Wool Exchange from data released by the U.S. Department of Commerce and the International Wool Secretariat.

minor producing countries showed very little change from 1955. Consumption of wool in the world continued to make steady gains throughout 1955 and the first half of 1956, tending to increase in the same proportion as production. The United States continued to lead the way during the first half of 1956 with an approximate 8% gain in consumption over the corresponding period of 1955, while France, the United Kingdom and Japan also showed considerable gains.

Prices in the dominion auctions maintained a firm trend from mid-Oct. 1955 to the closing sales in July 1956, and stability of wool prices was a significant feature of the season. The end of the season showed Merino prices approximately 20%–25% above the level of the opening sales, while crossbreds were slightly more than 4% higher. The steady level of prices plus improved consumption were factors in the excellent clearances of wool from all markets, despite various stoppages occasioned by labour disputes. Strengthened world prices along with increased consumption were helpful in reducing stocks of South American wools which had accumulated the previous year. By taking approximately the same total as a year before, the British Commonwealth remained the largest purchaser of dominion wools, while Japan increased its purchases by 60% and the U.S.S.R. more than doubled the amount taken during the previous season. The United States took 5% less from the dominion but increased purchases from South America.

The dominion auctions reopened in late August and early September approximately 5% above the June closing levels and continued to show considerable firmness through the first month of sales. This strengthening move appeared to have been brought about by several temporary factors contributing to the reduced stocks and increased consumption in several of the major consuming countries. The Suez canal crisis together with Australian floods and shearing disputes caused considerable concern over early availability of Australian wools, thus encouraging and crystallizing earlier buying activity in that market. By mid-

it uses a super-heated liquid instead of vapour, as does the cloud chamber. (1954)

- canyoneer, n.** One who runs western rivers in various types of small boats.
- canyoneering, n.**
- channelize, v.t. Specif.** To control traffic turns by curbs and dividers.
- channelization, n.** (1950)
- cinematogenic, adj.** Suitable for filming. (1955)
- combustology, n.** The study of combustion. (1955)
- cool, adj.** Not radioactive; not contaminated. (1955)
- coronarian, n.** One who has suffered a coronary thrombosis. (1955)
- cytoanalyzer, n.** An electronic device for detecting diseased cells. (1955)
- destalinization, n.** The systematic deflation of the reputation of Soviet marshal Joseph V. Stalin. **de-Stalinize, v.** (1952)
- discounter, n.** A discount house. (1954)
- enosis, n.** Union, specif., of Greece and Cyprus. (1954)
- ES, Enhancing Substance, a natural body chemical.**
- Euratom, n.** A projected European atomic pool.
- exurb, n.** Short for **exurbia** (which see).
- exurban, n.** An **exurbanite** (which see).
- exurbanite, n.** A person who, having abandoned living in a city, keeps his city ways in his new abode. (1955)
- exurbia, n.** A country or suburban area where most city ways are maintained.
- fishyback, n. as adj.** The moving of a trailer-truck by ship. (1954)
- frigate, n.** A ship for launching guided missiles. (1955)
- frontage road.** On a limited access highway, a turnout road usually for a filling station or restaurant.
- greylisted, adj.** Partly, not completely, blacklisted.
- ground cushion.** A buoyant cushion of air between an aeroplane and the ground which helps the aeroplane to rise. (1954)
- head shrinker. Slang.** A psychiatrist. (1953)
- heart-cast, n.** A "broadcast" record of heart action. (1955)
- heat barrier.** The barrier set up by the heat generated by air friction on aeroplane surfaces at very high speeds, as a result of which materials tend to break down and lose their strength. (1955) Also **thermal barrier.** (1953)
- hero sandwich.** A sandwich made with a whole loaf of bread. (1955)
- industrial park.** A commercial-industrial area, out of the centre of a city, well landscaped, having good parking space, and not clashing architecturally with neighbouring residential areas. Also **industrial district.** (1953)
- lay-off pay.** Guaranteed annual wage. (1955)
- majoritarian, adj.** Ruled by the beliefs of the majority. (1955)
- master speech. Politics.** A document outlining campaign arguments, prepared by the central agency of a party. (1954)
- microcopy, n.** A copy of a document in microscopic form: microcard, microfilm or microprint. (-1955)
- missilry, n.** Guided missiles considered collectively.
- mortgage warehousing.** The use of commercial bank credit on an interim basis by mortgage lenders.
- motelery, n.** A huge, luxurious hotel designed for leisurely modern living, with some of the advantages of motels.
- open sky, n. as adj.** Descriptive of a plan for mutual aeroplane inspection of the military installations of two or more countries. (1955)
- optical amplifier.** An electronic device for seeing in the dark, used by the U.S. air force. (1955)
- orphan virus.** An unidentified virus.
- overage, n.** The excess of cost over estimate or contract price. (1955)
- Palouse, n.** A breed of hog.
- pantobase, n.** An aeroplane capable of using either land or water as a base. (1955)
- parentectomy, n.** The separation of an ill child from his home environment. (1955)
- partial wall.** An incomplete wall (in height or width) between two "activity areas" in a house. (1955)
- peace of mind drugs.** Drugs for mental ills. (1955)
- Pentamic Army.** A U.S. army fighting force with five battle groups to a division.
- philanthropoid, n.** One who disburses the money of a foundation. (-1955)
- philanthropoidal, adj.** (1955) -ally, adv. (1955)
- phonic, adj.** Powered by light. (1955)
- postdebutante, n.** A young unmarried woman who has had her debut. (-1956)
- Poujadism, n.** In France, resistance to taxes. **Poujadist, n.**
- ramped stage.** A stage sloping up at the rear, to give better perspective.
- redefection, n.** The returning of exiles to their native country. (1955)
- roll on, roll off, n. & adj.** The system of shipping via water in which large loaded crates, trucks and railroad cars are rolled onto a ship at a port and rolled off at another.
- rollout, n.** The rolling of an aeroplane from a production line.
- SAGE, Semi-Automatic Ground Environment, an air defense system.** (1955)
- sateloid, n.** A vehicle combining the features of an aeroplane and a space ship. (1955)
- scatter transmission.** The transmitting of very short radio waves to distances beyond the range of normal reception by virtue of scattering from irregularities in the high atmosphere. (-1955)
- sew-off, n.** (By analogy with **play-off**) A final contest among home-seamstresses.
- snowcat, n.** A snow tractor. (1952)
- soil bank.** Acreage taken out of production and improved in one way or another under government subsidy. (1955)
- solifosis, n. (solitude + neurosis)** Science-fiction term for hallucinations. (1955)
- split-time, n.** A daylight-saving time using a half-hour rather than an hour advance.
- SQ, survival quotient, the factors that promote long life.** (1954)
- squalorologist, n.** A writer stressing unpleasant matters. (1955)
- squirrel, n.** An irresponsible hotrodder. (1954)
- steel band.** A band using instruments made from oil drums. (-1955)
- stereosonic, adj. Brit.** Descriptive of three-dimensional tape recording. (1955)
- storm tracker.** A device for gathering weather data.
- strap, n. Slang.** A bundle of hundred-dollar bills. (1955)
- taxmanship, n.** The strategy of avoiding taxes through legal means. (1955)

tear-away jersey. A football jersey that tears easily and cannot be used to keep a player from running when grasped by an opponent.

- tele-census, n.** Census of television owners' interests. (1955)
- thermal barrier, thermal thicket. See heat barrier.**
- traffic separator.** A strip between two directions of traffic. (1955)
- tranquillizer, n. Specif.** A drug designed to reduce tensions. (1953)
- voice-tap, n. as adj.** The electronic recording of talk. (1955) **voice-tapping, n.** (1955)
- VTOL, vertical take-off and landing aircraft.**
- wine-mobile, n.** An automobile that dispenses wines.
- wolf-whistle, v.t.** To whistle in a certain manner to indicate high approval of the physical attributes of a young woman. (1955) **n.** (1940)
- zigzag eating.** The shifting of the fork from one hand to the other in eating. (I. W. R.)

World Assembly for Moral Re-Armament.

"This Is The Future" was the theme of World Assemblies for Moral Re-Armament held at Mackinac Island, Mich., and Caux, Switz., in 1956. A world ideological mission of more than 300 persons travelled through Scandinavia, France, Germany, Switzerland, Italy, the Netherlands and Great Britain at the invitation of national leaders. Accompanying the mission was the musical play *The Vanishing Island*, which had played to 418,000 people, the leadership of 1,000,000,000 people, in 26 countries of Asia, Africa and Europe in 14 months since its launching from Washington, D.C., in June 1955.

In inviting the mission to west Germany, Chancellor Konrad Adenauer welcomed "an ideology which can bring clarity and a moral force to shape international relations." In Paris, Fr., the Catholic philosopher, Gabriel Marcel, wrote: "It is a hope; perhaps even *the* hope." The Sultan of Morocco urged that a Moral Re-Armament assembly be held in his country to bring to all North Africa the unity which had been initiated in Morocco. He said, "Moral Re-Armament brings an answer to all the problems that divide men and nations."

Frank N. D. Buchman, initiator of Moral Re-Armament, returned to the U.S. to open the Mackinac assembly at the invitation of 62 members of congress. The all-African play *Freedom* had its U.S. *première* at the Mackinac assembly. Written and produced by 27 Africans from all parts of that continent, it had been seen by 30,000 persons in eight capitals of Europe. The Mackinac assembly drew more than 1,500 delegates from 45 countries, including parliament members, diplomats and official government representatives from 15 nations of Asia, Africa, Europe, and North and South America.

The World assembly at Caux, which had drawn 90,000 persons from 121 nations since 1946, marked its 10th anniversary in July 1956. There, leaders from every continent gave evidence of the answers Moral Re-Armament brought to class, racial, industrial and international conflicts. (F. N. D. B.)

World Bank: see INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT.

World Council of Christian Education: see RELIGIOUS EDUCATION.

World Council of Churches: see CHRISTIAN UNITY; RELIGION; SOCIETIES AND ASSOCIATIONS, U.S.

World Health Organization.

The World Health organization (WHO) became a specialized agency of the United Nations on Sept. 1, 1948, when 26 countries had ratified its constitution, and by 1956 comprised 84 full member states and 4 associate members.

The work of WHO on communicable diseases reached a stage in 1956 at which it became possible to review the activities of the last several years with a sense of perspective and to look into the future with the hope that, by using similar methods of approach, results could be obtained in the fight against many communicable diseases as important as those achieved against malaria, the endemic treponematoses and smallpox. For these

infections there were available public health techniques of eradication.

In the case of most other communicable diseases, knowledge had not reached a point where eradication could be considered, but a beginning had been made toward their control. In recent years the most dramatic achievement in this field had been the development of a vaccine against poliomyelitis. It was clear that, for countries with a high incidence of the paralytic form of this disease, the vaccine presented an effective means of reducing the serious consequences of infection. Equally, it had been confirmed that BCG vaccination had a real effect in reducing the extent of tuberculosis, although it must be combined with a program of case finding and treatment to bring tuberculosis under control. In the fight against trachoma, it had been established that both the frequency and duration of treatment could be reduced and that, by suitable training for school teachers and others, mass treatment was a practical proposition. Equally, the discovery of sulphone drugs effective against leprosy had favourably changed the prospects for control of that disease.

During the first year after the eighth World Health assembly resolved to recommend malaria eradication, many governments accepted the policy and were attempting to reach this goal. The new policy was confirmed by the ninth World Health assembly (1956) and a number of meetings were organized in many parts of the world to implement it.

During the year, WHO personnel were engaged in malaria projects in 34 areas in all the WHO regions, except Europe, including new projects in Ethiopia and the Sudan.

Mass campaigns against endemic treponematoses (endemic syphilis and yaws) assisted by WHO and UNICEF had reached 55,000,000 people examined and 16,000,000 treated by the end of 1956, in a number of countries in the Americas, the eastern Mediterranean, southeast Asia, Africa and the western Pacific. Several new antiyaws projects were started during the year.

It was becoming clear that the elimination of syphilis and other venereal infections in the more developed countries could not be regarded as really accomplished if important reservoirs remained in other parts of the world. This situation called for the maintenance and close integration of a co-operative, international, long-range control program of venereal diseases and treponematoses, as resolved by the International Symposium on Venereal Diseases and Treponematoses at Washington, D.C., organized jointly by the U.S. public health service and WHO in May 1956 and attended by about 500 medical officers.

WHO was actively assisting member countries to develop public mental health services. In Jordan a psychiatric hospital was being reorganized on modern lines with the assistance of a WHO psychiatric consultant. In Thailand a WHO expert had inaugurated training programs in the field of child psychiatry and assisted the government in improving its mental health services. WHO was assisting the All-India Institute of Mental Health in extending training programs.

A tremendous expansion took place during 1956 in maternal and child health work, often with assistance from UNICEF, with the object of including health programs for mothers and children within the broader scope of general health services. Latin America was leading in this field. In India a wide range of maternal and child health activities, including training, had been incorporated in nine state public health programs, with two additional ones in the planning stage. These programs were expected to reach 260,000,000 people, equal to more than 70% of the total population of India. Forty-six WHO personnel were participating in this work.

Technical discussions at the 9th World Health assembly were concerned with nurses, their education and their role in health programs. Delegations of 21 member states to the assembly in-

cluded nursing experts. It was the first occasion on which doctors, health administrators and nurses jointly considered problems of nursing on an international basis. Assistance to governments in the training of nurses and midwives was expanded and during 1956 there were 191 WHO nurses thus occupied in 43 countries. A consultant on psychiatric nursing was made available to five countries. Three regional nursing conferences were held during the year.

A dental health officer was also appointed during the year.

Increasing attention was being paid by WHO to the health problems raised by the use of atomic energy. WHO's program in the field of atomic energy was established under the following principal heads: (1) training of specialists for protection work in atomic energy laboratories or plants, of public health administrators in the disposal of radioactive wastes and the siting of reactors and of medical personnel in the uses of radioisotopes; (2) establishing an interchange of information service on medical problems of atomic energy and medical use of isotopes; (3) determining the extent of health problems raised by building reactors and the disposal of radioactive wastes from factories, laboratories and hospitals; (4) standardization of radiation units and radioisotopes for medical use; and (5) stimulation and co-ordination of research on health aspects of radiation, including its genetic effects.

By the end of 1956 the number of fellowships awarded by WHO, mostly for postgraduate or other specialist training in medical and allied subjects, had reached 6,000 since its inception in 1947. Visiting professors, teaching special subjects, spent 335 months during 1956 in 17 different countries under WHO's auspices.

The ninth World Health assembly met in Geneva, Switz., during May 1956 and adopted an effective working budget of \$10,700,000 for 1957. While the expected contribution to WHO's work from the UN expanded program of technical assistance fell somewhat short of the anticipated amount of \$5,000,000, the assembly was informed that the financial position of WHO was better than ever before so far as payment of contributions due under the regular budget was concerned. Full membership in the organization was accorded by the assembly to three newly independent states, Morocco, Sudan and Tunisia, which had previously been associate members. In addition, three new associate members were admitted: Gold Coast, Nigeria and Sierra Leone.

Because the quarantine station at Jedda (Saudi Arabia), created with WHO assistance, was now equipped to handle pilgrim traffic satisfactorily, the special regulations for sanitary control of the traffic were unanimously abolished by the assembly.

The tenth World Health assembly was to be held in Geneva during May 1957.

(See also CHILD WELFARE.)

(M. S. W.)

Wrestling. Dan Hodge of the Sooner Athletic club of Oklahoma and Bill Kerslake of the Case club of Cleveland, O., starred in the 1956 Amateur Athletic union's na-

Free-Style Champions

114.5 lb.—Richard Delgado, San Diego, Calif.
125.5 lb.—Bill Carter, Tulsa Y.M.C.A.
136.5 lb.—Allan Rice, New York A.C.
147.5 lb.—Tommy Evans, Tulsa Y.M.C.A.
160.5 lb.—Bill Fisher, Sooner A.C.
174 lb.—Dan Hodge, Sooner A.C.
191 lb.—Pete Blair, Navy.
Heavyweight—Bill Kerslake, Case A.C.
Team—Sooner A.C.

Graeco-Roman Champions

114.5 lb.—Ray Osborne, San Francisco (Calif.) Olympic club.
125.5 lb.—Jack Blubaugh, Tulsa Y.M.C.A.
136.5 lb.—Allan Rice, New York A.C.
147.5 lb.—Jerry Maurey, Sooner A.C.
160.5 lb.—Khalil Toha, Ford Wrestling club.
174 lb.—Dan Hodge, Sooner A.C.
191 lb.—Ken Maidlow, Michigan State (E. Lansing, Mich.)
Heavyweight—Bill Kerslake, Case A.C.
Team—Tulsa Y.M.C.A.

tional championships held in March at Tulsa, Okla. Hodge, the Oklahoma university (Norman, Okla.) grappler, won 174-lb. titles in both the free-style and Graeco-Roman divisions of wrestling and was chosen to receive the trophy as the outstanding wrestler of the tournament. Kerslake retained heavyweight laurels in both styles of wrestling in addition to winning trophies for the quickest fall and for being the top matman in the Graeco-Roman division. Allan Rice of the New York Athletic club was the only other double winner of the tourney. He triumphed in the 136.5-lb. groups in both divisions.

Olympic Trials.—A record field of 283 competed in national Olympic tryouts at the Hollywood Legion stadium at Los Angeles, Calif., April 29–May 5. Kerslake, Hodge and Rice again were among the leading winners. Kerslake captured the heavyweight berth at free-style and was alternate to Ralph Bartleman of Fort Carson, Colo., in Graeco-Roman. Hodge was the top 174-pounder and Rice the 136.5-lb. leader in the Graeco-Roman group. Bill Smith, New York A.C. 1952 Olympic champion at 160.5 lb., returned to competition and won in the 174-lb. free-style division. Smith was chosen U.S. team captain.

College Wrestling.—Oklahoma A. and M. college (Stillwater, Okla.) won its third consecutive National Collegiate Athletic association team championship at Stillwater in March. Pittsburgh (Pa.) won its third straight title in the Eastern Inter-collegiate Wrestling association while Michigan (Ann Arbor) carried off team honours in the Western (Big Ten) conference. N.C.A.A. victors follow:

115 lb.—Terry McCann, Iowa.
123 lb.—Ed Peery, Pittsburgh.
130 lb.—Myron Roderick, Oklahoma A. and M.
137 lb.—Jim Sinadinos, Michigan State.
147 lb.—Ed Eichelberger, Lehigh.
157 lb.—Larry Tempas, Illinois.
167 lb.—Ed DeWitt, Pittsburgh.
177 lb.—Dan Hodge, Oklahoma.
191 lb.—Ken Lever, Iowa.
Heavyweight—Gordon Roesler, Oklahoma.
Team—Oklahoma A. and M.

(See also OLYMPIC GAMES.)

(T. V. H.)

Wyoming.

A Rocky mountain state of the United States, 1890, as the 44th state. The name of the state, which means "the end of the plains," was derived from the Delaware Indian language and the Wyoming valley in Pennsylvania. The motto of Wyoming, "Equality state," came from the fact that the state played an important part in the development of woman suffrage in the United States. Wyoming is also known as the "Cowboy state" and the "Sagebrush state." Wyoming ranks 8th in size and 47th in population among the states. The land area is 97,506 sq.mi.; water area, 408 sq.mi. The 1950 census, which gave a total population of 290,529, listed rural inhabitants at 145,911, or 50.2% of the population of the state, and urban at 144,618, or 49.8%. Of the total inhabitants, 270,719 were listed as native white, 2,557 as Negro, 13,290 as foreign-born and 3,963 as non-white. The July 1, 1956, population estimate was 312,000 of which 301,000 was civilian population. The capital is Cheyenne, with a population (1956 estimate) of 35,040. Other cities in Wyoming with populations of 10,000 or more, according to the 1956 estimate, were: Casper, 32,200; Laramie, 15,581; Sheridan, 11,700; and Rock Springs, 11,400.

History.—In the federal legislature, the state of Wyoming was represented in 1956 by a Democratic senator, Joseph C. O'Mahoney, and a Republican senator, Frank A. Barrett. E. Keith Thomson, a Republican representative, was re-elected in the Nov. 1956 election to represent the state in the federal house of representatives. Elected in 1954 to state offices for the term 1955–59 were Milward L. Simpson, governor; Everett T. Copenhaver, secretary of state; Minnie A. Mitchell, auditor; Charles B. Morgan, treasurer; and Velma Linford, state superintendent of

public instruction. The Nov. 1956 elections saw the Republicans lose to the Democrats three seats in the state senate and two seats in the state house of representatives. The state senate was to be composed of 16 Republicans and 11 Democrats, and the state house of 30 Republicans and 26 Democrats, for the period 1956–57.

In the presidential contest, the Republican ticket of Dwight D. Eisenhower and Richard M. Nixon received 60.1% of the votes, as compared with 39.9% to the Democratic candidates, Adlai E. Stevenson and Estes Kefauver. The count was about 74,500 to 49,500 votes.

Education.—In 1955–56 there were 543 elementary and rural schools in Wyoming, with 1,678 elementary teachers and 385 rural teachers and a total enrolment of 53,823. There were 85 accredited high schools with 1,078 teachers and an enrolment of 16,188. State operating expenditures for education in 1955–56 were approximately \$21,850,219. A total of 150 school administrators were employed in the state during this period.

Social Insurance and Assistance, Public Welfare and Related Programs.—Funds spent on public welfare for the period Oct. 1, 1955, to Sept. 30, 1956, were as follows: old-age assistance, \$2,756,346; aid to dependent children, \$779,822; aid to the blind, \$50,742; general welfare, \$347,722; aid to the permanently and totally disabled, \$341,865; and general welfare health, \$476,932. Unemployment insurance payments amounted to \$1,816,176, state unemployment insurance fund; unemployment compensation, veterans, \$80,825; and unemployment compensation, federal employees, \$90,911, making a total of \$1,987,912 for the fiscal year ended June 30, 1956.

Correctional institutions had 377 inmates and operating budgets (for the period July 1, 1955, to June 30, 1957) as follows: state penitentiary at Rawlins, 266 inmates, budget \$515,500, capital outlay \$25,000; penitentiary farm at Riverton, budget \$97,914, capital outlay \$25,000; girls' school at Sheridan, 51 inmates, budget \$225,800, capital outlay \$5,200; industrial institute at Worland, 60 inmates, budget \$249,337, capital outlay, \$104,600.

A home and hospital for the aged, known as the Pioneer Home at Thermopolis, the only state-owned and state-operated home of this type in the United States, was granted a budget of \$239,337, capital outlay \$218,500.

Communications.—During the period July 1, 1955, to June 30, 1956, the Wyoming highway department let approximately 239 contracts amounting to 1,409 mi. for an expenditure of \$31,264,004, of which 74 contracts amounting to \$3,687,325 for a total of 575.1 mi. were for state-county co-operative projects. The highway system in Wyoming consisted of 4,934 mi., of which 1,650.4 mi. were secondary routes. The maintenance budget for the period July 1, 1956, to June 30, 1957, was set at \$3,300,000. There were seven railroads in the state in 1955 with main track mileage (within the state) of 2,385.56. There were 42 commercial and municipal airports and airfields in the state in 1956, of which 2 were used jointly by the military, and 100 private strips. There were 100,000 telephones.

Banking and Finance.—On June 30, 1956, there were 28 state banks with deposits of \$84,080,108 and resources of \$93,654,948. There were 25 na-

Table I.—Principal Crops of Wyoming

Crop	Indicated 1956	1955	Average 1945–54
Corn, bu.	1,408,000	1,740,000	1,009,000
Wheat, bu.	5,101,000	5,200,000	6,089,000
Oats, bu.	3,100,000	3,451,000	4,305,000
Barley, bu.	2,700,000	3,080,000	3,940,000
Hay, tons	1,400,000	1,412,000	1,224,000
Beans, dry (clean), 100-lb bags.	780,000	589,000	948,000
Sugar beets, tons.	477,000	421,000	428,000
Potatoes, cwt.	993,000	875,000	846,000

Source: U.S. and Wyoming Departments of Agriculture.

Table II.—Number and Value of Livestock in Wyoming

	Jan. 1, 1956		Jan. 1, 1955	
	No. on farms	Value	No. on farms	Value
Cattle and calves.	1,118,000	\$93,912,000	1,096,000	\$101,928,000
Hogs and pigs	32,000	541,000	34,000	904,000
Stock sheep and lambs	1,998,000	32,368,000	1,903,000	32,732,000
Horses and mules	58,000	3,016,000	58,000	2,436,000
Chickens	468,000	562,000	508,000	610,000
Turkeys.	7,000	34,000	6,000	31,000

Source: U.S. and Wyoming Departments of Agriculture.

Table III.—Mineral Production of Wyoming

(Short tons, except as noted)					
Mineral	1953		1954†		
	Quantity	Value	Quantity	Value	
Total		\$255,906,000		\$281,306,000†	
Clays	853,000	10,037,000	944,000	9,534,000	
Coal	5,245,000	23,744,000	2,831,000	11,541,000	
Iron ore	733,000	*	513,000	*	
Natural gas (000 cu. ft.)	76,262,000	6,025,000	71,068,000	5,970,000	
Natural gasoline (000 gal.)	?	*	47,000	3,137,000	
Petroleum (bbl.)	82,618,000	195,800,000	93,533,000	229,160,000	
Petroleum gases (000 gal.)	?	*	46,000	2,128,000	
Sand and gravel	3,149,000	2,001,000	4,164,000	2,682,000	
Stone	1,431,000	1,840,000	1,616,000	1,665,000	
Other minerals . . . . .	...	16,459,000	...	15,850,000	

*Value included with other minerals.

†Preliminary.

†Total has been adjusted to eliminate duplication in the value of clays and stone.

Source: U.S. Bureau of Mines.

tional banks with deposits of \$228,692,121 and resources of \$247,213,154. On Nov. 30, 1956, there were ten savings and loan companies with resources of \$46,500,000. Total state receipts for the period of July 1, 1955, to June 30, 1956, were \$71,982,868. Total disbursements for the same period were \$65,299,397. As of June 30, 1956, the state was obligated for \$3,869,000 worth of revenue bonds (not guaranteed). The state had no general obligation bonds.

Agriculture.—Cash receipts from marketings of crops and livestock and livestock products in 1955 amounted to \$114,796,000. Livestock and livestock products accounted for 77.1% of this total. Cash receipts the first seven months of 1956 were slightly less than those during the same period in 1955.

Drought was again a serious problem in southern and central Wyoming during 1956. Range feed in these areas was in short supply and crop production was below average. Feed supplies for wintering livestock were short, and a large area in southern and central Wyoming was declared a disaster area.

Manufacturing.—According to the 1954 survey of manufactures made by the U.S. bureau of the census, the preliminary report of which was released in 1956, there were in Wyoming in 1954 a total of 329 manufacturing establishments, employing 6,100 workers who received \$26,000,000 in wages during the year. The value added by manufacture was \$50,400,000. The major industry groups were food and kindred products, lumber and wood products, printing and publishing, petroleum and coal products and stone, clay and glass products.

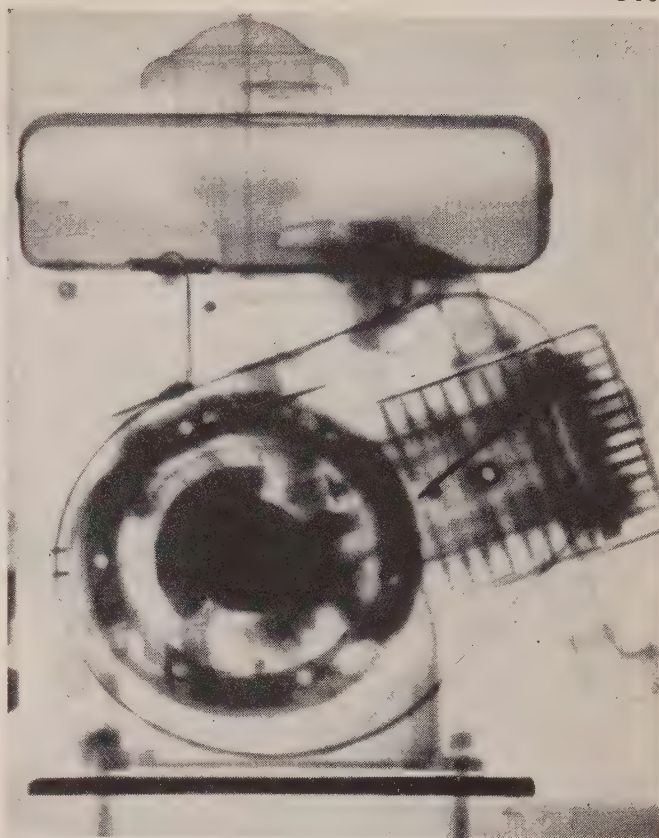
Mineral Production.—Table III shows the tonnage and value of those mineral commodities produced in Wyoming in 1953 and 1954 whose value exceeded \$100,000. In 1954 Wyoming was first among the states in bentonite, with 58% of the U.S. output; third in pumice; and fifth in crude petroleum and phosphate rock. Wyoming ranked 13th in value of its mineral output, with 2.02% of the U.S. total.

ENCYCLOPÆDIA BRITANNICA FILMS.—*Northwestern States*, 2nd ed. (1956); *Wyoming* (1955).

X-Ray and Radiology. L. Lusted and E. Miller described in Aug. 1956 an electronic spot film timer in which the fluoroscopic table top and the fluoroscopic screen mounting were used as calipers to measure the patient's thickness and thus obtained an optimum spot film exposure time. A simple electronic timer and rack were attached to the nonmovable fluoroscopic screen tower. A potentiometer and pinion gear were mounted on the movable fluoroscopic screen support. A gear whose circumference was equal to a distance of travel between 19 and 30 cm. was chosen so that in one rotation of the gear the spot film exposure time varied from 0.1 to 2.0 seconds. The authors believed that the spot film background density thus obtained was more constant than that obtained with phototiming or conventional time exposure techniques. In their hospital, prior to the use of this electronic timer, a large percentage of the spot films were discarded as unsatisfactory as a result of improper exposure. After installation no films were discarded for this reason.

The determination of the individual dosage of the radioactive isotope I^{131} , used in the treatment of hyperthyroidism, depends on a clinical estimate of the weight of the thyroid gland. This had led, in a number of cases, to subtherapeutic effects and, in others, to overdosage. V. Franco and M. Quina presented a new method for determining the volume and mass of the thyroid gland by radiographic methods. Oxygen was insufflated by skin puncture of the infrahyoid region of the neck and after the needle had passed through the fascial planes. Approximately 150 c.c. of oxygen were used. This outlined the thyroid gland on radiographs of the neck taken in the anteroposterior and lateral projections. Using a geometric method, the authors determined the weight of the thyroid gland and in no case was the error greater than 10%. No complications were observed in treating 60 patients with the use of pneumothroid. This procedure was not used in patients with evident signs of cardiac insufficiency.

N. Leone *et al.* reported the X-ray findings and bone changes in 237 persons, approximately one-half (116) of whom resided in a high fluoride area (8 parts fluoride per 1,000,000 parts water), and the other half (121) of whom resided in a low fluoride area (0.4 parts fluoride per 1,000,000 parts water). X-rays of the thoracic, lumbosacral spine and pelvis, to include the upper third of each femur, were made of each participant in 1943. Similar studies were again made in 1953. The authors concluded that excessive fluorides in a water supply (8 parts



X-RAY OF A GASOLINE ENGINE, believed to be the first ever made of machined equipment, accomplished by a stroboscopy process developed by General Electric company in 1956. Using radiation pulses of a 5,000,000 to 15,000,000-volt betatron, engineers were able to obtain slow-motion and stop-motion photographs of the two-horsepower, four-cycle engine in action

per 1,000,000), may have produced roentgenographic evidence of bone change; however, these changes only occurred in a select few (approximately 10% to 15%) and were then slight, difficult to recognize and in most instances were equivocal in degree. These changes were not associated with other physical findings, except for dental mottling in those persons who had resided in the high fluoride area during the tooth-formation period (up to 8 years of age). Also, these changes could not be ascribed to excessive fluorides alone.

R. Fishman and L. Citrin developed a new technique for implantation of radium needles which not only avoided excessive exposures but also allowed for more accurate placement. They used a plastic sheath with dummy needles made of stainless steel Kirschner wire of the same length and diameter as the radium needles. These were inserted into the lesion and then their location was carefully checked by X-ray films. After corrections were made and the dummy implant considered satisfactory, the radium needles were brought into the room and each dummy needle was rapidly replaced by its corresponding radium needle, leaving the plastic sheath in place.

Radiation therapy for peptic ulcer had been used at The University of Chicago since 1937. The rationale was that a depression of the acid secretions by the stomach would facilitate healing of the ulcer. This had been used in addition to the routine medical program of hospitalization, diet, milk, cream and antacids. Two groups of patients were observed and followed—one large group who had stomach ulcers and the other large group who had duodenal ulcers. Both groups, prior to radiation therapy, had one or more recurrences of ulcer symptoms. Following radiation therapy, the results showed that in the gastric ulcer group 53% had no recurrences and in the duodenal ulcer group 66% had no recurrences. In 79% of the patients there was an immediate reduction of the acid secretion by 50% or more. In no instance

did an ulcer fail to heal where there was an acidity for three months or longer. The authors concluded that radiation therapy to the stomach was a safe and useful adjunct to the medical management of peptic ulcer.

Recurrent cancer of the cervix was a concern of many physicians. Once a patient with cervical cancer had received an initial intensive course of radium and X-ray therapy, it had been thought that further radiation was contraindicated because of the disastrous complications. W. Murphy and A. Schmitz reported a series of 46 patients who had been reirradiated between the years 1946 to 1950 for recurrent carcinoma of the cervix. Some had been treated with external irradiation only, some with radium and the remainder with a combination of radium and external irradiation. They found that of the 46 patients, 9 were alive and without evidence of cancer more than six years following retreatment. They felt that retreatment was an indicated and hopeful procedure, particularly where recurrent pelvic involvement was limited. The complications, which were calculated risks, were minimized by prompt and adequate medical and nursing care. All the surviving patients, at the time of the report, were active and relatively comfortable. One patient had chronic proctitis, one had chronic cystitis, one had chronic cystitis and proctitis and two patients had rectovaginal fistula.

(See also TUBERCULOSIS.)

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Yachting. Carleton Mitchell's 38 ft. 7½ in. centreboard yawl "Finisterre" from Annapolis, Md., made a remarkable ocean racing record during 1956. Starting in Florida waters early in the year, "Finisterre" won first places in the St. Petersburg-Havana, Lipton cup and Nassau cup races; finished second to Luis H. Vidana's big Cuban yawl "Criollo," in the Miami-Nassau race; and fourth in the Ft. Lauderdale-Bimini race, which was won by "Comanche," John W. Price, of Miami.

Coming north, "Finisterre," one of the smallest of the record fleet of 89 starters in the race from Newport, R.I., to Bermuda—top event of the year in ocean racing—won the over-all Bermuda trophy as well as the Class D prize.

Other class winners in the Bermuda race were DeCoursey Fales' 28-year-old schooner "Niña" in Class A and two new centreboard yawls, Richard S. Nye's "Carina" in Class B and William T. Snaith's "Figaro" in Class C. A new record for the 635-mi. Bermuda course was made by the first boat to finish, the 73-ft. yawl "Bolero," sailing under the Swedish colours of Sven Salen. Her time was 70 hr. 11 min. 37 sec. bettering by 1 hr. 24 min. 6 sec. the mark set by "Highland Light" in 1932.

Big fleets were the order of the season in distance races, topped by 198 sail in the Newport Harbor, Calif., to Acapulco, Mex., race in May 1956. Winners were "Cynjo," Gordon Alles, in the heavy displacement division; "Altamar," Rux Smith, light displacement; "Jinker," Clark Sweet, arbitrary handicap; and "Sirius," Howard Ahmanson, first to finish.

Other major distance races off the west coast were the 1,430-mi., 24-boat race from San Diego, Calif., to Acapulco, Mex., won by the 37-ft. "Eventide," Stephen M. Newmark, of Los Angeles, Calif.; the 3,671-mi. race from Los Angeles to Tahiti, won by "Jada," William Sturgess of Los Angeles, among five

starters; and in the northwest the Swiftsure Lightship race won by "Adios," Carl Jensen of Seattle, Wash., and the Tri-Island series in Seattle waters, won by "Rebel," Douglas Sherwood.

Among many ocean races on the east coast were the Storm Trysail club's Block Island race, won by the 40-ft. yawl "Golliwogg," Colin E. Ratsey; the Stamford-Vineyard race, won by Walter H. Wheeler, Jr.'s 30-year-old, 71-ft. British-built yawl "Cotton Blossom IV"; and the Portland (Me.)-Monhegan race won for the fifth time by Edmund S. Kelley in the sloop "Departure."

Three yachts from the U.S. were among 26 starters in the Buenos Aires-Rio de Janeiro 1,200-mi. South Atlantic race, but none placed well and the Argentine Naval academy's big yawl "Fortuna" was the winner.

The Great Lakes'-Mackinac races drew good fleets, that from Port Huron, Mich., being won by the sloop "Gypsy," Joseph Schoendorf, Jr., of Milwaukee, Wis., and that from Chicago, Ill., by Nick Geib's yawl "Fleetwood."

An outstanding deep-sea event was the Tall Ships race from Torquay, Eng., to Lisbon, Port., which brought out a fleet of big square-rigged and fore-and-aft sail training vessels of various nations. However, the winner was a smaller craft, a 90-ft. British ketch, "Moyana," which was lost in a Channel gale on the way home from Lisbon.

An outstanding east coast yacht which stood out in the annual cruises of the New York and Eastern Yacht clubs was Bradley P. Noyes' centreboard yawl "Tioga." She took the Eastern's historic Puritan cup and on the New York cruise was a winner in several port-to-port races and took the Astor and Una cups. "Niña" won the Queens cup.

Individual sailing championships, conducted under North American Yacht Racing union auspices, were well distributed geographically. Mrs. Glenn H. Lattimore's Ft. Worth, Tex., crew took the Mrs. C. F. Adams (women's title) trophy away from the northeast coastal area for the first time. Ted Hood's Marblehead crew captured the Mallory (men's) trophy from Seattle, Wash., but a Seattle Corinthian Yacht club crew steered by Alan Holt took the Sears (junior) cup back to Seattle to replace it.

U.S. intercollegiate sailing competition reached a climax in the spring regatta in which a team from the Pacific coast I-C.Y.R.A. won the Lipton team race trophy and the Naval academy crews broke a 14-year reign of New England colleges in taking the Morss trophy, emblematic of national college sailing championship.

The supremacy of Canada in the North American affairs of the international six-meter class was demonstrated on Long Island sound when "Buzzy III," a new boat from Toronto sailed by William Gooderham, won the North American championship series; then led a three-boat Royal Canadian Yacht club team that beat the U.S. in a team series. Following that, Gooderham switched to the helm of "Titia," another Toronto boat, and took the 61-year-old Seawanbaka cup back to Canada for the first time since 1905.

The class that it was believed might supplant the sixes in international racing, the smaller and less costly 5.5-meters, of which Prince Olaf's "Norna VIII" won the Scandinavian Gold cup competition in European waters, was active in America. Its outstanding boat was the Swedish-built "Rush IV," owned by Victor F. Sheronas of Philadelphia, Pa., and steered in most of her races by Ensign Andy Schoettle, U.S. navy. She dominated class competition from its opening series in Bermuda in April through the U.S. Olympic trials in August, although one of the new American-built boats, the Hunt-designed "Quixotic," out-sailed her at times.

National and international competition in leading one-design classes produced the following champion skippers in 1956: Star

class—world champion, Capt. Agostino Straulino of the Italian navy (first three-time world champion of Stars); North American champion, Howard Lippincott of New Jersey. Lightning class—William S. Cox, Darien, Conn., international; Julio Cesar Goldie, Uruguay, Pan-American. Comet class—Wayne Diller, of Stone Harbor, N.J. Snipe class (U.S.)—Clark King, of Los Angeles. 110 class—Malcolm MacNaught, Hingham, Mass. 210 class—F. Gregg Bemis, Cohasset, Mass. Thistle class—Gordon Douglass, Mentor Harbor, O. Raven class—Robert Polhemus, Noroton, Conn. L-16 class—G. Shelby Friedrichs, New Orleans, La. Highlander class—Ray McLeod, Mentor Harbor. Y Flyer class—William Perry, Atlanta, Ga. (international); Hugh Carmichael, Deep River, Que. (Canadian). Flatties—John L. Williams, Portland, Ore.

Yellow Fever: see TROPICAL DISEASES.

Yemen. An Arab kingdom in the southwestern coastal region of the Arabian peninsula, Yemen lies between Saudi Arabia (northwest and northeast), Aden (southeast) and the Red sea (southwest). Area: 75,290 sq.mi. Pop. (1953 est.) 4,500,000. Language: Arabic. Religion: Moslem. Chief towns (pop., est.): Sana (cap.) 50,000; Taiz (seat of Imam) 12,000; Hodeida (port) 30,000. Imam (king): Ahmed ibn Yehya Hamid ed-Din; prime minister in 1956, Crown Prince Seif ul-Islam el-Badr.

History.—The renewal of Yemen's treaty of friendship with the U.S.S.R. in Nov. 1955 was followed in 1956 by the ostentatious development of relations between the two countries. Soviet and Czechoslovak trade missions visited Yemen, and the crown prince of Yemen visited Moscow—the first visit to be paid to the Soviet capital by any Arab leader. Diplomatic representation was established between the U.S.S.R. and Yemen and a trade agreement was concluded, by the terms of which the U.S.S.R. undertook to supply Yemen with agricultural machinery, oil products, wheat and rice, and to finance certain economic projects in Yemen. In return Yemen agreed to supply the U.S.S.R. with various agricultural products and was said to have agreed to keep out of middle east defensive alliances. However, on April 21 such a pact was signed with Egypt and Saudi Arabia.

While the rapprochement with the U.S.S.R. was going on, relations between Yemen and Great Britain were deteriorating. In addition to differences over the Aden protectorate, a dispute arose concerning the island of Kamaran in the Red sea, which had been under British control since 1915 and had been formally administered by the governor of Aden since 1949. When the British government granted an oil concession in the island to a British company Yemen protested on the grounds that Kamaran was Yemeni territory. Great Britain rejected the protest.

(E. S. AH.)

Agriculture.—Main crops: coffee (metric tons, 1954) 4,200, (1953) 4,800; wheat, barley and millet.

Finance.—Monetary unit, Maria Theresa dollar, called the riyal, nominally equal to 1 Indian rupee with an exchange rate of 4.76 riyals to the U.S.\$1.

Foreign Trade.—Trade with the U.K. (1954; 1955 in parentheses): imports £4,000 (£8,000).

Yiddish Literature: see JEWISH LITERATURE.



START OF THE RACE from Torquay, Eng., to Lisbon, Port., July 7, 1956

Young Men's Christian Association: see SOCIETIES AND ASSOCIATIONS, U.S.

Young Women's Christian Association: see SOCIETIES AND ASSOCIATIONS, U.S.

Yugoslavia. A federal people's republic of southeastern Europe, Yugoslavia is bounded north by Austria, north and northeast by Hungary and Rumania, east by Bulgaria, south by Greece and west by Albania, the Adriatic sea and Italy. Area: 98,766 sq.mi. Pop.: (1953 census) 16,989,164; (1956 est.) 17,853,000.

Federal republics	Population (1953 census)	Capital	Population (1953 census)
Serbia*	6,983,544	Belgrade	469,988
Croatia	3,936,642	Zagreb	350,452
Slovenia	1,501,961	Ljubljana	138,211
Bosnia-Herzegovina	2,843,486	Sarajevo	135,657
Macedonia	1,303,906	Skopje	121,551
Montenegro (Crnagora)	419,625	Titograd	16,333

*Including the autonomous province of Vojvodina (1,713,905) and the autonomous region of Kosovo-Metohija (809,234).

Other towns (pop. 1953 census): Subotica 115,402; Novi Sad 83,223; Maribor 77,124; Split 75,377; Rijeka 75,112; Nis 60,677; Osijek 57,320. Nationalities (1953 census): Serb 41.7%, Croat 23.5%, Slovene 8.8%, Macedonian 5.3%, Montenegrin 2.8%, undefined (Bosnian, Istrian, etc.) 5.9%, other (national minorities) 12%. Religion (1948 est.): Greek Orthodox 49.53%, Roman Catholic 36.7%, other Christian 1.14%, Moslem 12.52%, other 0.11%; at the 1953 census 13.6% replied "no religion." President of the republic, chairman of the federal executive council (government) and supreme commander of the armed forces in 1956, Marshal Tito (Josip Broz) (q.v.).

History.—The most important problem of the year 1956 was that of Yugoslavia's relations with the Soviet Union. In 1955 Tito had accepted the overtures of the Soviet leaders in their capacity as representatives of the Soviet state, but had declined to establish special relations between his party and the Communist party of the Soviet Union. His first departure from this principle was at the time of the 20th congress of the C.P.S.U., in Feb. 1956, when he sent a letter of greetings to the party. A further step came with Tito's official visit to the Soviet Union from June 2 to 23. At the end of the visit two statements were issued. The first was a general declaration on the friendly relations between the two governments. The second was an agreement between the two parties. The two most interesting passages stated that it was "indispensable that the existing contacts between the two parties should develop with a view to co-operation in the

international workers' movement"; and that "holding the view that roads to and conditions of socialist development are different in different countries . . . [they] agreed that co-operation should be based on complete freedom of will and equality."

Relations did not however develop entirely satisfactorily. It is true that the resignation of V. M. Molotov from the Soviet foreign ministry was a welcome gesture to Tito, as was the resignation on July 18 of Matyas Rakosi in Hungary. But during the autumn it transpired that a letter had been circulated from Moscow among the eastern European Communist parties warning them against Tito's example. Ill feeling caused in Belgrade by knowledge of this letter, and possibly also disagreements at the highest political level in Moscow, probably explain the sudden visit of N. S. Khrushchev to Yugoslavia on Sept. 19, and Tito's flight back with him to the Crimea on Sept. 27. At Yalta Tito met also Erno Gero, Rakosi's successor as first secretary of the Hungarian Communist party. Tito was back in Belgrade on Oct. 5, and *Borba* announced on the 12th that the matter of the circular letter "has now been settled." A week later Gero visited Belgrade, and returned to Budapest just before the outbreak of the revolution.

The Yugoslav leaders at first welcomed the Hungarian revolution. They had for some time regarded Imre Nagy with favour. Its later development alarmed them, however, both because it showed that Communist dictatorships can be overthrown by their subjects and because it brought large numbers of Soviet troops close to Yugoslavia's frontiers. On Nov. 4 the Yugoslav government recognized Janos Kadar's "government." That Tito was not happy was revealed when the press published the text of a speech which he had delivered at Pula on Nov. 11. In this he had condemned the first Soviet military intervention in Hungary (Oct. 24), though he accepted the need for the second intervention (Nov. 4). He also stated that the "cult of personality" was a product of the Soviet system. This provoked an angry reply in *Pravda* on Nov. 19, which claimed that some of Tito's remarks were "a repetition of the previous attacks on the Soviet Union which were fashionable in the past when relations between the U.S.S.R. and Yugoslavia had deteriorated." The kidnapping of Imre Nagy by Soviet forces when he left the Yugoslav embassy in Budapest (Nov. 23) increased tension, though official Yugoslav spokesmen blamed the Kadar "government." Yugoslavia's abstention in the various votes on Hungary in the United Nations and its return of about 100 Hungarian refugees were gestures of appeasement to Moscow. That relations were tense, however, was shown by a speech by Edvard Kardelj (Dec. 8) which said that the second Soviet intervention was justifiable only if it truly united all Socialist forces in Hungary, and truly assured the rights of the working class, "otherwise the act of intervention will be historically condemned."

During 1956 Yugoslavia continued to show great interest in the affairs of the "uncommitted" Asian and African nations. In Dec. 1955 Tito had paid a state visit to Ethiopia, and on his return he visited Pres. Gamal Abdel Nasser in Egypt. A communiqué issued by Tito and Nasser invoked the principles of the 1955 Bandung conference, denounced colonialism and ignored the Arab-Israel issue. In a press interview in Cairo Tito denounced the Baghdad pact. During his state visit to Paris in May, Tito showed interest in French North African affairs. Tito was visited in Brioni by Nasser on July 13-14, and on July 18-19 the two were joined by Jawaharlal Nehru. While they were conferring, a four-man delegation of Algerian nationalists headed by Ferhat Abbas visited near-by Pula. They were received by a Yugoslav foreign ministry official, who promised to hand their memorandum to the three statesmen. The visit ended with a communiqué which repeated the usual Bandung platitudes, but had a special passage on Algeria. In the opinion of the three

statesmen, "colonial domination is wholly undesirable"; they felt "sympathy for the desire of the people of Algeria for freedom"; they recognized that there were in Algeria "considerable numbers of persons of European descent whose interests should be protected, but this should not obstruct recognition of the legitimate rights of the Algerians."

In the Suez canal dispute Yugoslavia strongly supported the point of view of the Soviet and Afro-Asian groups.

(See also HUNGARY; RUMANIA; UNION OF SOVIET SOCIALIST REPUBLICS.) (H. S.-W.)

Education.—Schools (1954-55): primary 14,044, pupils 1,401,608, teachers 36,040; middle and secondary 2,106, pupils 523,076, teachers 21,749; vocational (junior and intermediate) 1,074, pupils 139,825, teachers 12,002; fine arts 159, pupils 17,007, teachers 1,954; teacher training colleges 79, students 20,762, teachers 1,499. Institutions of higher education (1954, including fine arts and physical training) 100 with 59,571 students, out of which 84 university colleges with 57,937 students, 5,195 professors and lecturers. Schools for national minorities (including some of the above with special classes): primary 1,562; middle and secondary 312; teacher training schools 8.

Finance and Banking.—Monetary unit: dinar, with an official exchange rate of 300 dinars to the U.S. dollar. Budget: (1955) balanced at 234,410,000,000 dinars; (1956 est.) balanced at 212,500,000,000 dinars. Currency circulation: (Dec. 1953) 68,050,000,000 dinars; (Dec. 1954) 88,211,000,000 dinars. Bank deposits: (Dec. 1953) 75,730,000,000 dinars; (March 1954) 58,190,000,000 dinars. Foreign exchange holdings: (Dec. 1954) U.S. \$7,930,000; (Dec. 1955) U.S. \$12,580,000.

Foreign Trade.—(1955) Imports 132,287,761,000 dinars; exports 76,976,338,000 dinars. Main sources of imports: U.S. and Canada 33%; Germany 13%; Italy 10%; other continental E.P.U. (European Payments union countries) 18%; sterling area 9%. Main destinations of exports: Germany 13%; Italy 16%; other continental E.P.U. 25%; U.S. and Canada 11%; sterling area 9%. Main exports (1953): lumber 23%; lead 8%; copper 5%; corn 2%.

Transport and Communications.—Roads (1954) 81,619 km. Motor vehicles in use (1954): passenger 11,290, commercial 20,260. Railways (1954) 11,622 km.; passenger-km. (1955) 7,432,000,000; freight, ton-km. (1955) 11,376,000,000. Shipping (July 1955): merchant vessels of 100 gross tons and over 166; total tonnage 300,412. Air transport (1955): passenger-km. 49,644,000; cargo, ton-km. 688,800. Telephones (Jan. 1955) 153,000. Radio receiving sets (1954) 496,811.

Agriculture.—Production (metric tons, 1955; 1954 in parentheses): wheat 2,438,000 (1,385,000); barley 391,000 (253,000); oats 278,000 (233,000); rye 263,000 (191,000); maize 3,900,000 (3,004,000); rice 26,000 (26,000); hemp fibre 53,000 (42,200); potatoes 2,260,000 (1,876,000); sunflower seed 102,000 (125,000); dry peas 11,000 (9,000); beet sugar, raw 154,000 (146,000); tobacco (1954) 29,000, (1953) 30,000; dry beans (1954) 173,000, (1953) 149,000; onions (1954) 147,000, (1953) 152,000. Livestock (Jan. 1956): cattle 5,220,000; sheep 11,518,000; pigs 4,699,000; horses 1,311,000; poultry 26,198,000; goats (Sept. 1953) 621,000. Wine (1954) 2,850,000 hl.

Industry.—Fuel and power (metric tons, 1955): coal 1,137,600; lignite 14,028,000; crude oil 256,200; electricity 4,344,000,000 kw.hr.; natural gas 55,080,000 cu.m.; manufactured gas 25,920,000 cu.m. Production (metric tons, 1955): iron ore (45% metal content) 1,398,000; pig iron 530,400; crude steel 805,200; bauxite 791,017; copper ore 1,476,863; lead-zinc ore 1,650,178; pyrites (concentrate) 226,682; antimony ore 80,474; chrome ore 126,207; manganese 10,955; copper 53,097; lead 75,612; zinc 13,767; aluminum blocks 11,499; cement 1,560,000; cotton yarn 38,167; wool yarn 11,127; wood pulp (mechanical) 27,187, (chemical) 54,948; sawn timber 1,873,000 cu.m.

Yukon Territory. The Yukon Territory, most northerly political division of Canada, was constituted a separate territory by act of parliament in June 1898. The area of the territory is 207,076 sq.mi. (205,346 sq.mi. land and 1,730 sq.mi. water). Population (1951 census) 9,096 (including whites 7,533; Indians and Eskimos 1,563); principal centres (1951 census): Whitehorse (capital), 2,594; Dawson, 783; Mayo, 241. Commissioner in 1956, F. H. Collins.

History.—This area remained a centre of interest during 1956, following plans made by the Frobisher-Ventures interests in 1954 to establish a metallurgical and electrochemical industry in northern British Columbia, which included a plan to divert the water of the Yukon through a chain of storage lakes, making it flow southward into Taku river, British Columbia. The Aluminum Company of America (Alcoa) had already spent millions of dollars surveying a scheme that would dam the Yukon's headwaters and turn part of them through the Alaskan panhandle by tunnel to the sea at Taiya, near Skagway, where the largest aluminum industry in the world would be built on U.S. territory. Alcoa expected Canada to allow the alienation of the Yukon river, but the Canadian government rejected the ambitious scheme and the projected development of the panhandle as a great industrial area.

collapsed. At the same time the Frobisher-Ventures project was deadlocked until such a time as the United States and Canadian governments could arrive at some mutual agreement regarding the diversion of Yukon waters and a possible amendment of the Boundary Waters treaty of 1909.

Education.—In 1955 the territory had 16 public schools with 59 teachers and 1,554 pupils. The amount spent on education in 1955-56 was \$482,608.

Communications.—There were 58 mi. of railway in 1956. The Yukon river is 1,979 mi. long, of which 1,777 mi. are navigable (570 mi. within Yukon Territory), offering communication from the end of the railway at Whitehorse to Dawson, but commercial river transportation is no longer available. There were (1955) 1,675 mi. of motor roads and secondary roads, in addition to the Alaska highway, which enters Yukon Territory at Mile 620 and crosses the international boundary into Alaska at Mile 1,221. Commercial air lines provide passenger and express services daily between Vancouver and Whitehorse, and Edmonton and Whitehorse. These services, which extend to Fairbanks, Alsk., connect with transcontinental air lines at Edmonton and Vancouver. A twice-weekly service is maintained from Whitehorse to Mayo and Dawson.

Finance.—Territorial expenditures during 1955 (in Canadian dollars) amounted to \$1,753,660; revenue, \$2,073,062.

Production and Industry.—Mining is the principal occupation. Output in 1955 was: gold, 74,380 fine oz. valued at \$2,567,895; silver, 5,523,165 fine oz., \$4,963,005; lead, 25,760,986 lb., \$3,704,430. The total value of mineral production in 1955 was \$14,406,158, including cadmium and zinc.

Furs and Game.—The fur yield for the year ending June 30, 1955, totalled 213,515 pelts valued at \$242,944. Squirrel, muskrat, beaver and marten constituted the major part of the catch. (P. H. GL.)

ENCYCLOPEDIA BRITANNICA FILMS.—*Pacific Canada* (1943).

Zanzibar: see BRITISH EAST AFRICA.

Zinc. The data on zinc were compiled from U.S. bureau of mines reports. Table I gives the chief producers of world supplies of smelter zinc for the years 1949-55.

United States.—In 1955 the U.S. continued as the world's largest producer and consumer of zinc. Although output of domestic recoverable zinc, as shown in Table II, was considerably greater than in 1954, it was still below the 1946-55 average of 592,000 tons. Slab zinc output and consumption attained an all-time high. Imports of slab zinc were 15% greater than in 1954, and imports of zinc in ore and concentrates were 4% greater. The recoverable zinc was mined in the following areas: western states, 55%; states east of the Mississippi, 32%; and west central states, 12%.

Table I.—World Smelter Production of Zinc

	(In thousands of short tons)					
	1949	1950	1951	1952	1953	1954
Australia	90.7	93.7	86.3	97.9	101.0	117.1
Belgium	194.6	195.5	221.4	205.9	213.2	234.5
Canada	206.0	204.4	218.6	222.2	250.9	213.8
France	66.8	78.9	82.2	88.3	89.2	122.2
Germany	95.8	135.4	155.0	162.3	163.4	184.8
Great Britain	71.8	78.7	78.1	77.0	81.4	91.0
Italy	29.7	41.8	52.3	60.5	66.2	74.4
Japan	35.6	54.0	62.1	77.2	85.0	111.7
Mexico	59.0	59.0	64.8	55.5	58.5	60.5
Netherlands	17.2	21.8	24.9	28.6	27.8	28.7
Northern Rhodesia	25.6	25.4	25.3	25.6	28.4	29.7
Norway	45.2	47.6	45.0	43.2	42.8	48.8
Poland	94.9	95.9	125.9	132.9	152.9	157.9
Spain	21.6	23.4	23.5	23.5	25.5	25.7
U.S.S.R. (est.)	121.0	142.0	182.9	226.9	279.9	303.9
United States	814.8	843.5	881.6	904.5	916.1	802.4
Total	2,133	2,170	2,360	2,470	2,640	2,710

Table II.—Data of Zinc Industry in the U.S.

	(In thousands of short tons)					
	1949	1950	1951	1952	1953	1954*
Mine production	593.2	623.4	681.2	666.0	547.4	473.5
Smelter production	814.8	843.5	881.6	904.5	916.1	808.0
Domestic ores	591.5	588.3	621.8	575.8	495.4	410.0
Foreign ores	223.3	255.2	259.8	328.7	420.7	398.0
Imports	367.8	434.5	390.9	565.3	748.0	612.0
In ore	241.2	278.6	302.9	449.6	513.4	445.0
Metal	126.9	156.0	88.0	115.7	234.6	150.0
Secondary recovery	237.8	326.0	314.4	310.4	294.7	271.8
Stocks	176.0	73.1	72.6	177.3	265.9	224.9
Producers'	94.2	8.9	22.0	85.0	180.0	123.0
Consumers'	81.8	64.2	50.6	92.3	85.7	101.9
Consumption	711.8	967.1	934.0	852.8	985.9	884.4

*Revised. †Preliminary.

In the first eight months of 1956, output was as follows: recoverable zinc, 359,076 tons; smelter (according to American Zinc institute) 689,184 tons; and secondary recovery, 98,366 tons. (F. E. H.; B. B. M.)

Zonta International: see SOCIETIES AND ASSOCIATIONS, U.S.

Zoology. Animal biology encompasses a large number of independent or semi-independent disciplines. When viewing a broad topic such as zoology one must keep in mind that the really important advances, with application to this subject, may have occurred in quite distant fields. The nature of zoology is such that sudden changes seldom occur; rather, there are periods of shifting emphasis and reorganization of subject matter. The year 1956 was characterized more by the indications of the need for changes than by any actual change. The emphasis was on function rather than structure, on experimental analysis rather than description.

Morphology.—There was a steady growth of knowledge concerning the comparative anatomy of vertebrates. This growth had resulted mainly from the efforts of a few Scandinavians over the preceding ten years and was centred around the study of fossil forms. To interpret and understand the fossils, living forms received renewed attention. Important contributions to existing knowledge of the origin of the vertebrates resulted from detailed studies by Stensiö, Säve-Söderberg, Nielson and Jarvik. The latter described the branchial skeleton of *Eusthenopteron*, thus greatly increasing the knowledge of the Crossopterygii, an important group as regards the origin of the tetrapods. It was hoped that studies of the chondrocranium of the ichthyostegids, perhaps the earliest amphibians, would be forthcoming.

The results of anatomical study of the several specimens of coelacanths (*Latimeria*) in the possession of Millot of Paris were awaited by the zoological world. This was the first time that a "fossil" had been studied in the flesh (at least one that was 50,000,000 years old). The prevalent feeling of excitement stemmed not from the assumption that this fish was close to the tetrapod stem but rather from the hope that expansion of general knowledge would indicate more about this stem. The preliminary account by J. L. B. Smith (*The Search Beneath the Sea*, New York, 1956) indicated that this creature, like the teleosts, has a high level of aquatic specialization and has abandoned or converted many of its primitive features to specialized ones.

Palaeontology again made an important contribution to morphology with the publication of A. S. Romer's *The Osteology of the Reptiles*. Some of the controversy regarding the homology of

VETERINARIAN OF CINCINNATI, O., ZOO attempting to inject wounded tiger with hypodermic as the animal superintendent holds the animal's tail. The tiger, a Bengal male, was attacked by two females in Sept. 1956 and, despite efforts of the zoo officials, died



skull bones was eliminated with a review of the skull in this group. Twenty years had passed since the publication of Westoll's association of the pineal eye with the parietal bones, yet a workable solution to this problem had not been forthcoming.

Worthy of note was Sir Gavin de Beer's summary of knowledge concerning *Archaeopteryx lithographica* (London, 1954). Views concerning the origin of birds seemed to be crystallizing. There was a certain reluctance to view this feathered reptile as anything other than a bird (if lost to the ornithologist, what fossil could replace it?). Somewhat in contradiction to the assumed avian character of these remains is the idea that feathers are associated with maintenance of a high body temperature, as is also the four-chambered heart, and that these must have preceded the acquisition of flight.

Zoologists also contributed to morphology. The new serial publication by Marinelli and Strenger titled *Vergleichende Anatomie und Morphologie* (Vienna) planned to cover in detail the anatomy and development of representative species (12 in all) of the different classes of vertebrates. Many short articles on various anatomical details appeared during the year in the various journals. One of the unfortunate aspects of this type of publication is the scattering of the various contributions. The bibliographic effort required to locate accounts too frequently exceeds their real value.

Not only had existing knowledge of the anatomy of key vertebrates grown, but also that concerning certain invertebrate groups. The translation of Ivanov's description of the Pogonophora, by Petrunkevitch (1955), can be cited along with the, as yet, not realized reaction to Hadzi's conclusions that the Coelenterata are not primitive stem types but rather secondarily developed sessile forms.

The Pogonophora are close to the Enteropneusta and represent another very simple prechordate or chordate group. Use of the term "simple" here brings up the controversy of whether simplicity in many organisms (Protozoa, Coelenterata, Archiannelida) is degeneration or retention of a primitive plan. Resort to degeneration is much too common (carried so far as to say that viruses are disassociated genes and rickettsias are mitochondria with associated deoxyribonucleic acid). The use of life histories to prove degeneration is not particularly satisfying unless the evidence is very clear; in any case, there has been a general feeling of rejection of the biogenetic law (we now talk about palaeogenesis). The present decurrently branched tree of invertebrates no longer seems to be consistent with the central importance of a flatwormlike ancestor for all Eumetazoa.

Embryology.—The development of animals frequently gives important aid in the determination of interrelationships between groups as well as supplying information on mechanisms of growth and differentiation. Both lines of study are pursued with the latter receiving the greater attention. The lack of information available to the morphologist or taxonomist on the development of some of the more critical vertebrate or invertebrate types is surprising. For example, it has been suggested that the phylum Brachiopoda is made up of two unrelated types, yet the developmental picture is not really adequate to support strong argument. Filling gaps in the information concerning the invertebrates were the developmental studies by Sachs (gastrotrichs) and Rattenbury (phoronid). The fertilization process of a sponge was finally worked out in detail by Odette Tuzet.

The vertebrates were recipients of the attention of Emil Witschi (*Development of Vertebrates*, Philadelphia, 1956). Work with marsupials in Australia indicated that some of the usual textbook information relative to reproductive physiology is not generally applicable to all mammals. The development of the skull in various fishes, fundamentally the relationship between dermal plates and sensory organs of the lateral line system, at-

tracted some attention and posed many problems. The embryology of the hagfishes was still known only superficially and was in need of detailed study.

Ecology and Behaviour.—A new dimension was given ecological research by Howard T. Odum's application of the entropy concept. Entropy had been used in the physical sciences and its application to life was followed by rapid adoption. However, its relationship to "primary productivity" and "efficiency" in communities may be somewhat difficult to grasp. An older, simpler topic of ecological investigation involved populations. B. P. Uvarov (Locust Control centre, Oxford) studied the sequential nature of population build-ups in locusts which lead to changes in form and behaviour of the animals and in the outpouring of hordes from the area of origin.

The population growth of man again received attention from Karl Sax in *Standing Room Only: the Challenge of Over-population* (Boston, 1955).

The behaviouristic aspect of zoology received several generous contributions. Konrad Lorenz (*Man Meets Dog*, Boston, 1955) revealed much about "man's best friend." Building on such blocks as this, W. H. Thorpe (*Learning and Instinct in Animals*, Cambridge, Mass., London, 1956) summarized the general ideas of the behaviour of all kinds of animals from the protozoa to the mammals. Heini Hediger (*Studies of the Psychology and Behaviour of Captive Animals in Zoos and Circuses*, London, 1955) detailed points of interest regarding some of the larger and showier mammals, types which are particularly difficult to study in the field (here, one cannot help recall Verheyen's study of the hippopotamus in the Congo).

The reporting of ideas on behaviour took a new slant in two volumes on *Group Processes* sponsored by the Macy foundation and edited by Bertram Schaffer (Madison, N.J., 1955 and 1956). Papers presented before a panel of experts were critically evaluated while being presented; paper, questions, answers and comments were recorded just as they transpired. The result was a condensation of views, a broad coverage of ideas which was refreshingly different.

Taxonomy, Biogeography and Natural History.—Knowledge of birds was reviewed in *Recent Studies in Avian Biology*, edited by Albert Wolfson (Urbana, Ill., 1955). Separate articles considered each facet of subject matter from migration to physiology; and made important contributions to several aspects of general zoology. Regarding birds, there was a return to the controversy of the reality of the palaeognathae versus the neognathae. Although some aspects of this were reported by Hofer (*Acta XI Congressus Internationalis Ornithologici Basel*) and Nils Holmgren, the over-all problem had not been reviewed.

The taxonomic study of fishes was being carried on by numerous osteological studies (Ramaswami and others). The translation of Klaus and Deckert (*Creatures of the Deep Sea*, New York, 1956) brought the deep-sea fishes up to the average reader.

Another aspect of the sea and of fish life was the study of plankton. This was described by A. C. Hardy (*The Open Sea, the World of Plankton*, New York, 1956). The beauty and interest of the minute animals making up this stuff called "plankton" leaves one searching for adjectives.

(See also ENDOCRINOLOGY; GENETICS; MARINE BIOLOGY; PALAEONTOLOGY; PHYSIOLOGY.) (M. J.)

ENCYCLOPÆDIA BRITANNICA FILMS.—*Ants* (1948); *Beach and Sea Animals* (1931); *Beetles* (1931); *Crustaceans* (Lobsters, Barnacles, Shrimp and Their Relatives) (1956); *The Frog* (1931); *Grouse of the Grasslands* (1950); *Honeybee* (1940); *Life Along the Waterways* (1952); *Life in the Desert* (1954); *Life in the Forest* (1955); *Life in the Grasslands* (1954); *Marine Life* (1953); *Mollusks* (Snails, Mussels, Octopuses, and Their Relatives) (1955); *Monarch Butterfly Story* (1951); *Mosquito* (1947); *Pond Life* (1950); *Reptiles* (1955); *Seashore Life* (1950); *Snapping Turtle* (1940); *Spiders*, 2nd ed. (1956); *Sunfish* (1941); *Sunrise Serenade* (1950); *Water Birds* (1945); *Worms* (The Annelida) (1955).

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